

## **Annex A. Traffic Survey**

### **A.1 Introduction**

As a part of Pakistan Transport Plan Study (PTPS), JICA Study Team has conducted a traffic survey through out the country. The major component of the traffic survey was a Roadside O/D (Origin-Destination) Interview Survey at 100 sites.

There are several Origin-Destination Surveys carried out in Pakistan. The first country-wide OD survey was carried out in 1968-69 by the then Transport Planning Cell of the Government of West Pakistan as part of West Pakistan Transport Coordination Project (TRACO Study). It was based on zoning at divisional level with 34 interview points only covering main part of the country. The survey formed bases of the Third Five Year Plan.

The next country-wide OD Survey was carried out by National Transport Research Centre (NTRC) from July 1979 to November 1980. During this period, two rounds of the survey were carried out at 110 places on the main roads all over the country. The result was used for the National Transport Planning Study (NTPS) by JICA (1983) for the sixth Five Year Plan. The data was updated by JICA in 1988 for the seventh Five Year Plan.

The third OD Survey was carried out by NTRC from 13 January, 1990 to 9 February, 1991 completing three rounds at 65 locations of which 62 were surveyed in the first round, 16 in the second round and 55 in the third round. The data was used in “the Study on National Transport Plan in the Islamic Republic of Pakistan, February 1995, JICA” for the Eighth Five Year Plan. Since then, no country-wide OD survey has been conducted.

Therefore, the Roadside O/D Interview Survey in PTPS was the fourth county-wide O/D Survey in Pakistan, and the first O/D Survey carried out by JICA.

### **A.2 Objectives**

Traffic Survey was conducted for following purposes:

- To make vehicle O/D matrices of all over Pakistan for inter-district transport,
- To analyze characteristics of motor-vehicle traffic on major roads,
- To analyze characteristics of passenger transport,
- To analyze characteristics of freight transport, and
- To analyze international transport

The future traffic demand for the PTPS Master Plan was projected based on the vehicle O/D matrices made from the Traffic Survey.

### **A.3 Survey Design**

#### **A.3.1 Survey Types**

Surveys were conducted through sub contracting a survey company in Pakistan. Survey details including type and scope were finalized through long discussions with the Study Team and NTRC. The following traffic surveys were arranged.

**Table A-1 Survey Types**

<b>Category</b>	<b>Survey</b>	<b>Nos.</b>
O/D Survey	Roadside OD Interview Survey (RIS)	100
	Cargo O/D Survey at Dry Depots	10
Manual Classified Traffic Count Survey (MCC)	24 hours Traffic Count	17
	16 hours Traffic Count	83
	Three days Traffic Count (one day 24hours and two days 16hours)	6
	Detailed Truck Classification Survey	(4)
	Cross-border Traffic Count Survey	5
Passenger Transport Survey	Long-distance Bus Survey	10
	Passenger Interview Survey at Railway Stations	5
	Passenger Interview Survey at Airport	5
	Passenger Interview Survey at Bus Terminal	5

The field work was started on 19th of August 2005 and completed on 17th September 2005.

### **A.3.2 Survey Schedule**

Various project activities for PTPS were initiated simultaneously as the preparation of master plan proceeded; therefore traffic survey was conducted in parallel with other project activities and in a relatively short period of time. As per agreed schedule field work was to be finalized in July & August 2005 and all the data and reports were to be completed in September 2005, however, due to unavoidable circumstances work was completed in last week of October 2005.

### **A.3.3 Survey Location**

The survey locations of the Roadside O/D Interview Survey (RIS) were originally selected on the major roads crossing boundaries of the traffic zones in the NTPS (1995-06). However, it turned out that some boundaries had many crossing points, and it was difficult to make cordon lines that corresponded to the traffic zone boundaries. Therefore, some traffic zones were merged so that the all zones could be bordered by cordon lines. Figure A-1 shows the final survey locations. Traffic count survey was carried out together with the RIS.

# PTPS Survey Location Map

## Pakistan Transport Plan Study

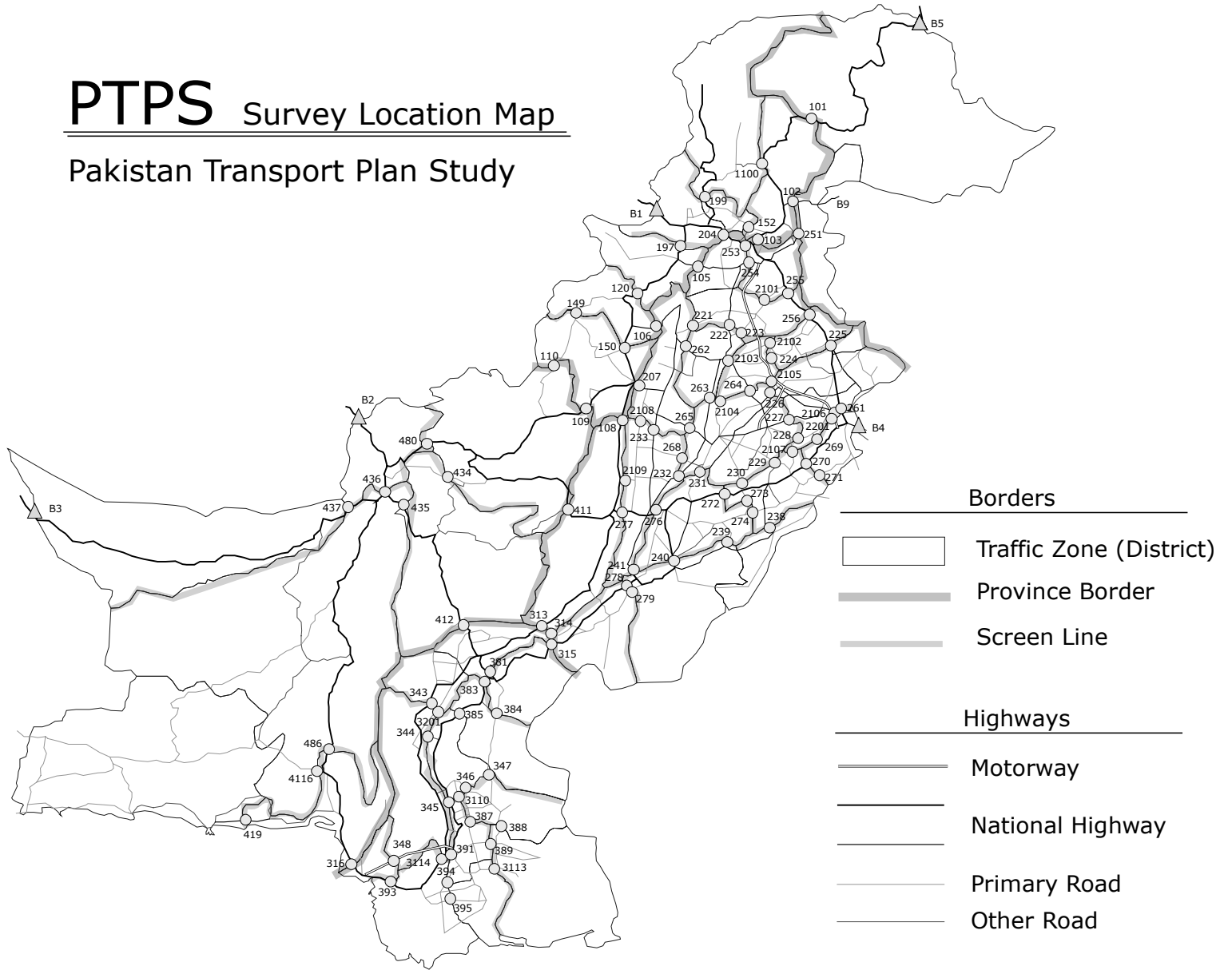


Figure A-1 Survey Location Map

**Table A-2 Table List of Survey Sites (1)**

Code	District-A	District-B	Road Section	Date*1	Day	Type
101	Kohistan	Northern Areas	N35 (Dasu – Challas)	23-Aug	Tue.	
102	Mansehra	Muzaffarabad	Mansehra – Muzaffarabad	26-Aug	Fri.	
103	Rawalpindi	Haripur	N35 (Hassanabdal – Haripur)	27-Aug	Sat.	
105	Attock	Kohat	Kushargarh Bridge	30-Aug	Tue.	A
106	Mianwali	Lakki Marwat	N60 (Isa Khel – Lakki)	06-Oct	Thu.	A
108	D. I. Khan	D. G. Khan	N55 (D.I.Khan – Taunsa)	10-Sep	Sat.	
109	South Waziristan	Zhob	N55 (D.I. Khan – Zhob)	08-Sep	Thu.	
110	South Waziristan	Zhob	Gul Kach Milita Post	05-Sep	Mon.	
120	Karak	Bannu	N55 (Karak – Bannu)	01-Sep	Thu.	
149	North Waziristan	South Waziristan	Razmak – Tanai Scout Post	03-Sep	Sat.	
150	Lakki Marwat	D. I. Khan	N55 (Lakki – D.I.Khan)	06-Sep	Tue.	
152	Haripur	Sawabi	Haripur – Sawabi	17-Sep	Sat.	
197	Peshawar	Orakzai Agency	N55 (Peshawar – Kohat)	29-Aug.	Mon.	
199	Mardan	Malakand	N45 (Mardan – Malakand)	20-Aug	Sat.	
1100	Kohistan	Shangla	Beshham – Khaweza Khel	22-Aug	Mon.	
204	Attock	Nowshera	N5 (Attock – Nowshera)	06-Sep	Tue.	B
207	Bakkar	D. I. Khan	Darya Khan – D. I. Khan	30-Aug	Tue.	A
221	Chakwal	Minwali	P116 (Talagang – Musa Khel)	31-Aug	Wed.	
222	Chakwal	Kushab	P101 (Talagang – Khusab)	31-Aug	Wed.	A
223	Chakwal	Kushab	P103 (Kallar Kahar – Khushab)	01-Sep	Thu.	
224	Mandi Bahaudin	Sargodha	P122 (Gojra – Bhalwal)	02-Sep	Fri.	
225	Gujrat	Gujranwala	N5 (Gujrat – Wazirabad)	10-Sep	Sat.	B
226	Hafizabad	Jahang	P132 (Pindi Bhattian – Chiniot)	22-Aug	Mon.	A
227	Sheikhupura	Faizalabad	P142 (Shekhupura – Faizalabad)	20-Aug	Sat.	B
228	Sheikhupura	Faizalabad	P144 (Lahore – Jaranwala)	20-Aug	Sat.	
229	Okara	Faizalabad	P143 (Okara – Samundri)	27-Aug	Sat.	
230	Sahiwal	T. T. Singh	P161 (Chichawatni – T. T. Singh)	29-Aug	Mon.	
231	Jhang	Khanewal	P165 (Shorkot – Sarai Sidhu)	03-Sep	Sat.	
232	Jhang	Muzaffargarh	P151 (Garh Maharaja – Rangpur)	05-Sep	Mon.	A
233	Bhakkar	Layyar	P185 (Bhakkar – Leiah)	29-Aug	Mon.	B
238	Pakpatan	Bahawalnagar	P145 (Arifwala – Bahawalnagar)	01-Sep	Thu.	
239	Vehari	Bahawarpur	P171 (Vehari – Hasilpur)	01-Sep	Thu.	
240	Lodhran	Bahawarpur	N5 (Lodhran – Bahawarpur)	07-Sep	Tue.	
241	Muzaffargarh	Bahawarpur	P183 (Alipur – Uch Sharif)	10-Sep	Sat.	
251	Rawalpindi	Muzaffarabad	Murree – Muzaffarabad	06-Sep	Tue.	
253	Rawalpindi	Attock	N5 (Taxila – Burhan)	05-Sep	Mon.	
254	Rawalpindi	Attock	N80 (Tarnol – Fatehjang)	05-Sep	Mon.	
255	Rawalpindi	Jhelum	N5 (Gujar Khan – Dina)	03-Sep	Sat.	
256	Jhelum	Gujrat	N5 (Jhelum – Kharian)	08-Sep	Thu.	
261	Sheikhupura	Lahore	N5 (Muridke – Lahore)	12-Sep	Mon.	
262	Mianwali	Khushab	P136 (Mianwali – Khushab)	30-Aug	Tue.	
263	Khushab	Jhang	P151 (Khushab – Atharan Hazari)	27-Aug	Sat.	
264	Sargodha	Jhang	P147 (Sargodha – Chenab Nagar)	24-Aug	Wed.	
265	Bakkar	Jhang	P144 (Bakkar – Atharan Hazari)	27-Aug	Sat.	
268	Layyar	Jhang	P168 (Chaubara – Garh Maharaja)	03-Sep	Sat.	
269	Sheikhupura	Kasur	Morekhunda – Bhai Pheru	22-Aug	Mon.	
270	Kasur	Okura	N5 (Pattoki – Okura)	24-Aug	Wed.	
271	Kasur	Okura	P139 (Kasur – Hujra Shah Meqeem)	23-Aug	Tue.	
272	Shalwal	Khanewal	N5 (Chichawatni – Mian Channun)	02-Sep	Fri.	
273	Shalwal	Vehari	P173 (Mian Channun – M. Burewala)	30-Aug	Tue.	

