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PLANNING AND DEVELOPMENT DIVISION  
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PILOT ORIGIN-DESTINATION SURVEY  
AT MILE 11 LAHORE - MULTAN ROAD  
ON 21ST OCTOBER, 1975

NTRC-4

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January, 1976

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## FOREWORD

The lack of adequate road traffic data is one of the major handicaps in the way of proper transport planning and coordination. The large capital requirements for infrastructure and facilities and resource constraints require that major investment decisions should be made more objectively on economic considerations. Due to increasing complexity of spatial relationships as a result of economic growth, policies of regional development and other socio-economic considerations, the need for such detailed information as the direction and volume of major flows of various categories of goods and passenger traffic cannot be over-emphasised for network planning, inter-modal distribution and other investment and pricing policies.

The Origin-Destination Surveys are one of the most versatile source to provide basic essential information of multipurpose use. Unfortunately, no such country-wide survey has been undertaken in the past except the one conducted under the Transport Coordination Project in 1968-70 which was of limited scope and coverage and was intended to serve as a model for more extensive and wider survey which is now overdue.

For any survey of the type, a Pilot Study is an essential statistical requirement. The small survey undertaken by the National Transport Research Centre meets this requirement. It has provided the primary questionnaire and a tentative tabulation plan which can be expanded as more data is collected. The forms and procedures finalized on the basis of actual field test would be useful for undertaking Road Traffic Origin-Destination Surveys by various agencies both at regional and national scales.

V. A. JAFAREY,  
Secretary.

Islamabad, January, 1976.

## PREFACE

A Pilot Study was undertaken by the National Transport Research Centre in collaboration with the Highway Department and the Bureau of Statistics, Government of Punjab, for the purposes of developing a Standard Questionnaire, Uniform Procedures and a tentative Tabulation Plan for Road Traffic Origin-Destination Surveys for the country.

2. The Survey covered only one road for four hours during which all mechanized vehicles were interviewed and goods vehicles were actually weighed at the Octroi Post Weighing Bridge. Non-mechanized vehicles were not covered. The results of the Survey are presented in this Report.

3. As the main objective was to test forms and procedures, the questionnaire, definitions, instructions and procedures to be followed for filling in the form and a tentative tabulation plan have been finalized. The data contained in the tabulations in this report mainly serves the purpose of illustration. Conclusions cannot be derived from the data in the present form due to very small sample size, partial coverage and limited scope. Nevertheless, some of the results such as average load factors, proportionate distribution of local and Inter-District traffic, relationships between Gross and Rear Axle Loads etc. are useful even at this stage. The Tabulation Plan can be expanded as more data is collected.

4. A separate Report dealing with organizational and financial matters and a Manual for O-D Surveys will be published separately so that uniform methods and procedures could be adopted by various agencies undertaking such surveys.

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## ACKNOWLEDGEMENTS

This Survey was planned and organized by Mr. Abdul Majeed, Deputy Chief (Transport) and Chief (Transport Economist). The advice and assistance of the Director, Bureau of Statistics and Chief Engineer, Highways Punjab were available all the time. Mr. Mohammad Jamil Butt, Senior Systems Analyst of the Bureau of Statistics, Mian Naimuddin Ahmed and Mian Mahmood Ahmed, Assistant Directors, Planning and Design Directorate, Highway Department, were associated with all the stages of the Survey. They were responsible for organizing and undertaking the field work through their field staff and office employees of the Planning and Design Directorate. The data was compiled by the Bureau of Statistics, Lahore. The work done by all of them is gratefully acknowledged.



directions. A large board indicating the main questions which were to be asked was also placed just before the interview site so that respondents get prepared before hand. Such information signs are helpful in traffic surveys.

An Automatic Traffic Counting Machine was also installed near the survey site to cross-check the total number of vehicles interviewed with the number recorded by the machine.

Staff Employed:

For interviewing the vehicles, it was not possible for a single person to ask the questions and record information as well due to noise of engine and the distance between the driver and interviewer. One person asked questions and dictated information to the other. In all about 20 persons were busy in the survey work. These included three pairs of interviewers on each side of the road i.e. 12 persons, two supervisors four signalmen for stopping and allowing the vehicles to go and two survey coolies. In addition, 8 persons were deputed at the weighing bridge. With the modified form it might be possible for a single person to interview and record information where the volume of traffic is less.

The traffic survey staff of the Planning and Design Directorate of Highway Department which was specifically called from various places in the Province and the employees of the Planning & Design Directorate were present at the site for undertaking the field work and also for purposes of training and assistance.

A Police party was also posted at the site for help if any law and order problem arises, but no such problem occurred.

Training of Staff:

A brief one day's training was arranged for all the staff to be associated with the survey. The main objectives of the survey, precise questions to be asked, instructions for filling in the forms and procedures to be followed were briefly explained. Specimen copies of the questionnaire with written instructions were also provided and all these persons were required to fill in dummy forms for practice. The staff was again briefed before commencing the survey.

The Questionnaire:

The preliminary questionnaire was set in tabular form as shown at Annexure V. It contained all the information suggested by various agencies including type of vehicle, registration number, Number of passenger (male and female), origin-destination for all vehicles. In addition, the information concerning horse power, load and type of commodities carried was asked for goods vehicles only.

The goods vehicles were also weighed at the Octroi Post Weighing Bridge where special arrangements were made for this purpose. The Gross and Rear axle weight were recorded in form at Annexure VI.

It was observed at the early stage that the size of the form is very inconvenient to handle at the road side and recording of information takes more time. It was also observed that drivers were unable to indicate horse power for which they needed to consult registration books which were usually kept under lock and key and took time to take out. The enumerators were, therefore, asked to ignore this question if the answer was not readily forthcoming. The little information recorded indicates that most of the trucks are of standard specifications and their horse power and unladen weight are the same. This information can be retrieved from the computer record of the Punjab Bureau of Statistics and need not be included in the form.

The original questionnaire has been simplified with slight modifications in contents. The design has however been substantially changed. The questionnaire finalized for Origin-Destination Surveys and brief instructions for filling in the form are given in Annexure I & II respectively. The questionnaire has been designed for computer processing. The form would also be convenient for Manual Processing with slight modifications.

The proposed form consists of a small size booklet containing a covering page with 100 form which will be numbered for record and control purposes. Separate form will be filled in for each vehicle. The covering page will contain general information such as place, day, date, time, applicable for all vehicles.

The vehicle interview form includes information concerning type of vehicle, registration number, origin-destination load and type of commodities carried. The main features are explained below.

Vehicle Classification:

The vehicle classification contained in the form used for Pilot Survey identified 13 categories, corresponding to the classification used for tax purposes by the Bureau of Statistics. Enumerators were required to give code numbers for the type of vehicle which were provided on the top of the form. Although, initially some difficulty was felt in consulting the vehicle code numbers, but soon these were memorized. However, there are chances of error in recording the code number.

The classification has been found too elaborate. Those categories of vehicles, the numbers of which on inter-district roads are not statistically significant need not be separately classified. The vehicle classification has been modified as indicated on page 6 and self coded numbers have been provided in the revised form.

Registration Numbers:

The registration number of vehicle is not to be used in compilation. But still it has been provided for two purposes. One is to avoid bogus entries by enumerators when the supervision is not strict in far-flung areas and the second and more important purpose is that the Punjab Bureau of Statistics have on their computer record all the information contained, in the registration books in respect of vehicles registered in the Province of the Punjab. Any such information can be retrieved from there if the registration number is available.

Origin-Destination:

To determine origin and destination, the following questions were asked:-

- (i) Where did you start the journey?
- (ii) Did you stop on the way? If yes, for what purpose? If the purpose is related to business or work, the name of place was recorded.