**Table A-2 Table List of Survey Sites (2)**

Code	District-A	District-B	Road Section	Date*1	Day	Type
274	Pakpattan	Vehari	P139 (M. Burewala – Vehari)	31-Aug	Wed.	
276	Multan	Muzaffargarh	N70 (Multan – Muzaffargarh)	06-Sep	Tue.	
277	Muzaffargarh	D. G. Khan	N70 (Muzaffargarh – D. G. Khan)	06-Sep	Tue.	B
278	Bahawalpur	Rahim Yar Khan	N5 (Uch Sharif – T. M. Panah)	08-Sep	Thu.	
279	Bahawalpur	Rahim Yar Khan	P181 (Ahmadpur East – Liaquatpur)	10-Sep	Mon.	
2101	Rawalpindi	Chakwal	P103 (Mandra – Chakwal)	03-Sep	Sat.	
2102	Mandi Bahaudin	Sargodha	P124 (Miani – Bhora)	02-Sep	Fri.	
2103	Sargodha	Khushab	P136 (Shahpur – Khushab)	01-Sep	Thu.	
2104	Sargodha	Jhang	P149 (Sahiwal – Jhang)	26-Aug	Fri.	
2105	Sargodha	Hafizabad	P136 (Sargodha – Pindi Bhattian)	23-Aug	Tue.	
2106	Sheikhupura	Lahore	P136 (Sheikhupura – Lahore)	19-Aug	Fri.	
2107	Sheikhupura	Okara	Jaranwala – Okara	26-Aug	Fri.	
2108	Bhakkar	Layyar	P185 (Bhakkar – Layyar)	29-Aug	Mon.	
2109	Layyar	D. G. Khan	Kot Addu – Shadan Lund	05-Sep	Mon.	
2201	Lahore	Sheikupura	Ravi Bypass	12-Sep	Mon.	
313	Rajanpur	Jacobabad	N55 (Rojhan – Kashmor)	10-Sep	Sat.	A
314	Rahim Yar Khan	Jacobabad	Rahimyar Khan – Kashmor	12-Sep	Mon.	
315	Rahim Yar Khan	Ghotki	N5 (Saiqabad – Ubauro)	08-Oct	Sat.	A
316	Karachi	Utal Laasbera	N25 (Hub)	05-Sep	Mon.	B
343	Larkana	Dadu	N55 (Kambar – Mehar)	10-Sep	Sat.	
344	Dadu	Naushanro Firoz	Badhan – Dadu	22-Aug	Mon.	
345	Nawabshah	Hyderabad	N5 (Sakrand – Hala)	27-Aug	Sat.	
346	Nawabshah	Sanghar	S34 (Nawabshah – Sanghar)	27-Aug	Sat.	
347	Khairpur	Sanghar	S28 (Sorah – Jamaro Head)	27-Aug	Sat.	
348	Karachi	Dadu	M9 (Karachi – Hyderabad)	03-Sep	Sat.	
381	Sukkur	Shikarpur	N65 (Sukkur – Shikarpur)	12-Sep	Mon.	
383	Sukkur	Khairpur	N5 (Rohri – Khairpur)	12-Sep	Mon.	
384	Sukkur	Khairpur	S28 (Rohri – Sorah)	19-Aug	Fri.	
385	Khairpur	Naushanro Firoz	N5 (Kot Diji – Kandiaro)	20-Aug	Sat.	
387	Sanghar	Hyderabad	S55 (Tando Adam – Tando Allahyar)	29-Aug	Mon.	
388	Sanghar	Mirpur Khas	S34 (Sindhri – Mirpur Khas)	29-Aug	Mon.	
389	Hyderabad	Mirpur Khas	S60 (Tando Allahyar)	30-Aug	Tue.	
391	Hyderabad	Thatta	N5 (Hyderabad – Kotri)	01-Sep	Thu.	
393	Thatta	Karachi	N5 (Thatta – Karachi)	06-Oct	Fri.	A
394	Hyderabad	Thatta	S87 (T. M. Khan – Mirpur Batoro)	02-Sep	Fri.	
395	Thatta	Badin	S87 (Thatta – Sujawal)	31-Aug	Wed.	
3110	Nawabshah	Sanghar	S55 (Nawabshah – Shahdadpur)	23-Aug	Tue.	
3113	Badin	Mirpur Khas	Tando Bago - Digri	30-Aug	Tue.	
3114	Dadu	Thatta	N55 (Kotri – Thatta)	01-Sep	Thu.	
3201	Larkana	Dadu	Badrah – Dadu	10-Sep	Sat.	
411	D. G. Khan	Barkhan	N70 (D. G. Khan – Rakhni)	30-Aug	Tue.	A
412	Jacobabad	Jhatpat	N65 (Jacobabad – Jhatpat)	08-Sep	Thu.	B
419	Utal Lasbera	Gwadar	N10 (Malan – Ormara)	05-Sep	Mon.	
434	Ziarat	Loralai	Sanjawi – Lowalai	01-Sep	Thu.	
435	Mastung	Sibi	N65 (Bolan Pass)	06-Sep	Tue.	
436	Quetta	Mastung	N25 (Lak Pass – Mastung)	03-Sep	Sat.	
437	Quetta	Chagai	N40 (Lak Pass – Nushki)	05-Sep	Mon.	
480	Killa Saifullah	Pishin	N50 (Hindubagh – Quetta)	02-Sep	Fri.	
486	Khuzdar	Utal Lasbera	N25 (Khuzdar – Bela)	06-Oct	Thu.	A
4116	Utal Lasbera	Awaran	Bela – Lak Chauki	07-Sep	Wed.	

\*1: The date of the Roadside O/D Interview Survey

### A.3.4 Survey Contents

#### (1) Roadside O/D Interview Survey (RIS)

Motor vehicles, excluding motorcycles and rickshaws, were flagged down by polices and the drivers were interviewed.

##### a) Survey Time

The survey time of each survey site was planned to be 16 hours from 6:00 to 22:00.

However, there are some survey sites where the survey started at 7:00 due to delay of police arrival. Because police cooperation is inevitable for RIS, it could not be conducted without the presence of police.

##### b) Vehicle Classification

The vehicle classification applied in the RIS was:

Vehicle Category	Vehicle Type
Motor Cycle	1) Motor Cycle (traffic count only)
Car	2) Car (Passenger car, pickup, van, and taxi and 4WD)
Bus	3) Minibus (up to 12 seats)/ Medium bus (12 to 40 seats) 4) Large bus (40 and above seats)
Truck	5) Pick-up truck (open back with single or twin cabin) 6) 2-axle truck 7) 3 or more -axle truck/Dump/Trailer 8) Container truck/Container trailer 9) Agriculture tractor with or without trolley or Trailer

##### c) Interview Items

The collected information from the interview according to the vehicle category was follows:

Vehicle Category	Interview items
Car	Origin, Destination, Number of occupants, Trip purpose at origin and destination
Bus	Origin, Destination, Number of passengers, Bus type
Truck	Origin, Destination, Cargo type including break-bulk category. Tonnage of cargo. Truck type

##### d) Sampling Rate

Target sampling rate was set at over 10%.

However, there are many sites where the sampling rate exceeds 30% or 40% due of low traffic volume. On the other hand, several survey sites at heavy traffic roads barely achieved the target sampling rate.

#### (2) Manual Classified Traffic Count (MCC) Survey

Motor vehicles by vehicle type by direction were counted hourly by enumerators manually.

##### a) Survey Date and Time

As to survey date and time, there are two types of MCC Survey as follows:

<b>MCC Type</b>	<b>Survey Time</b>
16 hours traffic count	6:00 – 22:00
24 hours traffic count	6:00 – 6:00 on the next day
Three days traffic count	One day of 24 hours traffic count (6:00 – 6:00 on the next day) Two days of 16 hours traffic count (6:00 – 22:00)

There are some sites where the counting started at 7:00 and ended at 23:00 because of the delay of police arrival.

**b) Vehicle Classification**

The vehicle classification applied in the MCC Survey is the same as that of RIS.

Meanwhile, NTRC requested to detail the classification of trucks in the first seminar held on 17 August. The Study Team agreed to carry out Detailed Truck Classification Survey at 4 selected sites (345, 382, 435, and 486), according to the following classification:

- 1) Motor Cycle (traffic count only),
- 2) Car (Passenger car, pickup, van, and taxi and 4WD),
- 3) Minibus (up to 12 seats)/ Medium bus (12 to 40 seats),
- 4) Large bus (40 and above seats),
- 5) 2-axle truck,
- 6) 3-axle truck,
- 7) 4-axle truck,
- 8) 5-axle truck, and
- 9) 6-axle truck

**(3) Cargo O/D Survey at Inland Container Depot (ICD)**

Trucks, exiting from and entering into Inland Container Depots, were counted manually, and parts of them were interviewed at the gate.

**a) Survey Time**

The survey time of each survey site was planned to be 12 hours from 6:00 to 18:00. If operating time of ICD was shorter than 12 hours, the survey time shortened to meet with the operating duration.

**b) Vehicle Classification**

The vehicle classification for the counting is the same as that of RIS.

**c) Interview Items**

The collected information from the interview was: Origin or Destination, loaded volume, cargo type, truck capacity and travel time.

**(4) Cross-border Traffic Count Survey**

Motor vehicles were counted at five international boarders by enumerators manually, and some trucks were interviewed.

**a) Survey Time**

The survey time of each survey site was planned to be 12 hours from 6:00 to 18:00.

**b) Vehicle Classification**

The vehicle classification for the counting is the same as that of RIS.

c) Interview Items

The collected information from the interview was: Origin or Destination, loaded volume, cargo type, and travel time.

**(5) Passenger Interview Survey**

Passengers of buses, trains and airplanes were interviewed at bus terminals, railway stations, and airports, respectively.

a) Survey Time

The survey time of each survey site was planned to be 12 hours from 6:00 to 18:00.

b) Interview Items

The collected information from the interview was: occupation, income level, origin or destination, trip purpose and transport mode from/to the survey sites.

c) Sampling

The number of interviewees was over 200 at each site.

**(6) Long-distance Bus Survey**

Bus routes, fare structure and other operational information were surveyed by interviewing bus drivers or operators at bus terminals.

a) Interview Items

The collected information was: ownership, destination, journey time, frequency, fare structure, and bus occupancy.

b) Sampling

The minimum sampling number was 100 at each bus terminal.

## **A.4 Survey Preparation**

Before the commencement of the field work preparatory activities were undertaken to ensure smooth conduct of survey through performing following activities.

### **A.4.1 Program Plan**

A Program Plan was prepared by the sub-contractor and approved by the JICA Study Team before starting the traffic survey. The Program Plan included:

- Work organization with names, telephone & facsimile numbers and addresses of key personnel of the survey teams,
- Work Schedule,
- Instructions Manual for survey supervisors and field staff,
- Staffing Schedule, and
- Survey Field Staff Training

In addition to above subcontractor was assisted through provision of detailed maps of survey locations and zone plan indicating codes for each district.



#### **A.4.2 Police Assistance**

Police assistance for conducting RIS was arranged utilizing Government channels. National Highways/Motorways Police was mobilized for N-5 whereas Provincial Highways Police assisted for survey on remaining road network. Police presence in Punjab was remarkable, whereas for other provinces, the sub-contractor used its own contacts and efforts for the arrangement of police at survey sites.

#### **A.4.3 Survey Sheets**

Survey sheets were designed by the JICA Study Team, further discussed and agreed upon with NTRC to make the survey more appropriate.

The following six survey sheets are attached from the next page:

- Roadside O/D Interview Survey
- Manual Classified Traffic Count Survey
- Inland Container Depot Survey
- Cross-border Survey
- Passenger Interview Survey
- Long-distance Bus Survey

Pakistan Transport Plan Study - JICA		Road Side Interview Survey Form (RIS 1.0)																					
Survey Site (Location) _____	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 1 2 3 4	Date _____	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 6 7 8 9 10 11																				
Survey Direction (From) _____		Day _____	<input type="text"/> 12																				
To _____	<input type="text"/> 5	Time (Hour Beginning) _____	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 13 14 15 16																				
<b>VEHICLE TYPE</b>		<b>VEHICLE TYPE 2</b>																					
2 Car/Jeep/Taxi/Pickup/4WD 3 Mini Bus/Medium Buses (un to 20 seats) Toyota Hiace Transit Vehicle with 12 to 18 seats 4 Large Bus (Over 20 seats) 5 Pickup - Truck Open Back Single / Double Cabin 6 2-Axle Truck (Rigid) 7 3-Axle Truck (Rigid) 8 Articulated Vehicles 4,5,6 or more Axles 9 Agriculture Tractor / Trolley		<b>What is the Purpose there?</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:50%;">Origin</th> <th style="width:50%;">Destination</th> </tr> </thead> <tbody> <tr><td>1 Home</td><td>1 Home</td></tr> <tr><td>2 Work</td><td>2 Work</td></tr> <tr><td>3 Business</td><td>3 Business</td></tr> <tr><td>4 Education</td><td>4 Education</td></tr> <tr><td>5 Shopping</td><td>5 Shopping</td></tr> <tr><td>6 Recreational/Leisure</td><td>6 Recreational/Leisure</td></tr> <tr><td>7 Visit Relatives</td><td>7 Visit Relatives</td></tr> <tr><td>8 Others</td><td>8 Others</td></tr> <tr> <td style="text-align: center;"><input type="text"/> 33</td> <td style="text-align: center;"><input type="text"/> 34</td> </tr> </tbody> </table>		Origin	Destination	1 Home	1 Home	2 Work	2 Work	3 Business	3 Business	4 Education	4 Education	5 Shopping	5 Shopping	6 Recreational/Leisure	6 Recreational/Leisure	7 Visit Relatives	7 Visit Relatives	8 Others	8 Others	<input type="text"/> 33	<input type="text"/> 34
Origin	Destination																						
1 Home	1 Home																						
2 Work	2 Work																						
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4 Education	4 Education																						
5 Shopping	5 Shopping																						
6 Recreational/Leisure	6 Recreational/Leisure																						
7 Visit Relatives	7 Visit Relatives																						
8 Others	8 Others																						
<input type="text"/> 33	<input type="text"/> 34																						
17		<b>VEHICLE TYPE 5, 6, 7, 8 &amp; 9</b>																					
Use of Expressway (1=Yes/2=No) _____ 18		<b>Loaded Condition</b> 1= Empty    2= 1/4    3= 1/2    4= 3/4 5= Full    6= 20' Container    7= 40' Container 8= 60' Container _____ 35																					
Route Code _____ 19 20 21 22		<b>Commodity Carried</b> _____ 36 37 38																					
Vehicle Occupants (Including Driver) _____ 23 24		<b>Commodity Code</b> _____ Unit _____ 39 40 41																					
Vehicle Capacity (Seats) _____ 25 26		<b>Quantity</b> _____ 42 43 44 45 46																					
<b>Where do you come from? (Address)</b> City / Town _____ District _____ Origin District Code _____ 27 28 29		<b>What is the Purpose there?</b> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:50%;">Origin</th> <th style="width:50%;">Destination</th> </tr> </thead> <tbody> <tr><td>1 Load</td><td>1 Load</td></tr> <tr><td>2 Unload</td><td>2 Unload</td></tr> <tr><td>3 Unload / Load</td><td>3 Unload / Load</td></tr> <tr><td>4 Workshop &amp; Others</td><td>4 Workshop &amp; Others</td></tr> <tr> <td style="text-align: center;"><input type="text"/> 47</td> <td style="text-align: center;"><input type="text"/> 48</td> </tr> </tbody> </table>		Origin	Destination	1 Load	1 Load	2 Unload	2 Unload	3 Unload / Load	3 Unload / Load	4 Workshop & Others	4 Workshop & Others	<input type="text"/> 47	<input type="text"/> 48								
Origin	Destination																						
1 Load	1 Load																						
2 Unload	2 Unload																						
3 Unload / Load	3 Unload / Load																						
4 Workshop & Others	4 Workshop & Others																						
<input type="text"/> 47	<input type="text"/> 48																						
<b>Where are you going to? (Address)</b> City / Town _____ District _____ Destination District Code _____ 30 31 32		<b>Pakistan Transport Plan Study - JICA</b> <b>Survey Form</b> <b>RIS FORM: 1.0</b>																					
		Interviewer _____ 49 50 51																					
		Coded By: _____ 52 53 54																					
		Checked By _____ 55 56 57																					

**Pakistan Transport Plan Study in the Islamic Republic of Pakistan (PTPS)**

<b>Code</b>	<b>Commodity</b>	<b>Code</b>	<b>Commodity</b>
	<b>AGR, FOOD, FISH, FOREST &amp; L/STOCK PROD</b>		<b>MISCELLANEOUS MANUFACTURES</b>
105	Wheat		
110	Paddy and Rice	505	Machinery other than electrical
115	Maize	510	Machinery electrical (non-domestic)
120	Other Grains and Pulses	515	Domestic electric appliances
125	Sugarcane	520	Paper, Gatta, Books and other paper products
130	Cotton	525	Cycle and Auto cycles
135	Jute	530	Motor cycle, rickshaw, car, wagon, tractors and other vehicles
140	Tobacco		
145	Oil Seeds	535	Spare parts
150	Grass, Fodder, Bhoosa, moonj, dry spores, straw etc.	540	Cigarette, biri, naswar, chewing tobacco, etc.
155	Vegetables excl. potato and onion	545	General merchandize
160	Potatoes and Onion	550	Soap, Detergent
165	Fruit (Fresh and dry)	555	Sports goods
170	Animals cow, buff, goat, sheep, etc.	560	Pottery, moulding, earthen, china clay.
175	Poultry and small birds	565	Sanitary wares including sanitary tiles
180	Meat, eggs, fish, etc.	570	Ice
185	Milk, butter, cheese, yogurt and all other dairy products	575	Cans, barrels, drums, tins, etc.
190	Hides and skins	580	Paints varnishes etc.
192	Wool Raw	585	Matches
194	Plants, herbs, nursery products, etc.	590	Containers with unspecified contents and empty containers
196	Other Agr. Products	595	Other misc. products n.s.e
198	Other animal products		
199	Other agr. Food, fish, forest, products		<b>MINING AND QUARRYING</b>
	<b>RAW MATERIALS</b>	605	Ballast, gravel, stone, crush
		610	Sand and sand silica
205	Timber, Logs, Bamboo, pulp, waste papers and molasses	615	Limestone and powder
210	Waste cotton	620	Marble and its granules
215	Scrap	625	Gypsum
220	Other ores except metallic	630	Salt Rock
225	Other raw materials n.e.s.	635	China Clay
		640	Earthen Clay
	<b>BULK MANUFACTURES</b>	645	Other Metallic ores
		650	Other Mining & Quarrying
305	Cement		
310	Fertilizer		<b>FUEL, LUBRICANTS (Mineral)</b>
315	Medicine and Drugs		
320	Chemicals	705	Coal, cock briquette
325	Tea, Coffee etc.	710	Bitumen, pitchtar, Asphalt
330	Beverage (filled or un-filled)	715	Petrol
335	Oil cake, animal food not included in 150	720	Diesel
340	Dried Milk	725	Aircraft fuel
345	Other bulk goods, n.e.s.	730	Kerosene oil
		735	Furnace oil
	<b>BASIC MANUFACTURES</b>	740	Lubricants
		745	Gas products Cylinders
405	Flour and its preparations including biscuit & bakery products.	750	Fire Wood, Charcoal
410	Industrial raw food (oils)	755	Misc. Fuel and Lubricants
415	Vegetable ghee and refined edible oil (processed)		<b>MISC. GOODS NOT CLASSIFID</b>
420	Sugar refined		
425	Jaggery, gur, shakkar, desi khand	805	Mails, Postal package, etc
430	Textile fiber (Yarn)	810	House – hold effects
435	Textile manufactures	815	Official stores
440	Jute manufacture, bags	820	War firearm, ammunition
445	Leather and leather products	825	Dead body
450	Plastic and glassware products	830	Military supply
455	Wood manufactures, fixtures	835	All other commodities n.e.s.
Code	Commodity		
460	Rubber manufactures including tires, tubes, pipes, foam, etc.	n.e.s.	<b>Not Elsewhere Specified</b>
465	Iron and steel – Billets, pipes, tubing's, girders, pig iron		
470	Iron and steel finished products and other metal products		
475	Cement manufactures concrete, slabs, sleepers, etc.		
480	Bricks and firebricks		
485	Other basic manufactures, n.e.s.		