- (iii) Where the journey will end?
- (iv) Would you stop on the way? If yes, for what purpose? If the purpose related to work or business, the name of place will be recorded.

The origin and destination were defined as the place journey starts or ends if there is no stop on the way. In case of stoppage on the way for business or work, the last and/or next business stop would be the origin or destination in accordance with the standard practice. Stops for rest, meals, fuel or service of vehicle etc. are ignored. The journeys can thus be classified into linked and through if required. For the goods vehicles the words "place journey started, ends, last and next stop" were replaced by "place goods loaded or unloaded" etc.

The elaboration of this question is necessary in order to avoid confusion concerning linked and through journeys which generally occurs in O-D surveys.

Type of commodities:

The additional questions regarding the type of commodities and load carried were also asked from goods vehicles only. In the case of empty vehicles, the type of commodity was either written nil or the space was crossed or left blank. In the case of more than one commodities, the first major commodity was recorded.

Net Load:

The net load carried indicated by the drivers was recorded without question. The accuracy of load indicated is to be verified from the records of actual weighing of trucks. This is being done. The results will be reported separately. However, the answers appear accurate in most of the cases where exact figures were indicated by drivers. This seems due to the fact that charges are based on loads.

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Response:

The cooperation received from vehicle operators was quite satisfactory. There was no case of refusal. However, one or two vehicles escaped interviews due to some confusion when there was a queue. On the whole the field work proceeded smoothly.

Time required for interviews:

Although the time required for interview and recording information varied depending upon the type of vehicle and response etc. but it took about half a minute to interview and record information for a bus and truck and still less time for other vehicles. However, the time involved on the part of vehicles was more due to slowing down, stopping and starting again.

Compilation of Data:

The filled in questionnaires were collected in the field. The number of vehicles interviewed at each hour were cross checked with the total number indicated by the automatic counting machine.

The data was compiled manually by the Bureau of Statistics, Punjab, Lahore who are expected to develop computer programmes for processing the data. The results of the survey are contained in the tables that follow the summary of results in the next section.

SUMMARY OF RESULTS

Table-1

Table 1 indicates the number of vehicles by district of origin and destination. In all 497 vehicles were intercepted during the 4 hour survey. Of these, 240 (48%) vehicles had their origin and destination within the district of Lahore. This is regarded as local and short distance traffic. The remaining 257 (52%) vehicles constituted inter-district traffic, out of this 245 (49%) vehicles had their origin or destination in Lahore district. The through or transit traffic between districts other than Lahore, and not requiring stop at Lahore was only 2% or 12 vehicles. This is the usual pattern of traffic for big cities.

The main traffic flows are shown below:

			<u>No. of vehicles</u>
Within Lahore District	-	-	240 (48%)
Lahore-Multan	-	-	91 (18%)
Lahore-Sahiwal	-	-	90 (18%)
Lahore-Bahawalnagar	-	-	16 (3%)
Lahore-D.G.Khan/Muzaffargarh	-	-	8 (2%)
Lahore-Bahawalpur/Rahim Yar Khan	-	-	4 (1%)
Lahore-Karachi	-	-	15 (3%)
Lahore-Quetta/Sibi	-	-	10 (2%)
Lahore-Khairpur/Hyderabad/Larkana	-	-	6 (1%)
Lahore-Lyallpur/Sheikhupura	-	-	5 (1%)
Transit/Through Traffic	-	-	12 (2%)
			<u>Total:- 497 (100%)</u>

Table-2:

Table 2 gives number of vehicles by type and passengers carried by hourly intervals. The average hourly traffic was

124 vehicles i.e. more than two vehicles every minute. The hourly variations are shown below:

0700-0800 hours	98
0800-0900 hours	125
0900-1000 hours	135
1000-1100 hours	139
Total:-	497
Average:-	124

The full significance of this table will appear when 24 hours counts are available.