**CARGO SURVEYS AT INLAND DEPOT / DRY PORT**

**PNTPS - JICA**  
**Survey Form 4.0**

<b>Survey Site (Location)</b> <input type="text"/>	<b>From</b> _____	<b>Surveyor</b> _____
<b>Survey Direction</b> <input type="text"/>	<b>To</b> _____	<b>Coded by</b> _____
<b>Date</b> <input type="text"/>	<b>Day</b> <input type="text"/>	<b>Checked by</b> _____
<b>Time Hour Beginning</b> <input type="text"/>		

<p><b>1. Type of Movement</b></p> <p>1. Incoming <input type="checkbox"/></p> <p>2. Outgoing <input type="checkbox"/></p>	<p><b>5. Recorded Truck Capacity</b></p> <p>Tonnage <input type="text"/></p> <p>Size: <input type="text"/></p>
<p><b>2. Origin of Incoming Cargo or Destination of Outgoing</b></p> <p>1. Town City _____</p> <p>2. District _____</p> <p>3. Province _____</p> <p>4. Outside Country _____</p> <p><b>Traffic Zone</b> <input type="text"/></p>	<p><b>6. Route Taken or Intended</b></p> <p>1. Use of Motorway (1=Yes, 2=No) <input type="checkbox"/></p> <p>2. Highway Route Code <input type="text"/></p> <p><b>For Outgoing Intended Route in Above</b></p>
<p><b>3. Loaded Volume</b></p> <p>1. Empty      2. 1/4      3. 1/2</p> <p>4. 3/4      5. Full</p> <p><b>6. Container</b> <input type="checkbox"/></p> <p><b>Tonnage (If Known)</b> <input type="text"/></p>	<p><b>7. Travel Time (hours:mins)</b></p> <p>Start Time <input type="text"/></p> <p>End Time <input type="text"/></p> <p>Stoppage (Hours:Minutes) <input type="text"/></p> <p><b>For Outgoing Estimate</b></p>
<p><b>4. Cargo Type</b></p> <p>1-Perishable goods (vegetables, fresh meat and fish)</p> <p>2-Agricultural &amp; forestry products,</p> <p>3-Processed foods or Dried food</p> <p>4-Live stock</p> <p>5-Construction materials (Processed Timber, Cement, Soil, Bricks, Crush, Sand etc.)</p> <p>6- Mining products excluding construction materials</p> <p>7- Chemical products except for fuels</p> <p>8- Fuels/Oils</p> <p>9- Metals and machinery</p> <p>10- Misc. Industrial products</p> <p>11- Break Bulk i.e. Mixed Category</p> <p>12-Others (specify):</p> <p>13 - Unknown</p> <p><b>Container Size 20ft/ 40ft/ 60ft</b> <input type="text"/></p>	<p><b>8. Comments (if any)</b></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

**CARGO SURVEYS AT INLAND DEPOT / DRY PORT**

**PNTPS - JICA**  
**Survey Form 4.0**

Survey Site (Location) <input type="text"/>	From _____	Surveyor _____	<input type="text"/>
Survey Direction <input type="text"/>	To _____	Coded by _____	<input type="text"/>
Date <input type="text"/>	Day <input type="text"/>	Checked by _____	<input type="text"/>
Time Hour Beginning <input type="text"/>			<input type="text"/>

<p><b>1. Type of Movement</b></p> <p>1. Incoming <input type="checkbox"/></p> <p>2. Outgoing <input type="checkbox"/></p> <hr/> <p><b>2. Origin of Incoming Cargo or Destination of Outgoing</b></p> <p>1. Town City _____</p> <p>2. District _____</p> <p>3. Province _____</p> <p>4. Outside Country _____</p> <p><b>Traffic Zone</b> <input type="text"/></p>	<p><b>5. Recorded Truck Capacity</b></p> <p>Tonnage <input type="text"/></p> <p>Size: <input type="text"/></p> <hr/> <p><b>6. Route Taken or Intended</b></p> <p>1. Use of Motorway (1=Yes, 2=No) <input type="checkbox"/></p> <p>2. Highway Route Code <input type="text"/></p> <p><b>For Outgoing Intended Route in Above</b></p> <hr/> <p><b>7. Travel Time (hours:mins)</b></p> <p>Start Time <input type="text"/></p> <p>End Time <input type="text"/></p> <p>Stoppage (Hours:Minutes) <input type="text"/></p> <p><b>For Outgoing Estimate</b></p> <hr/> <p><b>8. Comments (if any)</b></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p><b>3. Loaded Volume</b></p> <p>1. Empty      2. 1/4      3. 1/2</p> <p>4. 3/4      5. Full</p> <p><b>6. Container</b> <input type="checkbox"/></p> <p><b>Tonnage (If Known)</b> <input type="text"/></p> <hr/> <p><b>4. Cargo Type</b></p> <p>1-Perishable goods (vegetables, fresh meat and fish)</p> <p>2-Agricultural &amp; forestry products,</p> <p>3-Processed foods or Dried food</p> <p>4-Live stock</p> <p>5-Construction materials (Processed Timber, Cement, Soil, Bricks, Crush, Sand etc.)</p> <p>6- Mining products excluding construction materials</p> <p>7- Chemical products except for fuels</p> <p>8- Fuels/Oils</p> <p>9- Metals and machinery</p> <p>10- Misc. Industrial products</p> <p>11- Break Bulk i.e. Mixed Category</p> <p>12-Others (specify):</p> <p>13 - Unknown</p> <p><b>Container Size 20ft/ 40ft/ 60ft</b> <input type="text"/></p>	

**PASSENGER INTERVIEW SURVEY**  
(AT BUS STATIONS / RAILWAY STATIONS / AIRPORTS)

PNTPS - JICA  
Survey Form 5.0

Survey Site (Location)	<input type="text"/>	From	<input type="text"/>	Surveyor	<input type="text"/>
Survey Direction	<input type="text"/>	To	<input type="text"/>	Coded by	<input type="text"/>
Date	<input type="text"/>	Day	<input type="text"/>	Checked by	<input type="text"/>
Time Hour Beginning	<input type="text"/>				

1. Interviewee's Gender    1 Male  2 Female

2. Occupation            1 Employed    2 Self Employed (Business)    3 Other (specify)

**3. Income Level**

1. Up to Rs.3,000. Per Month
2. Rs.3001 to Rs.10,000/month
3. Rs.10,000 to Rs.20,000/month
4. Rs 20,000 to 50,000 / Month
5. Over 50,000 / Month

**4. Passenger Type**

1. Arriving
2. Departing

**5. Origin (Arriving Passengers) or Destination of Departing Passenger**

1. Town / City
2. District
3. Province

Traffic Zone

**6. Trip Purpose @ Origin**

1. Home
2. Work
3. Business
4. Education
5. Shopping
6. Recreation/Leisure
7. Visit Relatives
8. Other

**7. Transport Mode to Terminal @ Origin**

1. Bus	Fare RS	<input type="text"/>
2. Taxi/Rickshaw	Travel Time to terminal	<input type="text"/>
3. Private Transport	Hours:Mins	<input type="text"/>
4. Walk/Cycle		<input type="text"/>
5. Other <input type="checkbox"/>		<input type="text"/>

Comments @ origin

**8. Trip Purpose @ Destination**

1. Home
2. Work
3. Business
4. Education
5. Shopping
6. Recreation/Leisure
7. Visit Relatives
8. Other

**9. Transport Mode to Terminal @ Destination**

1. Bus	Fare RS	<input type="text"/>
2. Taxi/Rickshaw	Travel Time to terminal	<input type="text"/>
3. Private Transport	Hours:Mins	<input type="text"/>
4. Walk/Cycle		<input type="text"/>
5. Other <input type="checkbox"/>		<input type="text"/>

Comments @ Destination

**Long Distance Bus Survey**

**PNTPS - JICA  
Bus Survey Form 3.0**

Location (Zone)	<input type="text"/>	From	Surveyor	<input type="text"/>
Survey Direction	<input type="text"/>	To	Coded by	<input type="text"/>
Date	<input type="text"/>	Day	<input type="checkbox"/>	Checked by
Time Hour Beginning	<input type="text"/>			<input type="text"/>

<b>1. Bus Type</b>	
1. Mini Bus (Up to 20 Seater)	<input type="text"/>
2. Large Bus (Over40 Seater)	<input type="text"/>
3. Record Number of Seats	<input type="text"/>
<b>2. Operator (ownership)</b>	
1. Owner Operator	<input type="checkbox"/>
2. Company	<input type="checkbox"/>
Number of Buses Under the Ownership	<input type="text"/>
<b>3. Route</b>	
1. Local (Within District)	<input type="checkbox"/>
2. Inter District	<input type="checkbox"/>
3. Inter Provincial	<input type="checkbox"/>
Origin of Route - City-District-Province	Zone= <input type="text"/>
Destination of Route City-District-Province	Zone= <input type="text"/>
Number of Intermediate Stops	<input type="text"/>
<b>4. Journey Time</b>	
Approximate Journey Time from Origin to Destination (Hours:Mins)	<input type="text"/>
Intermediate Stopping Time (Hours:Minutes)	<input type="text"/>
<b>5. Frequency</b>	
1. Number of Buses Operated by Your Co Per Hour	Code No of Buses per Hour <input type="text"/>
2. Hours of Operation in 24 Hour Period	Code Hours e.g. 12/16/24 <input type="text"/>
<b>6. Fare Charged</b>	
1. Minimum Fare Round to Nearest (PKR)	<input type="text"/>
2. Fare /km after the Minimum Fare (Rs.Paisa xx.xx)	<input type="text"/>
3. Maximum fare for the Route (From Origin to Destination) Rupees.	<input type="text"/>
<b>7. Bus Occupancy</b>	
Number of Occupants Including Driver & Conductor	<input type="text"/>
<b>8. Comments</b>	
<input type="text"/>	



#### A.4.4 Pilot Survey

Prior to the field survey, a pilot survey was carried out by the sub-contractor near Islamabad on 13 August, 2005 (Saturday) for two hours in the afternoon.



Photos: Pilot Survey,  
JICA Study Team

#### A.4.5 Quality Assurance

The survey organization is shown in Figure A-2. A comprehensive mechanism of on spot checks and survey inspections was instituted by employing independent staffs, counterpart resources, and frequent survey site checks by confidential visits of the Study Team as well. Survey was repeated at locations wherever found it is necessary.

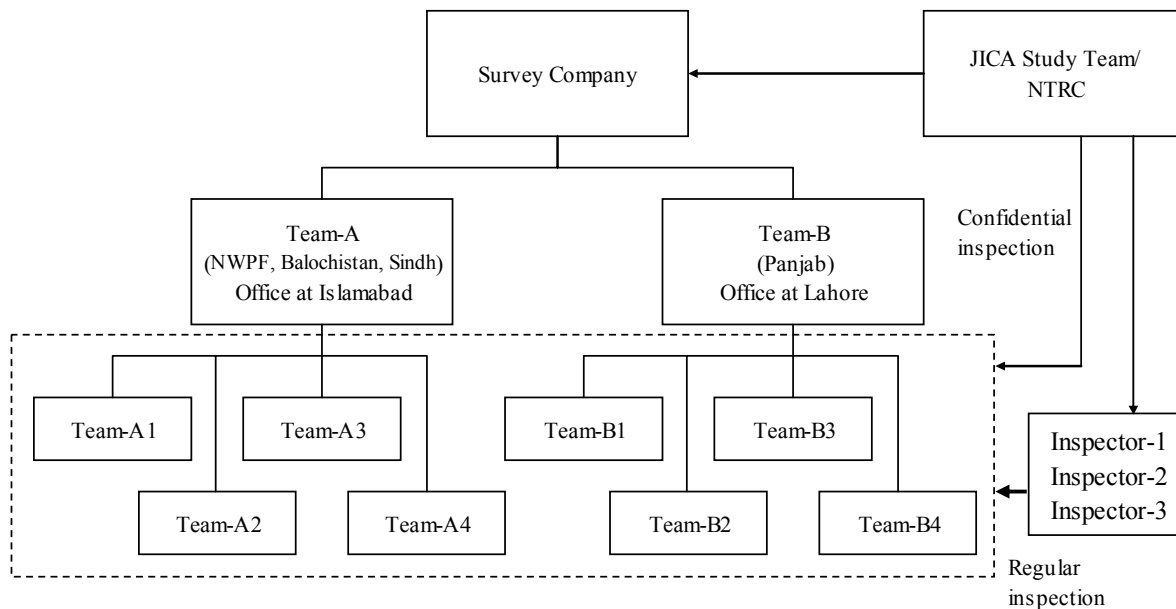


Figure A-2 Survey Organization

## A.5 Survey Conduct

### (1) Roadside O/D Interview Survey (RIS)

The RIS was carried out from 19th August to 17th September as shown in Table A-3. In order to complete the RIS at 100 sites in such short period, eight survey teams were dispatched throughout the country. The survey teams travelled from site to site and conducted the survey at each site except on Sunday. Although the original work plan was scheduled to complete the all field works by the end of September by four teams, the Study Team requested to increase the number of survey teams to complete the all field survey by 11th September in order to report the result of the traffic survey to the JICA Advisory Committee. Because of a general strike called on 9th September, the deadline was rescheduled at 17th September. Since traffic flow was unusual at 152 and 261, the surveys at these sites were cancelled and conducted again on the other days. During the survey, the survey teams failed to mobilize the staff for RIS at 106, 315, 393, and 486. The surveys at 106, 393, and 486 were conducted on 6<sup>th</sup> October (Thursday), and the survey at 315 was conducted on 8<sup>th</sup> October (Saturday).

**Table A-3 Date-wise Progress of RIS Survey**

Month	Date	Day	Site #								
			A-1	A-2	A-3	A-4	B-1	B-2	B-3	B-4	
8	19	Friday	152*	384				261*	2106		
	20	Saturday	199	385				227	228		
	21	Sunday									
	22	Monday	1100	344				226	269		
	23	Tuesday	101		3110			2105	271		
	24	Wednesday	Holiday					264	270		
	25	Thursday	Election								
	26	Friday	102					2104	2107		
	27	Saturday	103	345	346	347		263	265	229	
	28	Sunday									
	29	Monday	197		387	388	233	2108	230		
	30	Tuesday	105	411	389	3113	207	262	273		
	31	Wednesday				395	221	222	274		
9	1	Thursday	120	434	391	3114	223	2103	238	239	
	2	Friday	106**	480	393**	394	224	2102	272		
	3	Saturday	149	436	348		255	2101	231	268	
	4	Sunday									
	5	Monday	110	437	316	419	253	254	2109	232	
	6	Tuesday	150	435		486**	204	251	276	277	
	7	Wednesday				4116			240		
	8	Thursday	109	412			256		278		
	9	Friday	Strike								
	10	Saturday	108	313	343	3201	225		241	279	
	11	Sunday									
	12	Monday	314	315**	381	383	2201	261			
	13	Tuesday									
	14	Wednesday		2204		3203					
	15	Thursday									
	16	Friday									
	17	Saturday		152							

\* The survey was postponed due to unusual traffic flow.

\*\* The survey was postponed due to the failure of mobilization

The RIS was conducted from Monday to Saturday. The numbers of survey sites according to day of the week are shown in Table A-4:

**Table A-4 Number of RIS sites according to day of the week**

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
24	16	9	15	10	28

The total sampling rate for interview was 16.5% (excluding site no. 106, 315, 486, and 393). The lowest sampling rate by vehicle type was 12.9% for cars, while the sampling rate of large buses was 23.6% followed by 21.2% of container trucks as shown in Table A-5.

**Table A-5 Sampling Rate of RIS by Vehicle Type**

Car	Minibus	Large Bus	Pickup truck	2-Axle truck	3,4,5,6 Axle truck	Container truck	Agri-culture tractor
12.9%	18.7%	23.6%	13.1%	18.7%	18.0%	21.2%	15.0%

## (2) Cargo O/D Survey at Dry Depots

The Cargo O/D Survey was carried out in the same way as the RIS at eight major dry depots as shown in Table A-6:

**Table A-6 Cargo O/D Survey at Dry Depot**

Code	Dry Depot	Date	Traffic Volume	Interviewed
IDC01	Lahore	30-August	240	34
IDC02	Karachi	03-September	206	88
IDC03	Quetta	05-September	N.A.*	52
IDC04	Peshawar	01-September	43	32
IDC05	Multan	10-September	24	16
IDC06	Rawalpindi	06-September	10	10
IDC07	Hyderabad	31-August	33	21
IDC08	Port Qasim	03-September	244	100
IDC09	Faisalabad	02-September	251	33
IDC10	Sialkot	19-September	196	20

\* The subcontractor failed to record the number of traffic volume.

## (3) Cross-border Traffic Count Survey

The Cross-border Traffic Count Survey, including truck interview, was conducted at the five borders as shown in Table A-7.

**Table A-7 List of Cross-border Traffic Count Survey**

Code	Site	Border of	Date	Volume	Interview
CB01	Sust	China	05-September	51	36
CB02	Wagha	India	30-August	11	11
CB03	Torkhan	Afghanistan, to Kabul	03-September	401	100
CB04	Taftan	Iran	08-September	29	23
CB05	Chaman	Afghanistan, to Kandahar	06-September	63	44

#### (4) Passenger Interview Survey

The Passenger Interview Survey was carried out at five airports, five railway stations, and five bus terminals in five major cities as shown in Table A-8:

**Table A-8 List of Passenger Interview Survey**

City	Railway	Bus Terminal	Airport
Peshawar	02-September	31-August	02-September
Islamabad	06-September (200)	05-September (200)	06-September (202)
Lahore	01-September (200)	31-August (205)	01-September (201)
Multan	09-September (200)	08-September (180)	09-September (202)
Karachi	01-September	02-September	02-September

#### (5) Long-distance Bus Survey

The Long-distance Bus Survey was carried out at major bus terminals in eight major cities as shown in Table A-9.

**Table A-9 Long Distance Bus Survey**

Code	Bus terminal	Survey Date	Traffic Volume (Departure/Arrival)	Surveyed
LDB1	Peshawar	31-August	Not counted	100
LDB2	Islamabad	05-September	1,915	180
LDB3	Lahore	31-August	3,650	192
LDB4	Faisalabad	03-September	2,620	256
LDB5	Multan	08-September	1,615	167
LDB6	Hyderabad	29-August	Not counted	98
LDB7	Karachi	02-September	Not counted	100
LDB8	Quetta	05-September	Not counted	100
LDB9	Bahawarpur	10-September	1,085	123
LDB10	Sukkur	29-August	Not counted	100

## A.6 The Result of the Traffic Survey

### A.6.1 MCC Survey

#### (1) Traffic Volume

The total number of vehicles counted during the MCC Survey amounted to 554,270 including motorcycles, and 455,731 excluding motorcycles as shown in Table A-10.

**Table A-10 Total Traffic Volume Counted in the MCC Survey**

Vehicle Type	No.	% Total	% Total (exc. Motorcycle)
Motorcycle	98,539	17.8	–
Car/ Jeep/ Taxi/ Pickup/ 4WD	170,575	30.8	37.4
Minibus/ Medium Buses (up to 20 seats)	67,824	12.2	14.9
Large Buses (Over 20 seats)	41,098	7.4	9.0
Pickup Truck (Open Back Single/ Double Cabin)	42,862	7.7	9.4
2-Axle Truck (Rigid)	68,467	12.4	15.0
3 Axle Truck (Rigid)	34,086	6.1	7.5
Articulated Vehicle 4,5,6 or more Axles	22,022	4.0	4.8
Agricultural Tractor/ Trolley	8,797	1.6	1.9
Total	554,270	100	100

The maximum traffic volume of 29,439 vehicles was observed at No. 2106 (Lahore-Shekhupura), where motorcycles counted 15,542 (53%). When motorcycle is excluded, No. 263 (N5: Khudhab - Jang) had the maximum traffic volume of 18,622 vehicles. Traffic volumes by each site are summarized in Table A-11 and Table A-12.



**Table A-11 Result of the Traffic Survey -1 (16hours)**

Site Code	date	Motor-cycle	Car	Minibus	Bus	Light Truck	2-Axle Truck	3-Axle Truck	Tractor/Trailer	Agriculture	Total
101	23-Aug	3	115	52	45	39	173	8	3	1	439
102	26-Aug	101	545	456	39	67	51	4	0	1	1264
103	27-Aug	133	3127	1737	636	245	750	104	24	55	6811
105	30-Aug	22	381	440	51	85	172	35	0	4	1190
105	31-Aug	20	324	421	54	66	203	44	0	2	1134
106	2-Sep	78	319	300	35	66	80	30	7	13	928
106	6-Oct	31	182	126	57	70	109	88	14	43	720
108	10-Sep	181	108	120	124	50	120	274	199	35	1211
109	8-Sep	5	46	37	12	35	49	1	0	3	188
110	5-Sep	24	18	6	2	7	17	0	0	0	74
120	1-Sep	9	496	532	4	29	81	7	0	5	1163
149	3-Sep	25	28	23	0	14	0	0	0	0	90
150	6-Sep	43	434	472	170	118	389	432	264	33	2355
152	16-Sep	336	824	647	42	148	150	30	47	81	2305
197	29-Aug	106	2145	1818	262	262	689	453	273	108	6116
199	20-Aug	509	2800	1805	272	811	773	136	21	161	7288
1100	22-Aug	17	355	178	0	69	75	1	0	1	696
204	6-Sep	180	4140	1851	975	907	1740	421	170	21	10405
204	7-Sep	144	4605	1890	898	787	1696	434	212	23	10689
204	8-Sep	129	4472	1884	893	827	1708	469	177	35	10594
207	30-Aug	358	436	224	150	248	411	183	80	41	2131
221	31-Aug	342	653	335	143	202	362	228	249	60	2574
222	31-Aug	56	254	31	105	121	241	55	112	17	992
223	1-Sep	359	630	248	82	265	192	11	8	29	1824
224	2-Sep	705	773	570	146	234	267	57	17	43	2812
225	10-Sep	1206	7248	2266	1348	1237	1980	809	325	95	16514
225	12-Sep	1244	7479	2030	1018	1062	1821	715	220	88	15677
225	13-Sep	1150	7772	2180	1222	1177	2255	826	312	135	17029
226	22-Aug	568	1450	424	453	360	434	412	194	165	4460
227	20-Aug	432	832	470	604	526	439	138	95	137	3673
227	22-Aug	1084	1497	606	550	449	557	220	117	209	5289
227	23-Aug	1187	1448	433	351	426	695	168	134	133	4975
228	20-Aug	676	707	569	43	204	242	54	16	60	2571
229	27-Aug	525	963	670	245	161	243	130	16	40	2993
230	29-Aug	1100	933	491	323	144	156	76	13	200	3436
231	3-Sep	357	544	247	185	140	285	153	165	38	2114
232	5-Sep	357	201	239	31	71	227	86	114	50	1376
233	29-Aug	372	475	215	219	181	350	263	331	53	2459
233	30-Aug	415	541	206	229	179	338	239	313	63	2523
233	31-Aug	409	554	186	223	147	359	221	246	76	2421
238	1-Sep	684	550	289	201	115	152	57	21	99	2168
239	1-Sep	578	470	274	221	206	162	43	31	77	2062
240	7-Sep	2429	2446	727	469	529	1048	1086	1069	201	10004
241	10-Sep	747	267	192	171	132	213	176	437	33	2368
251	6-Sep	50	592	464	81	98	131	3	0	0	1419
253	5-Sep	1237	5718	2634	965	1262	2454	469	179	193	15111
254	5-Sep	299	3496	1357	502	712	635	320	178	208	7707
255	3-Sep	388	7153	1918	725	823	1547	721	197	21	13493
256	8-Sep	2593	7113	1270	896	1146	2291	668	254	56	16287
261	12-Sep	2000	9377	3222	2161	1490	1256	654	282	180	20622
262	30-Aug	939	619	341	276	209	385	153	101	140	3163
263	27-Aug	522	275	135	79	80	120	31	30	90	1362
264	24-Aug	1143	1329	223	252	265	992	1362	112	170	5848
265	27-Aug	172	236	89	121	95	182	51	45	93	1084
268	3-Sep	143	136	39	124	66	82	17	16	39	662
269	22-Aug	652	721	251	11	201	346	74	21	110	2387
270	24-Aug	1409	3579	341	1061	638	1426	692	675	139	9960
271	23-Aug	1307	543	113	107	167	220	111	73	217	2858
272	2-Sep	469	1992	308	738	466	1041	798	667	88	6567

**Table A-12 Result of the Traffic Survey -2 (16hours)**

Site Code	date	Motor-cycle	Car	Minibus	Bus	Light Truck	2-Axle Truck	3-Axle Truck	Tractor/Trailer	Agriculture	Total
273	30-Aug	536	709	511	167	208	188	58	19	102	2498
274	31-Aug	290	414	349	273	150	191	46	21	65	1799
276	6-Sep	858	2686	1599	412	761	989	351	261	78	7995
277	6-Sep	864	896	515	185	465	814	220	116	57	4132
277	7-Sep	873	926	529	187	415	690	222	125	55	4022
277	8-Sep	1005	878	605	216	410	872	344	154	54	4538
278	8-Sep	290	567	150	190	246	848	1050	971	42	4354
279	10-Sep	738	403	168	137	88	126	31	32	33	1756
2101	3-Sep	504	1459	655	112	362	222	52	61	110	3537
2102	2-Sep	1041	223	124	67	76	43	9	2	71	1656
2103	1-Sep	602	1201	275	653	337	711	258	88	52	4177
2104	26-Aug	620	766	411	324	244	325	77	74	90	2931
2105	23-Aug	453	436	80	132	114	282	459	79	118	2153
2106	19-Aug	15542	4879	3838	2005	1337	957	370	145	366	29439
2107	26-Aug	1172	257	231	21	69	20	0	0	97	1867
2108	29-Aug	992	326	280	39	187	162	53	20	252	2311
2109	5-Sep	439	398	362	21	166	217	132	74	266	2075
2201	12-Sep	9754	7877	557	250	1281	440	95	33	290	20577
2207	19-Sep	6097	1511	206	34	952	163	9	2	144	9118
313	10-Sep	277	222	180	148	51	311	310	181	124	1804
314	12-Sep	235	331	389	91	63	233	398	20	34	1794
315	12-Sep	790	764	230	338	226	1271	893	1264	62	5838
315	8-Oct	158	421	159	313	122	1467	1220	1327	55	5242
316	5-Sep	895	3053	1115	1553	1125	1157	795	316	0	10009
316	6-Sep	878	2718	881	1379	1090	1117	730	298	7	9098
316	7-Sep	796	2395	897	1259	1233	1126	715	342	4	8767
343	10-Sep	250	357	319	139	81	125	54	12	5	1342
344	22-Aug	508	488	165	9	35	124	51	28	49	1457
345	23-Aug	199	1237	73	614	91	901	1032	1383	2	5532
346	27-Aug	1281	537	208	203	75	120	5	12	101	2542
347	27-Aug	320	77	57	4	6	14	0	0	31	509
348	3-Sep	510	5400	531	1658	1317	1558	1556	896	1	13427
381	12-Sep	717	1530	1526	554	627	827	337	222	97	6437
382	14-Sep	320	292	377	83	112	95	35	5	57	1376
383	12-Sep	1727	1867	1444	760	631	1430	1152	1433	123	10567
384	19-Aug	914	171	27	33	9	18	11	9	48	1240
385	20-Aug	1714	1379	449	374	316	825	873	830	56	6816
387	29-Aug	460	325	18	148	159	210	1	4	27	1352
388	29-Aug	385	645	239	181	172	173	23	15	17	1850
389	30-Aug	579	1165	70	679	304	619	50	46	14	3526
391	1-Sep	2744	2162	1298	627	559	877	45	6	120	8438
393	2-Sep	440	588	172	151	298	424	101	117	15	2306
393	6-Oct	557	653	290	265	483	503	265	200	120	3336
394	2-Sep	508	328	105	140	115	89	3	28	21	1337
395	31-Aug	143	207	158	82	165	172	41	52	7	1027
3110	26-Aug	359	96	48	14	7	20	0	0	39	583
3113	30-Aug	144	51	34	22	21	22	1	7	14	316
3114	1-Sep	203	387	189	104	248	343	15	46	8	1543
3201	10-Sep	338	187	40	15	46	16	0	0	23	665
3203	14-Sep	65	362	45	94	251	589	793	822	0	3021
411	29-Aug	338	178	173	8	221	336	27	0	91	1372
411	30-Aug	358	82	270	9	295	427	1	0	102	1544
412	8-Sep	405	411	396	171	149	621	507	36	69	2765
419	5-Sep	20	76	16	45	38	52	18	9	3	277
434	1-Sep	345	271	283	21	127	197	0	0	43	1287
435	9-Jun	128	187	164	75	98	414	308	19	50	1443
436	3-Sep	264	700	506	340	571	489	179	57	118	3224
437	5-Sep	41	147	153	59	156	131	31	17	17	752
480	2-Sep	226	354	337	52	164	205	17	3	64	1422
486	9-Jun	462	191	115	142	181	285	147	83	21	1627
486	6-Oct	138	125	25	162	169	202	110	4	15	950
4116	7-Sep	115	39	25	10	18	43	0	2	14	266

**(2) Traffic Increase**

Traffic volume data of 10 years ago is available in NTRC publications. Table A-13 shows the comparison of traffic volume between the NTRC data of 1995/96 and the data of the MCC Survey of PTPS. Although the both data do not necessarily represent annual average traffic volumes, general tendencies of traffic volume can be observed from the comparison. Traffic volumes decreased at several sites along N5 and N55, while the tendency is toward higher traffic volume along other National Highways.

**Table A-13 Comparison of Traffic Volume between 1995/96 and 2005**

Road Name	Reference Code				Volume (*1)			
	NTRC	Year	PTPS	16/24hrs	NTRC(a)	PTPS 16hrs	24hrs(b)	Ratio(b/a)
N5/Peshawar-Rawalpindi	N5-07A	1995	204	24	14,349		18,856	1.31
	N5-09	1995	253	16	15,537	13,874	17,485	1.13
N5/Rawalpindi-Lahore	N5-14	1995	255	16	12,013	13,105	16,242	1.35
	N5-17	1995	256	16	11,073	13,694	17,239	1.56
	N5-21	1995	225	24	12,478		19,196	1.54
N5/Lahore-Multan	N5-30	1996	270	16	8,407	8,551	10,983	1.31
	N5-33	1996	272	16	7,890	6,098	7,991	1.01
N5/Multan-Hyderabad	N5-41	1996	278	16	8,347	4,064	5,658	0.68
	N5-44	1996	315	24	9,554		7,159	0.75
	N5-50	1996	383	16	11,155	8,840	11,698	1.05
	N5-60	1996	393	24	12,079		4,558	0.38
N25	N25-01	1995	316	24	6,829		9,911	1.45
	N25-04	1995	486	24	1,479		1,733	1.17
	N25-08	1995	436	16	2,907	2,960	3,845	1.32
N35	N35-01	1995	103	16	5,566	6,678	8,134	1.46
N40	N40-02	1995	437	16	561	711	930	1.66
N50	N50-02	1995	480	16	1,061	1,196	1,515	1.43
	N50-06	1995	109	16	37	183	239	6.46
N65	N65-03	1995	412	24	3,918	2,997	4,049	1.03
N70	N70-07	1995	411	24	1,442	1,392	1,888	1.31
N55	N55-01	1996	197	16	5,525	6,010	7,522	1.36
	N55-03	1996	150	16	5,573	2,312	3,057	0.55
	N55-05	1996	108	16	251	1,030	1,394	5.55
	N55-13	1996	313	24	1,014		1,924	1.90
	N55-17	1996	343	16	2,790	1,092	1,358	0.49

Remarks: Traffic volumes exclude non-motor traffic and motorcycles.

\*1: 24hours traffic volumes were estimated from 16hours traffic volume and 24hours/16hours ratio.

Source: "Summary of Traffic Data for National Highways (1995), NTRC", "Summary of Traffic Data for National Highways (1996), NTRC", and PTPS



### (3) Vehicle Composition

Table A-14 shows the composition of the counted vehicles in the MCC Survey, excluding motorcycle. The composition of cars, buses and trucks (including agriculture tractor) are 37.0%, 24.1%, and 38.9%, respectively.

**Table A-14 Composition of Counted Vehicles**

Car	Minibus	Large Bus	Pickup truck	2-Axle truck	3-Axle truck	Container truck	Agri-culture tractor
37.0%	15.0%	9.1%	9.3%	15.2%	7.6%	4.9%	1.9%
37.0%	24.1%		38.9%				

The Detailed Truck Classification Survey was conducted at selected four sites. The result shows that 2-Axle trucks account for 42.2%, and 3-Axle trucks account for 30.2% as shown in Table A-15.

**Table A-15 Composition of Trucks by Axle Number at the 4 Sites**

2-Axle	3-Axle	4-Axle	5-Axle	6-Axle
42.2%	30.2%	17.9%	6.2%	3.5%

### (4) Night Time Traffic

The RIS was carried out for 16 hours from 6:00 to 22:00, and the most sites of the MCC Survey were the sites of 16 hours traffic count survey. In the MCC Survey, 24-hours traffic count surveys were conducted at 17 sites to calculate the expansion ratio from 16 hours traffic to 24hours traffic. The geometric mean of the expansion ratio of total traffic is calculated at 1.25 as shown in Table A-16. The expansion ratio of trucks is 1.46, which is higher than the average. The total traffic from 22:00 to the next 6:00 (hereinafter defined as “Night Traffic”) accounts for 20.3%, while the Night Traffic of trucks accounts for 31.5%. This factor will be considered in making O/D matrices.

**Table A-16 Ratio of 24hours Traffic to 16hours Traffic**

Car	Mini-bus	Large Bus	Pickup truck	2-Axle truck	3-Axle truck	Container truck	Agri-culture tractor	Total
1.16 (14.0)	1.11 (10.1)	1.30 (22.9)	1.32 (24.5)	1.53 (34.7)	1.52 (34.0)	1.41 (29.3)	1.21 (17.1)	1.25 (20.3)
	1.18 (15.6)		1.46 (31.5)					

\* Numbers in round brackets is the percentage of “Night Traffic” from 22:00 to the next 6:00.

## A.6.2 The Result of Roadside O/D Interview Survey

### (1) Sampling Rate

The total number of interviewed vehicles during the RIS amounted to 75,027. The average sampling rate was 34.9% (simple average) and 21.5% (weighted average). Table A-17 and Table A-18 show the number of samples and sampling rates.

**Table A-17 Number of Interviewed Vehicles and Sampling Rate (2)**

Site Code	Date	Car	Minibus	Bus	Light Truck	2-Axle Truck	3-Axle Truck	Trailer Tractor	Agriculture	Total	Sample Rate
101	23-Aug	88	50	28	29	158	7	4	0	364	83.5%
102	26-Aug	393	349	15	54	33	2	0	2	848	72.9%
103	27-Aug	923	688	380	61	403	56	8	0	2519	37.7%
105	30-Aug	301	399	45	99	231	32	0	0	1107	94.8%
106	6-Oct	58	49	28	18	44	37	1	1	236	34.3%
108	10-Sep	39	75	83	18	58	161	97	0	531	51.6%
109	8-Sep	20	25	7	19	31	1	0	2	105	57.4%
110	5-Sep	11	6	2	5	15	0	0	0	39	78.0%
120	1-Sep	268	373	4	27	56	7	0	1	736	63.8%
149	3-Sep	15	11	0	9	0	0	0	0	35	53.8%
150	6-Sep	129	172	98	17	124	161	106	0	807	34.9%
152	16-Sep	287	246	19	37	121	10	29	5	754	38.3%
197	29-Aug	639	855	139	45	383	241	157	8	2467	41.0%
199	20-Aug	653	625	203	97	466	87	7	9	2147	31.7%
204	6-Sep	405	209	109	53	180	69	32	1	1058	10.3%
207	30-Aug	70	54	60	31	90	50	19	3	377	21.3%
221	31-Aug	79	82	58	37	75	51	54	8	444	19.9%
222	31-Aug	63	8	32	27	62	11	28	2	233	24.9%
223	1-Sep	107	96	54	36	68	4	2	2	369	25.2%
224	2-Sep	173	154	43	53	95	29	9	10	566	26.9%
225	10-Sep	806	260	262	123	272	132	62	9	1926	12.6%
226	22-Aug	337	11	143	42	145	107	42	15	842	21.6%
227	20-Aug	337	161	338	123	210	48	79	41	1337	41.3%
228	20-Aug	89	115	37	81	80	19	9	24	454	24.0%
229	27-Aug	147	132	84	59	80	43	12	24	581	23.5%
230	29-Aug	139	122	99	57	56	39	9	51	572	24.5%
231	3-Sep	91	60	54	39	67	46	41	20	418	23.8%
232	5-Sep	49	65	21	27	59	28	39	15	303	29.7%
233	29-Aug	102	74	89	35	106	63	89	10	568	27.2%
238	1-Sep	88	82	66	41	38	27	17	32	391	26.3%
239	1-Sep	88	58	61	46	52	23	19	28	375	25.3%
240	7-Sep	245	123	107	81	158	152	188	44	1098	14.5%
241	10-Sep	70	62	50	41	61	55	98	17	454	28.0%
251	6-Sep	152	162	46	25	65	0	0	0	450	32.9%
253	5-Sep	524	273	155	89	250	53	25	10	1379	9.9%
254	5-Sep	487	258	90	83	107	66	59	14	1164	15.7%
255	3-Sep	600	172	152	63	168	94	35	2	1286	9.8%
256	8-Sep	807	199	187	89	244	126	65	7	1724	12.6%
261	12-Sep	902	303	255	134	156	70	37	21	1878	10.1%
262	30-Aug	106	68	74	32	86	28	28	26	448	20.1%
263	27-Aug	79	35	28	27	47	14	8	29	267	31.8%
264	24-Aug	211	27	73	43	186	310	28	29	907	19.3%
265	27-Aug	85	25	71	23	99	19	13	21	356	39.0%
268	3-Sep	44	19	49	25	32	8	9	20	206	39.7%
269	22-Aug	128	47	12	68	85	21	11	31	403	23.2%
270	24-Aug	275	53	176	75	169	83	80	27	938	11.0%
271	23-Aug	141	10	19	47	57	22	5	35	336	21.7%
272	2-Sep	253	79	182	93	164	138	141	30	1080	17.7%

**Table A-18 Number of Interviewed Vehicles and Sampling Rate (2)**

Site Code	Date	Car	Minibus	Bus	Light Truck	2-Axle Truck	3-Axle Truck	Trailer Tractor	Agricu- lture	Total	Sample Rate
273	30-Aug	134	116	62	68	67	31	10	28	516	26.3%
274	31-Aug	87	88	82	51	56	21	16	25	426	28.2%
276	6-Sep	259	179	79	101	149	66	60	32	925	13.0%
277	6-Sep	110	94	76	57	108	60	50	13	568	17.4%
278	8-Sep	119	58	70	82	195	199	197	24	944	23.2%
279	10-Sep	68	57	61	28	42	17	19	13	305	30.0%
313	10-Sep	101	92	73	5	134	165	95	0	665	43.5%
314	12-Sep	97	159	55	17	97	194	8	0	627	40.2%
315	8-Oct	186	79	215	17	554	298	232	4	1585	31.2%
316	5-Sep	337	111	317	136	217	140	62	0	1320	14.5%
316	7-Sep	334	127	315	160	281	160	72	0	1449	18.2%
343	10-Sep	150	148	80	24	79	26	9	3	519	47.5%
344	22-Aug	254	92	11	10	92	36	23	14	532	56.1%
345	23-Aug	333	11	317	11	226	260	366	0	1524	28.6%
346	27-Aug	204	89	133	33	74	1	7	12	553	43.9%
347	27-Aug	73	58	5	6	15	0	0	11	168	88.9%
348	3-Sep	487	47	564	119	405	215	306	1	2144	16.6%
381	12-Sep	306	472	261	111	307	125	65	9	1656	29.0%
383	12-Sep	267	269	287	82	250	167	255	21	1598	18.1%
384	19-Aug	122	13	24	7	19	2	3	11	201	61.7%
385	20-Aug	334	122	198	28	245	219	332	3	1481	29.0%
387	29-Aug	193	14	121	104	183	2	2	8	627	70.3%
388	29-Aug	386	168	148	71	116	5	10	1	905	61.8%
389	30-Aug	200	9	196	82	209	13	29	3	741	25.1%
391	1-Sep	188	107	183	66	159	1	0	7	711	12.5%
393	6-Oct	130	93	107	75	134	59	40	7	645	23.2%
394	2-Sep	116	38	96	32	41	3	16	4	346	41.7%
395	31-Aug	132	106	56	76	133	16	27	1	547	61.9%
411	30-Aug	29	101	12	76	342	1	0	0	561	47.3%
412	8-Sep	152	155	61	25	178	198	15	0	784	33.2%
419	5-Sep	56	12	38	26	36	15	8	0	191	74.3%
434	1-Sep	81	97	13	28	82	0	0	0	301	32.0%
435	9-Jun	61	79	45	20	155	95	4	0	459	34.9%
436	3-Sep	181	145	155	132	160	35	14	0	822	27.8%
437	5-Sep	68	66	49	70	70	20	15	0	358	50.4%
480	2-Sep	96	97	13	33	85	5	1	0	330	27.6%
486	6-Oct	69	17	92	58	103	45	1	0	385	47.4%
1100	22-Aug	276	130	0	43	69	1	0	0	519	76.4%
2101	3-Sep	297	209	46	60	92	12	30	9	755	24.9%
2102	2-Sep	79	45	38	27	19	6	2	13	229	37.2%
2103	1-Sep	164	36	131	38	145	37	18	3	572	16.0%
2104	26-Aug	162	105	87	46	105	23	27	15	570	24.7%
2105	23-Aug	99	6	45	10	72	157	23	23	435	25.6%
2106	19-Aug	316	301	252	183	154	67	37	80	1390	10.0%
2107	26-Aug	58	66	16	27	14	0	0	33	214	30.8%
2108	29-Aug	68	66	11	34	44	12	5	50	290	22.0%
2109	5-Sep	89	72	16	45	65	35	30	51	403	24.6%
2201	12-Sep	962	110	67	220	101	29	15	38	1542	14.2%
3110	26-Aug	72	39	10	8	19	0	0	8	156	69.6%
3113	30-Aug	20	22	12	11	15	1	5	4	90	52.3%
3114	1-Sep	102	58	55	50	102	9	21	0	397	29.6%
3201	10-Sep	144	33	15	41	15	0	0	7	255	78.0%
3203	14-Sep	114	13	67	56	175	138	222	1	786	26.6%
4116	7-Sep	29	20	9	18	43	0	0	3	122	80.8%

## (2) Cargo Loading

Container trucks accounted for 3.4% of the total trucks. Excluding container trucks, two-third of trucks were full loaded, while empty trucks accounted for 27% as shown in Table A-19. According to this result, all trucks are full loaded or empty.

**Table A-19 Cargo Loading of Trucks (excluding container trucks)**

Empty	1/4	1/2	3/4	Full
27.0%	1.1%	2.8%	2.5%	66.6%

Truck traffic on N-5 showed different tendencies than the national average mentioned above. Container trucks accounted for 7.9% along N-5 in average. Excluding container trucks, the percentage of the full loaded trucks along N-5 was higher than the average; it accounted for 74.8% while the empty trucks along N-5 accounted for 19.5%. This means that N-5 plays an important role in freight transport in Pakistan.

There was observed a different feature between “up-country” traffic and “down country” traffic along N-5 in the percentage of the full loaded trucks. In case of “up-country” traffic, full loaded trucks accounted for 83.0%, while the percentage was 66.8% in case of “down –country” traffic, as shown in Table A-20.

**Table A-20 Cargo Loading of Trucks on N-5 (excluding container trucks)**

	Empty	1/4	1/2	3/4	Full
N-5	19.5%	0.9%	2.3%	2.5%	74.8%
Up	12.6%	0.5%	2.0%	1.9%	83.0%
Down	26.2%	1.3%	2.7%	3.0%	66.8%

## (3) Commodities Carried by Trucks

The major commodities carried by trucks were agricultural products, such as fruits, animals, wheat, vegetables, potatoes, and onions, as shown in Table A-21. Other major commodities carried by trucks were: ballast, gravel, and stone; general merchandize; cement; diesel; flour and its preparations including biscuit & bakery products; and so on.

**Table A-21 Composition of Commodities Carried by Trucks**

Agriculture, food, fish, forest & L/stock products	Row Materials	Bulk Manufactures	Basic Manufactures	Miscellaneous Manufactures	Mining and Quarrying	Fuel, Lubricant	MISC. goods not classified
35.2%	3.3%	11.2%	14.1%	12.7%	9.6%	11.8%	2.0%
-Fruits -Animals -Wheat -Vegetables - Potatoes & Onions	- Timber, logs, -Scraps	- Cement, - Fertilizer	- Flour - Bricks - Iron & Steels	- General merchandize	- Ballast, gravel, stone	-Diesel - Fire wood, charcoal - Coal, cock briquette	-Household effects

Remark: No answer excluded.

## (4) Vehicle Occupancy

It is commonly observed that buses are overcrowded in Pakistan. The result of the RIS shows the same tendency: a fifth of buses carried more passengers than the number of seats. The average occupancy rate of buses was high at 0.93. The average number of seats of minibuses was 18.6, while that of large buses was 49.1 and that of the total buses was calculated at 31.8.

### **A.6.3 The result of Cargo O/D Survey at Inland Container Depot**

#### **(1) Traffic Volume**

Traffic volume from/ to ICDs was 245 trucks at Lahore ICD (30-Aug) and 251 trucks at Faisalbad ICD (2-Sep), while that from/to Karachi Port and Qasim Port was similar volume at 206 trucks and 244 trucks, respectively. Traffic volume of other ICDs was relatively small at 10 (Rawalpindi, 6-Sep), 24 (Multan, 10-Sep), 33 (Hyderabad, 31-Aug) and 43 (Peshawar, 1-Sep).

#### **(2) Origin/ Destination of Interviewed Trucks**

Table A-22 shows the result of O/D interview of ICD. It can be said that O/D represents catchment area for the container depots.

Traffic from/to Lahore ICD concentrated on Lahore (23 of 34).

The major O/D of Karachi Port was Peshawar (9 of 88), Faisalbad (14), Multan (16), Quetta (14), Sukkur (9), and Hyderabad (9).

Iran was the major O/D of Quetta ICD on 5 September (24 of 52). Other major O/Ds were Lahore (8), Multan (8), and Faisalabad (5).

Karachi was the major O/D of Peshawar ICD, Multan ICD, and Rawalpind ICD.

Hyderabad ICD had various O/D in Panjab and Sind.

Port Qasim showed the similar pattern of Karachi Port. The major O/D was Lahore (14 of 100), Multan (14), Sukkur (11), Hyderabad (13), and Quetta (13).

Faisalabad and Karachi were the major O/D of Faisalabad ICD (13/33 and 17/33).

At Sialkot ICD, Karachi was the major O/D (9 of 20), followed by Islamabad (4).

**Table A-22 O/D of ICDs, Number of Samples, and Traffic Volume at Gates**

<b>01 Lahore</b>		<b>30-Aug, 2005 (Tue.)</b>	
Origin/ Destination	Inbound	Outbound	Total
Rawalpindi		1	1
Faisalabad	1		1
Sheikhupura	3	1	4
Lahore	8	15	23
Kasur	1	1	2
Karachi		2	2
No. of Samples	14	20	34
Total Traffic	126	119	245
Sampling Rate	11.1%	16.8%	13.9%

<b>02 Karachi Port</b>		<b>3-Sep, 2005 (Sat.)</b>	
Origin/ Destination	Inbound	Outbound	Total
Peshawar	3	6	9
Mianwali	2	2	4
Faisalabad	9	5	14
Multan	10	6	16
D.I. Khan		2	2
R. Y. Khan	1		1
Sukkur	5	4	9
Jacobabad	1		1
Hyderabad	6	3	9
Quetta	9	5	14
No. of Samples	50	38	88
Total Traffic	107	99	206
Sampling Rate	46.7%	38.4%	42.7%

**03 Quetta**

**5-Sep, 2005 (Mon.)**

Origin/ Destination	Inbound	Outbound	Total
Peshawar	1	1	2
Faisalabad	2	3	5
Lahore	3	5	8
Gujranwala	1		1
Sialkot	1		1
Multan	4	4	8
Karachi	1	2	3
Iran	14	10	24
No. of Samples	27	25	52
Total Traffic	N.A.*	40	N.A.
Sampling Rate	--	62.5%	--

\* The subcontractor failed to record the total number of inbound trucks.

**04 Peshawar**

**1-Sep, 2005 (Thu.)**

Origin/ Destination	Inbound	Outbound	Total
Peshawar		1	1
D. I. Khan	1		1
Swat	1		1
Rawalpindi	1		1
Lahore	2	2	4
Sheikhupura	1	1	2
Hyderabad		1	1
Karachi	13	6	19
Quetta		1	1
No. of Samples	20	12	32
Total Traffic	23	20	43
Sampling Rate	87.0%	60.0%	74.4%

**05 Multan**

**10-Sep, 2005 (Sat.)**

Origin/ Destination	Inbound	Outbound	Total
Multan		1	1
Bahawalpur	1		1
Karachi	7	7	14
No. of Samples	8	8	16
Total Traffic	13	11	24
Sampling Rate	61.5%	72.7%	66.7%

**06 Rawaplindi**

**6-Sep, 2005 (Tue.)**

Origin/ Destination	Inbound	Outbound	Total
Karachi	9	1	10
No. of Samples	9	1	10
Total Traffic	9	1	10
Sampling Rate	100%	100%	100%

**07 Hyderabad**

**31-Aug, 2005 (Wed.)**

Origin/ Destination	Inbound	Outbound	Total
Mianwali	1		1
Faisalabad	1	1	2
Lahore	2		2
Okara	1		1
Multan	1		1
Sahiwal	1		1
D. G. Khan		1	1
Muzaffargarh		1	1
R. Y. Khan	1		1
Sukkur	1	2	3
Nawabshah		1	1
Ghotki	1		1
Larkhana		1	1
Jacobabad	1		1
Karachi		1	1
Sibi	1		1
No. of Samples	12	9	21
Total Traffic	12	21	33
Sampling Rate	100%	42.9%	63.6%

**08 Port Qasim**

**3-Sep, 2005 (Sat.)**

Origin/ Destination	Inbound	Outbound	Total
Peshawar	1	5	6
Rawalpindi		1	1
Mianwali		1	1
Faisalabad	2	5	7
Lahore	11	3	14
Multan	8	6	14
D. G. Khan	3	2	5
Muzaffargarh		3	3
Bahawalpur		1	1
Bahawalnagar		1	1
R. Y. Khan		4	4
Sukkur	7	4	11
Ghotki		2	2
Jacobabad		1	1
Hyderabad	9	4	13
Dadu	1	2	3
Quetta	8	5	13
No. of Samples	50	50	100
Total Traffic	106	138	244
Sampling Rate	47.2%	36.2%	41.0%

**09 Faisalabad**

**2-Sep, 2005 (Fri.)**

Origin/ Destination	Inbound	Outbound	Total
Sargodha		1	1
Faisalabad	12	1	13
Sheikhupura	2		2
Karachi	2	15	17
No. of Samples	16	17	33
Total Traffic	147	104	251
Sampling Rate	10.9%	16.3%	13.1%

<b>10 Sialkot</b>		<b>19-Sep, 2005 (Mon.)</b>		
Origin/ Destination	Inbound	Outbound	Total	
Peshawar	2		2	
Islamabad	1	3	4	
Sialkot	2		2	
Lahore	1	2	3	
Karachi	4	5	9	
No. of Samples	10	10	20	
Total Traffic	98	98	196	
Sampling Rate	10.2%	10.2%	10.2%	

#### **A.6.4 Cross-border Traffic Survey**

##### **(1) Traffic Volume and Interview Sampling**

Traffic volume at the borders was very small as shown in Table A-23. At Wagha, the border with India near Lahore, it was only 11 trucks. Traffic volume at Taftan, Iranian border, was also small at 29 trucks. Tractor/Trailer was the major mode at Sust, the border with China, counted 34 of 51. Chaman, the border with Afghanistan near Quetta, had 63 trucks. Differently, traffic volume amounted to 401 vehicles at Torkhan (the border with Afghanistan near Peshawar), including 67 passenger cars and 138 tractors/trailers.

**Table A-23 Number of Vehicles Counted at Cross Borders**

Site	Date	Car	Minibus	Bus	Light Truck	2-Axle Truck	3-Axle Truck	Trailer/Tractor	Total
Sust	5-Sep	0	4	2	9	1	1	34	51
Wagha	30-Aug	0	0	0	0	3	7	1	11
Torkhan	3-Sep	27	16	24	91	86	19	138	401
Taftan	8-Sep	0	0	0	4	4	21	0	29
Chaman	6-Sep	0	0	0	16	10	36	1	63

The number of vehicles interviewed was 214 in total, and the number by site is shown in Table A-24. Only trucks were interviewed. Most of all Tractors/Trailers were container trucks.

**Table A-24 Number of Vehicles Interviewed at Cross Borders**

Site	Date	Car	Minibus	Bus	Light Truck	2-Axle Truck	3-Axle Truck	Trailer/Tractor	Total
Sust	5-Sep				3		1	32	36
Wagha	30-Aug					3	7	1	11
Torkhan	3-Sep				31	22	9	38	100
Taftan	8-Sep				4	3	16		23
Chaman	6-Sep				6	7	29	2	44

##### **(2) O/D of Cross-border Traffic**

O/D data from the survey at cross-borders are shown in Table A-25. Container trucks from/to Karachi accounted for about 20% at Sust. Although the number of samples was too small at Wagha, 50% of trucks had O/D in Quetta. Peshawar was the major O/D of Torhan, while Quetta was the major O/D of Chaman and Taftan.



**Table A-25 O/D of Truck by International Border**

<b>Sust (Border with China)</b>					<b>5-Sep (Mon.)</b>
O/D	Light Truck	2-Axle Truck	3-Axle Truck	Tractor/Trailer	Total
Gilgit Northern Area	1		1	9	11
Mansera				3	3
Islamabad				1	1
Rawalpindi				6	6
Faisalabad				1	1
Lahore	1			4	5
Hyderabad	1				1
Karachi				8	8
<b>Total</b>	<b>3</b>		<b>1</b>	<b>32</b>	<b>36</b>

<b>Wagha (Border with India)</b>					<b>30-Aug (Tue.)</b>
O/D	Light Truck	2-Axle Truck	3-Axle Truck	Tractor/Trailer	Total
Peshawar		2		1	3
Nowshera		1	1		2
Quetta			6		6
<b>Total</b>		<b>3</b>	<b>7</b>	<b>1</b>	<b>11</b>

<b>Torkhan (Border with Afghanistan near Peshawar)</b>					<b>3-Sep (Sat.)</b>
O/D	Light Truck	2-Axle Truck	3-Axle Truck	Tractor/Trailer	Total
Peshawar	29	15	6	35	85
Nowshera		2	1		3
Mardan		1			1
D. I. Khan		1	1		2
Rawalpindi	1	1			2
Lahore	1	2	1	2	6
Karachi				1	1
<b>Total</b>	<b>31</b>	<b>22</b>	<b>9</b>	<b>38</b>	<b>100</b>

<b>Taftan (Border with Iran)</b>					<b>8-Sep (Thu.)</b>
O/D	Light Truck	2-Axle Truck	3-Axle Truck	Tractor/Trailer	Total
Sukkur			1		1
Quetta	4	3	15		22
<b>Total</b>	<b>4</b>	<b>3</b>	<b>16</b>		<b>23</b>

<b>Chaman (Border with Afghanistan near Quetta)</b>					<b>6-Sep (Tue.)</b>
O/D	Light Truck	2-Axle Truck	3-Axle Truck	Tractor/Trailer	Total
Karachi			3	1	4
Quetta	3	4	24	1	32
Qila Abdullah	3	3	2		8
<b>Total</b>	<b>6</b>	<b>7</b>	<b>29</b>	<b>2</b>	<b>44</b>

### A.6.5 Passenger Interview Survey

#### (1) Income Level

Railway passengers and bus passengers have a similar attribution in terms of income level, while air passengers show different income distribution as shown in Figure A-3. The income level of bus passengers is slightly higher than that of railway passengers, but more than 90% of bus and rail passengers have less than Rs. 20,000 as monthly income. On the other hand, over 50% of air passengers have more than Rs. 20,000, and about 30% of them have more than Rs. 50,000.

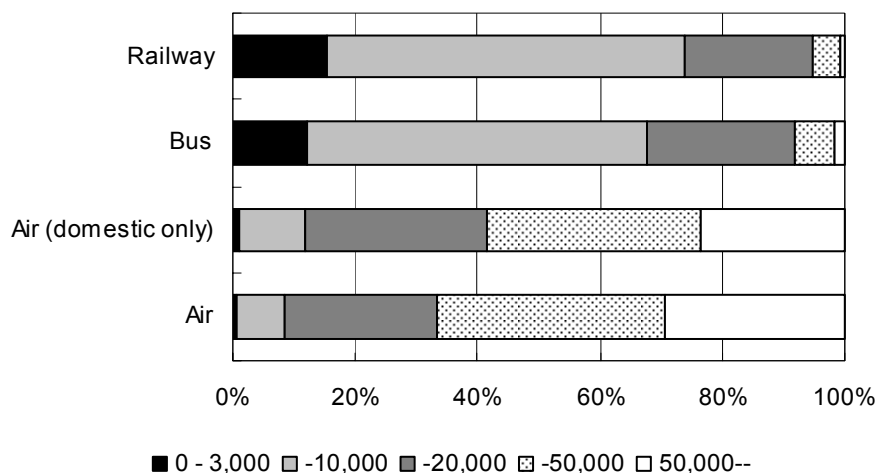


Figure A-3 Income Distribution of Passengers (Monthly Income)

#### (2) Origin and Destination

Figure A-4, Figure A-5 and Figure A-6 show O/D of interviewees at airports, bus terminals, and railway stations. Foreign origin and destination are not represented in Figure A-4. The passenger interview survey obtained air passengers of Peshawar - Karachi, Rawalpindi - Karachi, Lahore - Karachi, Islamabad - Lahore, and so on.

O/D of bus passengers distributed over provincial area as shown in Figure A-5. For example, the major O/D of passengers at Lahore Bus Terminal was within Panjab Province. The survey obtained bus passengers between Karachi and Peshawar/ Islamabad/ Rawalpindi.

O/D of railway passengers distributed along railway lines as shown in Figure A-6.

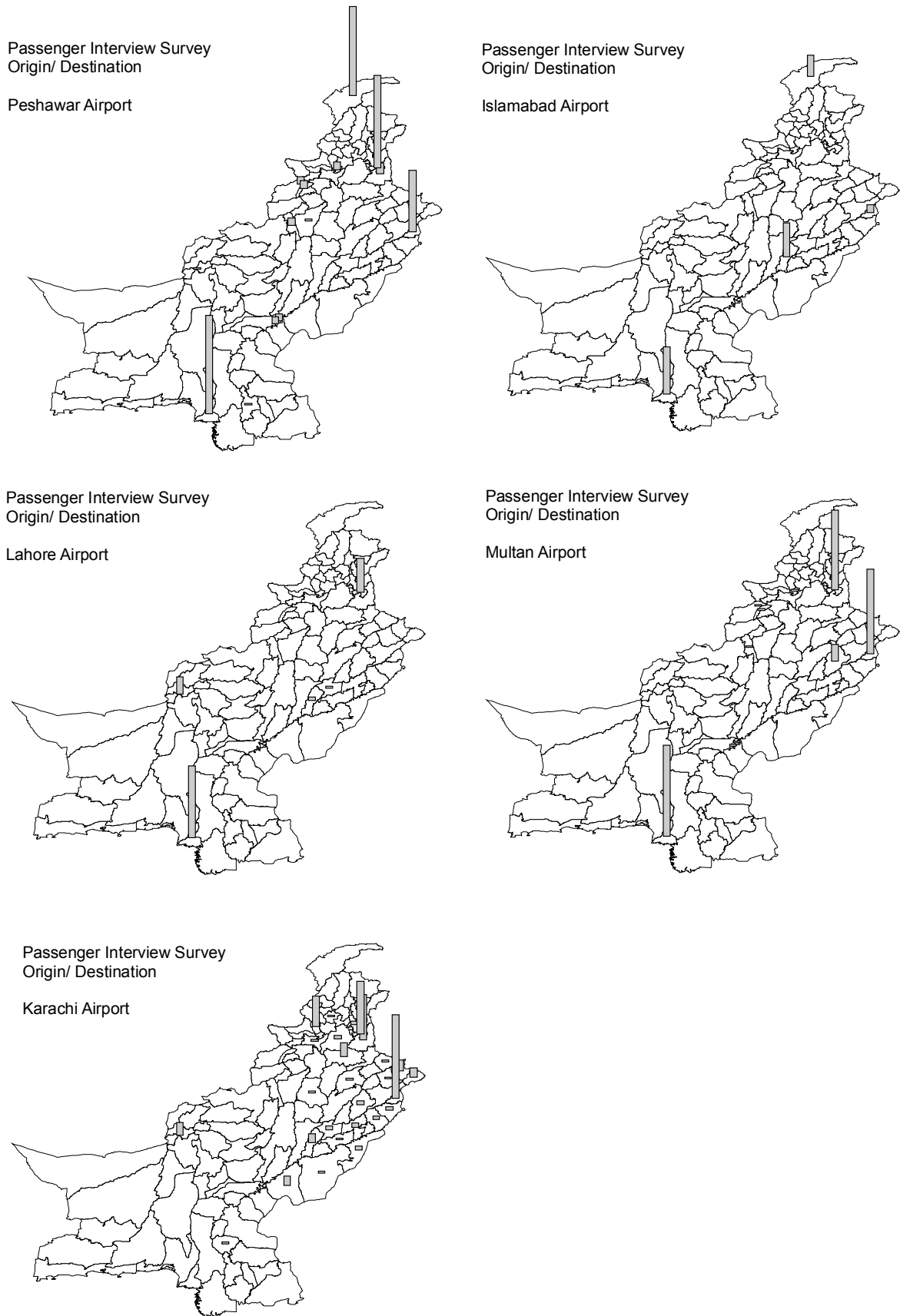
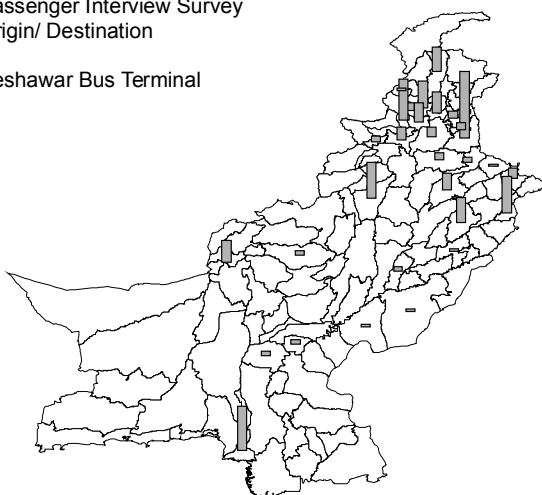


Figure A-4 Origin/ Destination of Interviewees at Airports

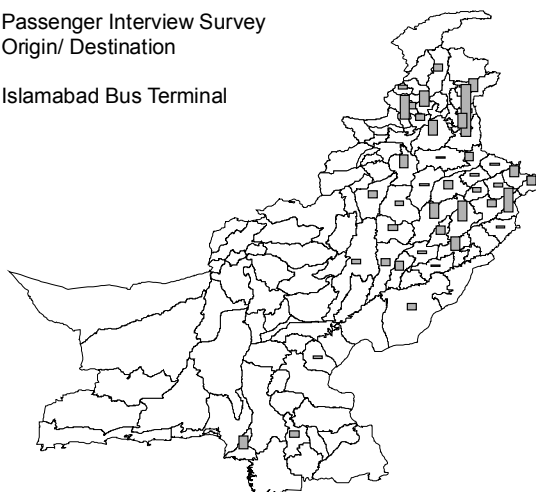
Passenger Interview Survey  
Origin/ Destination

Peshawar Bus Terminal



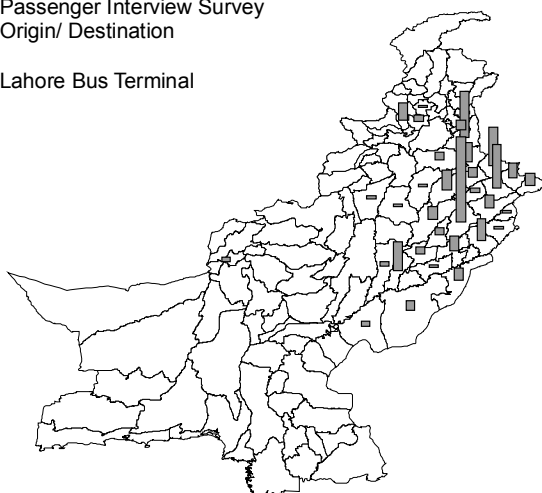
Passenger Interview Survey  
Origin/ Destination

Islamabad Bus Terminal



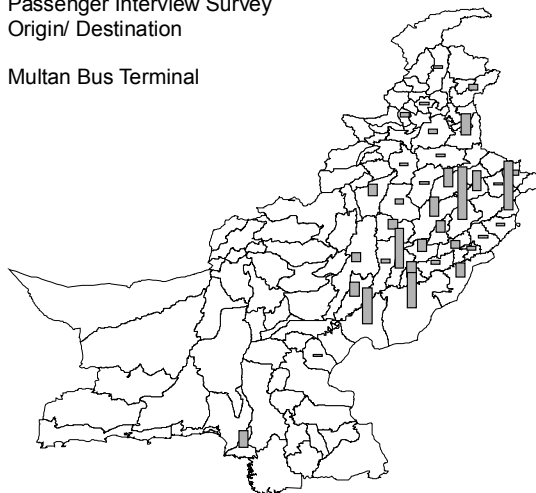
Passenger Interview Survey  
Origin/ Destination

Lahore Bus Terminal



Passenger Interview Survey  
Origin/ Destination

Multan Bus Terminal



Passenger Interview Survey  
Origin/ Destination

Karachi Bus Terminal

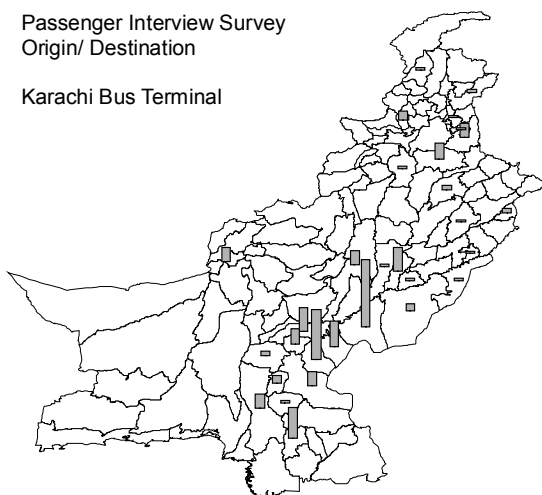
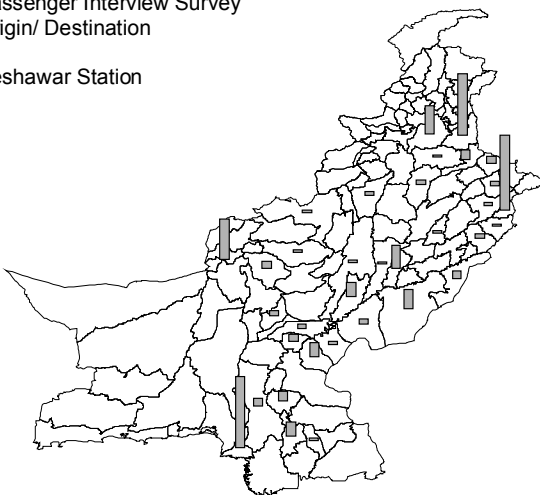


Figure A-5 Origin/ Destination of Interviewees at Bus Terminals

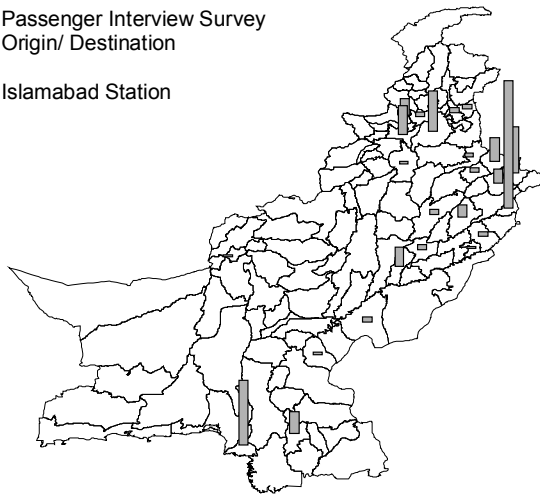
Passenger Interview Survey  
Origin/ Destination

Peshawar Station



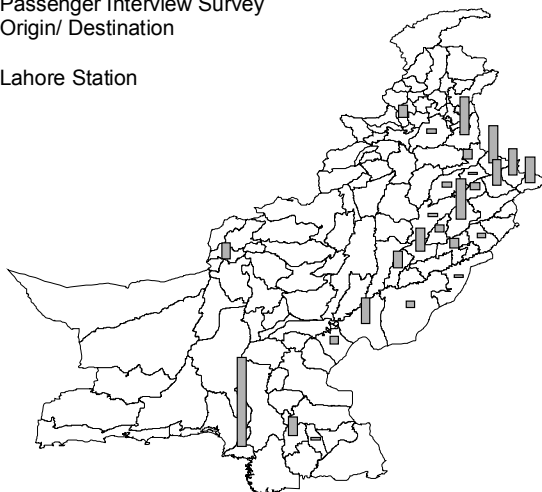
Passenger Interview Survey  
Origin/ Destination

Islamabad Station



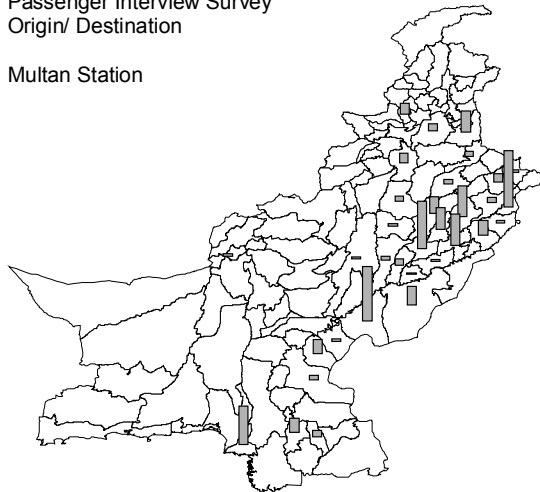
Passenger Interview Survey  
Origin/ Destination

Lahore Station



Passenger Interview Survey  
Origin/ Destination

Multan Station



Passenger Interview Survey  
Origin/ Destination

Karachi Station

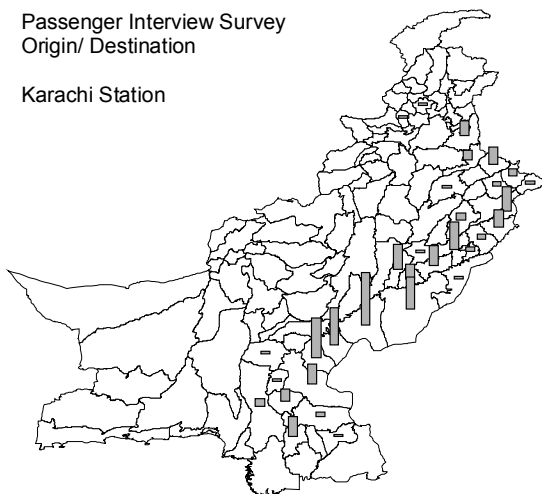


Figure A-6 Origin/ Destination of Interviewees at Railway Stations

### (3) Trip Purpose

Trip purpose showed the similar pattern among air, bus and railway passengers as shown in Figure A-7. A half of trips were the trips for going home. Work and business Trips accounted for about 30%. The percentage of Trips to Visit Relatives accounted for 17% of railway passengers, 14% of bus passengers, and 10% of air passengers. Education Trip was small at 3-4%. Shopping and Recreation/Leisure accounted for only 2-4%.

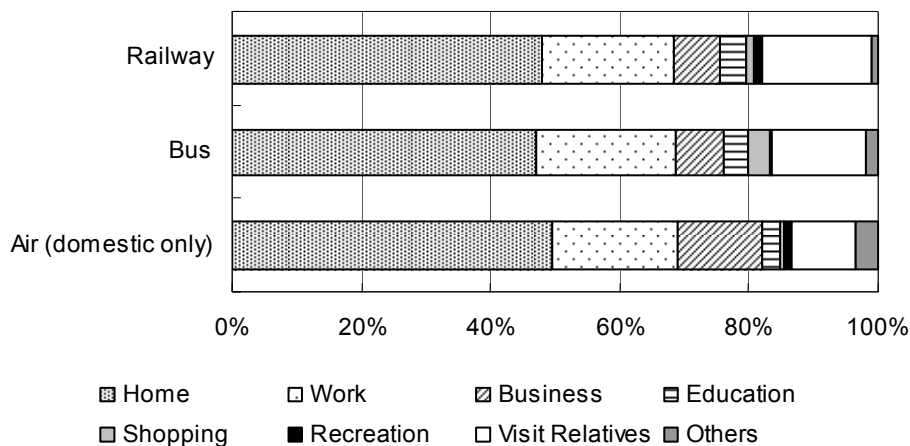


Figure A-7 Trip Purpose (origin and destination)

### (4) Access Transport

The composition of transport modes to/from airports, bus terminals and railway stations is illustrated in Figure A-8. At bus terminals, bus-to-bus transfer accounted for about 50%, while bus-to-rail or rail-to-bus at railway stations accounted for 36%. Public transport (bus+Taxi/Rickshaw) accounted for 80% of access transport mode to/from bus terminals and railway stations, while it was 60% at airports. Private Transport accounted for 38% at airports, 5% at bus terminals, and 10% at railway stations.

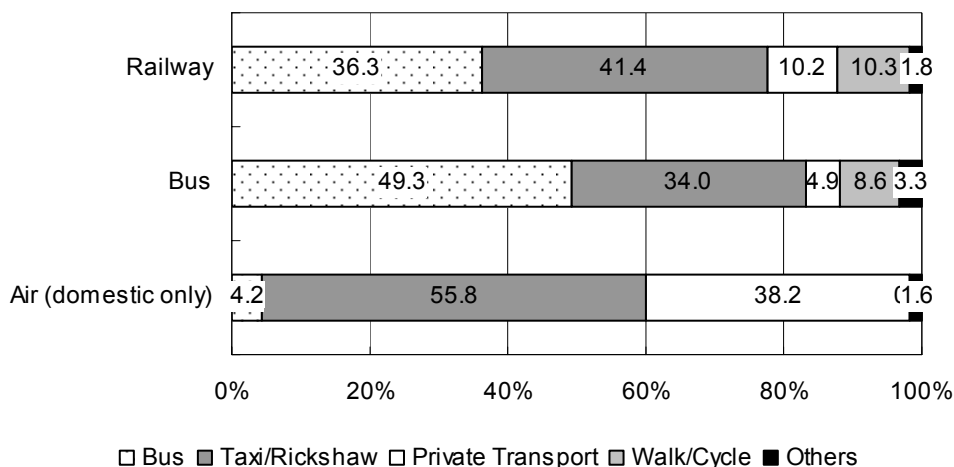


Figure A-8 Transport Mode to/from Airport, Bus Terminal, and Station

## A.6.6 Long-Distance Bus Survey

### (1) Bus Type

The total number of the selected Mini Bus (up to 20 seats) was 206 and that of Large Bus (over 40 seats) was 1,210. Large Bus (Over 40 seats) accounted for 85.5% in total as shown in Table A-26. At Sukkur, the number of Mini Bus selected for the survey was larger than that of Large Buses.

**Table A-26 Bus Type**

Site	Mini Bus	%	Large Bus	%	Total
Peshawar	1	1.0	99	99.0	100
Islamabad	27	15.0	153	85.0	180
Lahore	38	19.8	154	80.2	192
Faisalabad	10	3.9	246	96.1	256
Multan	22	13.2	145	86.8	167
Hyderabad	5	5.1	93	94.9	98
Karachi	0	0.0	100	100.0	100
Quetta	19	19.0	81	81.0	100
Bahawalpur	31	25.2	92	74.8	123
Sukkur	53	53.0	47	47.0	100
Total	206	14.5	1210	85.5	1416

The average number of seats (capacity) was 27.9 (Mini Bus) and 52.7 (Large Buses).

### (2) Operator

Owner Operator accounted for 36% of Mini Buses, 24% of Large Buses and 26% of all buses as shown in Table A-27.

**Table A-27 Operator**

Type	Owner Operator	Company	Unknown	Total
Mini Bus	74 (35.7%)	132 (63.8%)	1	207
Large Bus	294 (24.3%)	914 (75.6%)	1	1,209
Total	368 (26.0%)	1,046 (73.9%)	2	1,416

### (3) Origin and Destination

Figure A-9 and Figure A-10 illustrate the origin and destination of the buses selected for the survey. The origins and destinations of Peshawar, Islamabad, Quetta, and Karachi spread over Pakistan. The O/Ds of Lahore, Faisalabad, Multan and Bahawalpur distributed over Panjab Province and that of Hyderabad and Sukkur distributed over Sind Province.

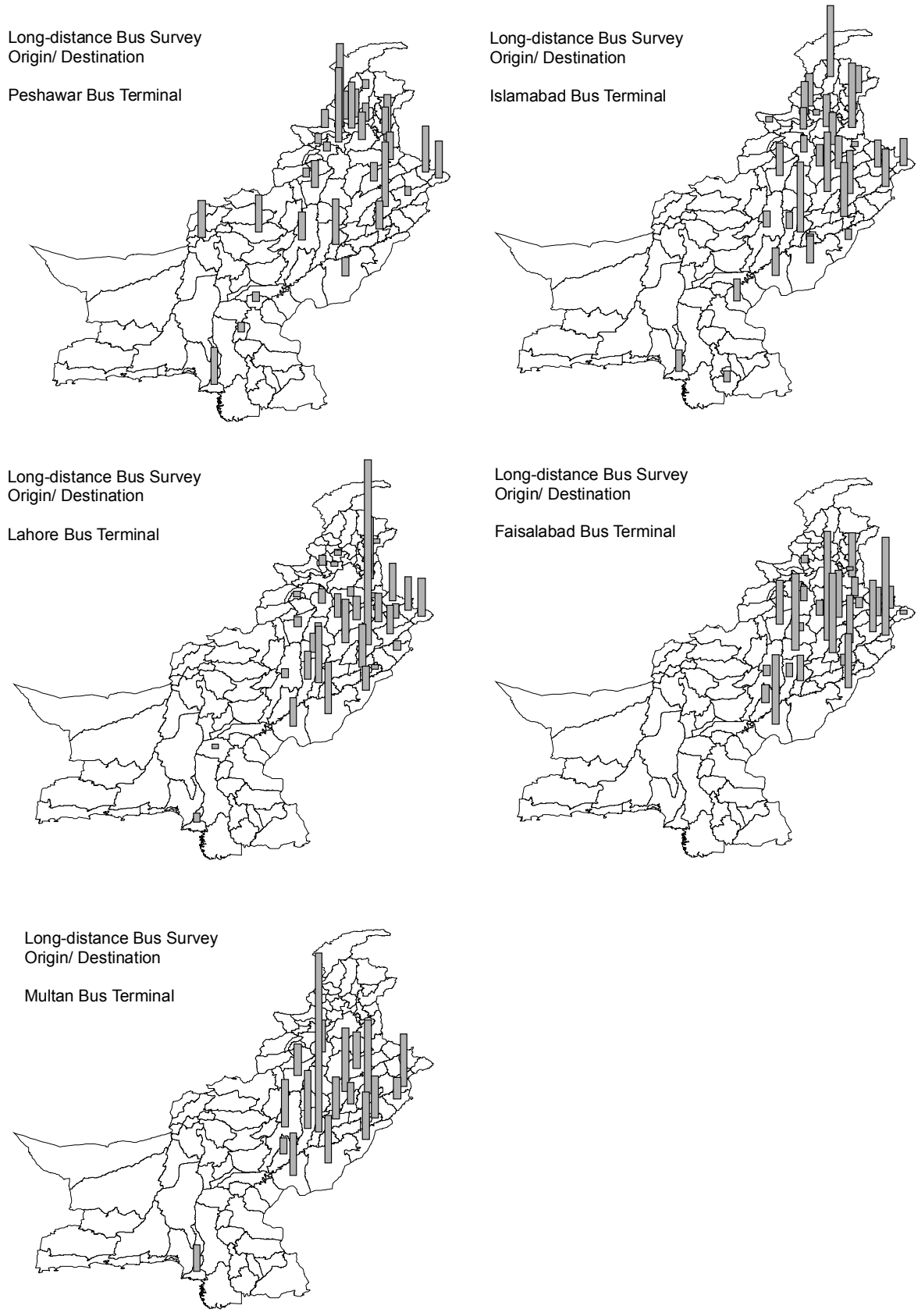
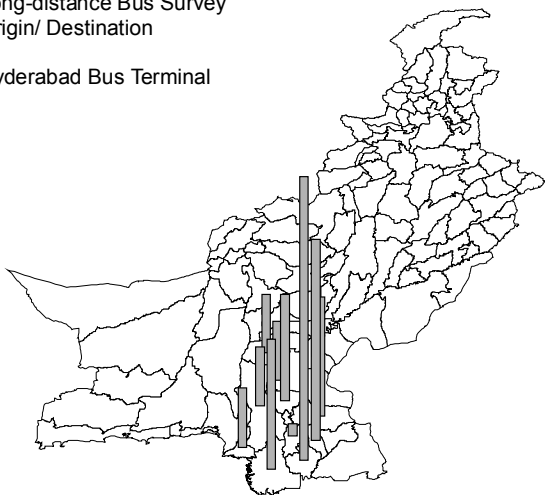


Figure A-9 O/D of Long-distance Bus (1)



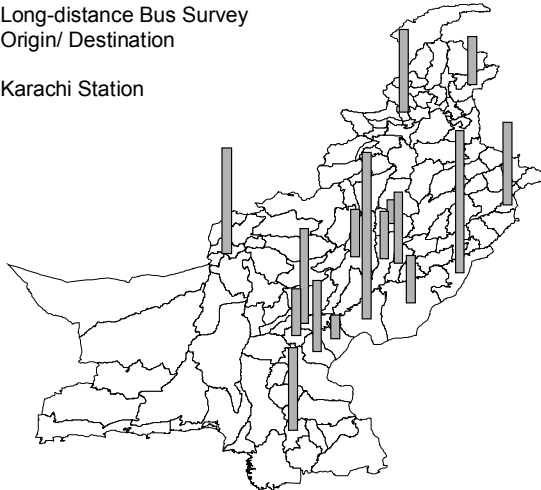
Long-distance Bus Survey  
Origin/ Destination

Hyderabad Bus Terminal



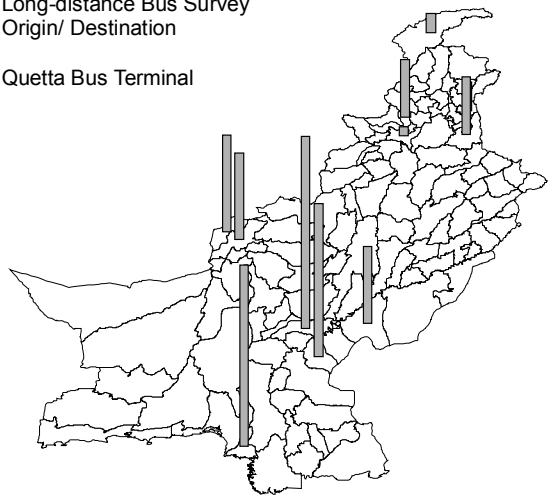
Long-distance Bus Survey  
Origin/ Destination

Karachi Station



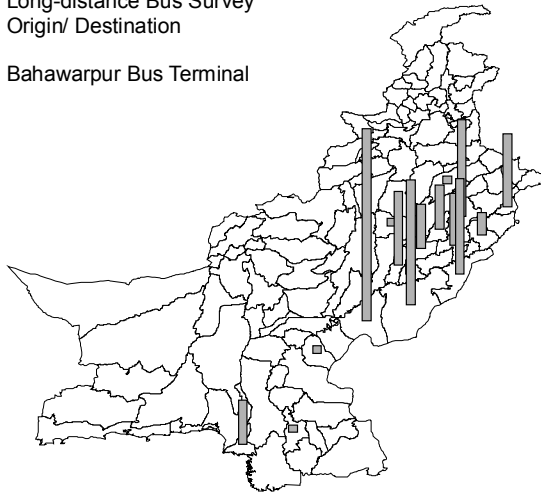
Long-distance Bus Survey  
Origin/ Destination

Quetta Bus Terminal



Long-distance Bus Survey  
Origin/ Destination

Bahawarpur Bus Terminal



Long-distance Bus Survey  
Origin/ Destination

Sukkur Bus Terminal

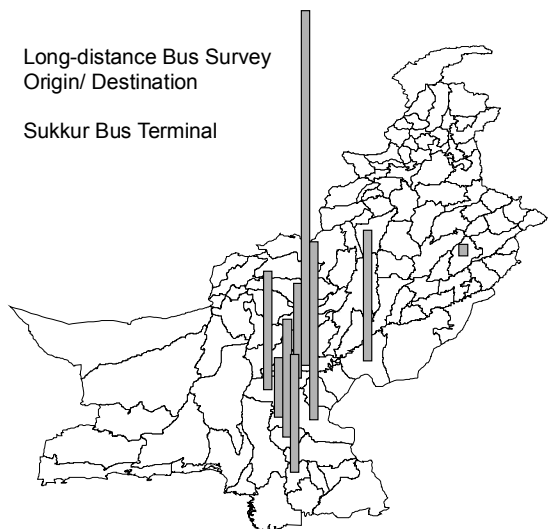


Figure A-10 O/D of Long-distance Bus (2)

#### **(4) Travel Time**

Table A-28 shows travel time distribution of Mini Buses and Large Buses. Mini Buses whose travel time was less than eight hours accounted for over 90% of all Mini Buses. Travel time of Large Buses was longer than that of Mini Buses. Travel time exceeded 24 hours for long distance trips such as Karachi – Peshawar, Quetta-Chitral, Quetta – Peshawar, and so on.

**Table A-28 Travel Time Distribution**

Travel Time	Mini Bus	Large Bus	Total
Less than 1 hour	10 (4.9%)	33 (2.7%)	43 (3.0%)
1 – 2 hours	75 (36.4%)	142 (11.7%)	217 (15.3%)
2 – 5 hours	108 (52.4%)	421 (34.8%)	529 (37.4%)
5 – 8 hours	6 (2.9%)	334 (27.6%)	340 (24.0%)
8 – 12 hours	2 (1.0%)	148 (12.2%)	150 (10.6%)
12 – 18 hours	2 (1.0%)	89 (7.4%)	91 (6.4%)
18 – 24 hours	0	28 (2.3%)	28 (2.0%)
More than 24 hours	3 (1.5%)	15 (1.2%)	18 (1.3%)

#### **(5) Bus Fare**

Based on the survey, bus fare among major cities are summarised in Table A-29, with train fare of Pakistan Railway for references. Bus fare between Karachi and Rawalpindi was Rs. 900, while train fare between Karachi Station and Rawalpindi Station was Rs. 1,080 (First Class) and Rs. 590 (Economy Class). As a whole, bus fare is cheaper than the fare of first class train but more expensive than that of economy class train.

**Table A-29 Bus Fare among Major Cities**

O/D Pair	Fare	No. of Intermediate Stop	Railway (*)		Remark
			First Class	Economy Class	
Karachi – Peshawar	Rs. 700	8	Rs. 1,080	Rs. 590	via.Sher Shah-Attock City
Karachi – Rawalpindi	Rs. 900	6 - 18	Rs. 1,070	Rs. 590	via.MUL-FSLD-WZD
Karachi – Lahore	Rs. 800	6 - 15	Rs. 930	Rs. 510	via.Multan-Kanewal
Karachi – Quetta	Rs. 350	2	Rs. 710	Rs. 350	via.Rohri
Karachi – Multan	Rs. 500	Non-stop	Rs. 740	Rs. 390	
Peshawar – Lahore	Rs. 250	1	Rs. 390	Rs. 190	
Peshawar – Quetta	Rs. 700	Non-stop	Rs. 930	Rs. 510	via ATCY-KDA-DGK
Rawalpindi – Lahore	Rs. 250	1	Rs. 270	Rs. 140	
Rawalpindi – Quetta	Rs. 1100	Non-stop	Rs. 910	Rs. 500	via GLR-BOS-ADK

(\*) Source: “TIME & FARE TABLE FROM 15<sup>TH</sup> MAY, 2005 TO 14<sup>TH</sup> OCT, 2005”, Pakistan Railway

### A.6.7 The PTPS O/D Survey

The O/D Survey in PTPS is the fourth country-wide O/D Survey and the first O/D Survey conducted by JICA, having different features from the previous surveys as follow:

Cordon Line Survey – The survey sites were selected in a manner that all traffic exiting from and entering into cordon lines were able to be caught. Therefore, some districts were merged into a traffic zone when there are many roads crossing boundary of districts.

Focus on Rural Development – PTPS considers not only economic development at national level but also poverty reduction and rural development. Compared to national roads, rural roads are in extremely poor condition. Therefore, the survey sites were selected not only major highways but also minor roads in rural areas.

Subcontract Survey – The previous surveys were carried out by NTRC with its own human resources. On the other hand, the O/D Survey in PTPS was carried out by JICA Study Team with a private survey company in Pakistan. It required adequate monitoring system over the survey in order to obtain accurate data.

Short Period – In previous survey, the master plan was formulated after the completion of the surveys. On the other hand, in PTPS the Traffic Survey was conducted simultaneously with formulation of master plan. Therefore, the survey schedule was notably short compared to previous surveys, and only one-round survey was conducted.

Advanced Technology – One of the most significant differences from the previous surveys is change in computer technology and other information technology. Mobile phone was a powerful tool to communicate in the survey team. Fax and e-mail played an important role to send survey reports soon after a survey was finished. So did courier services over the country. A number of computers shortened the time for data entry.