The distribution of vehicles by type and average number of passengers is as below:

Type of Vehicle	No.	%	Av. No. of Passengers
Buses.. ..	183	(36.8)	40
Trucks.. ..	145	(29.2)	4
Cars .. ..	108	(21.7)	3
Station Wagons ..	11	( 2.2)	6
Jeeps .. ..	8	( 1.6)	4
Taxis .. ..	2	....	3
Rickshaws .. ..	1	....	2
Motor-cycle/Scooters ..	31	(6.2)	1.6
Tractor/Trailors ..	8	(1.6)	
Total:497			

The types of vehicles the numbers of which are proportionately not significant need not be classified separately. These should either be grouped with other categories or placed in a separate group of other vehicles.

Accordingly, the revised vehicle classification is proposed as below:

1. Buses.
2. Trucks, Trailers, Tractors.
3. Cars, Taxis, Jeeps.
4. Station Wagons, Mini Buses.
5. Motor-cycle, Scooters, Rickshaws.
6. Other vehicles.

The above classification has been self coded in the Revised Form.

Table-3:

Table 3 gives distribution of goods vehicles by type of commodities carried. Of the 145 trucks, 58 (40%) were empty and 97 (60%) were loaded. The major commodities carried were Stone, Bajri and Bricks (24 vehicles), Fruits and vegetables (14 vehicles), General Merchandize (8 vehicles), Fertilizers (7 vehicles), Live Stock (7 vehicles), Iron and Steel (6 vehicles). In the remaining commodity classes, there were only one or two vehicles.

The distribution of vehicles by major commodity groups is shown below:-

Commodity Class	No. of Vehicles	%
1. Agriculture .. .. .	24	(16.6)
2. Animal and Animal products ..	8	( 5.5)
3. Mining and Quarrying .. .. .	25	(17.2)
4. Manufactured goods .. .. .	30	(20.7)
5. Empty .. .. .	58	(40.0)
Total:-	145	(100.0)



Table 4:

Table 4 shows distribution of loaded goods vehicles by hourly interval. The proportion of loaded vehicles over 4 hourly intervals was as below:

Hours	% loaded
0700-0800	71
0800-0900	52
0900-1000	50
1000-1100	66
Average:	60

The utility of this table will become evident when 24 hour data is available for different stations. The above table serves the purpose of illustration only.

Table 5:

Table 5 gives distribution of goods vehicles by load carried. Maximum frequencies occur in the load group 151-200 maunds with 28 vehicles followed by 201-250 maunds with 22 vehicles and 251-300 maunds with 12 vehicles. One vehicle was in the load group of 301-350 maunds (10.7 to 12.5 tons) 14 vehicles carried less than 100 maunds.

The distribution of vehicles according to main load classes is shown below:

Maunds	No. of vehicles	%
Upto 100 .. ..	14	16
101-200 .. ..	38	44
201-300 .. ..	34	39
301 & above.. ..	1	1
Total:	87	100

Table 6:

Table 6 gives number of loaded goods vehicles and load carried by districts of origin and destination. It indicates inter-district commodity flows the main features of which are as below:

- (a) 87 loaded vehicles carried in all 16250 maunds (580 tons of commodities during the four hour Count. The average load per loaded vehicle was 186 Maunds 6.67 Tons).
- (b) 45% vehicles with 36% commodities constituted local traffic having its origin and destination in Lahore district.
- (c) The remaining 55% vehicles with 64% commodities constituted inter-district traffic.
- (d) Of the total inter-district traffic 48% vehicles with 55% commodities had their origin and destination in Lahore district.
- (e) In all 93% vehicles with 91% commodities had their origin and/destination in Lahore district.
- (f) 7% vehicles with 9% commodities had their origin and destination out-side the district of Lahore. This constituted through traffic not requiring stoppage at Lahore. This type of information is useful for the construction of by-passes.

The above ratios are shown in Tabular Form below:

	Vehicles	Percentage Commodities
1. Local Traffic. (Having O-D in Lahore distt).	45	36
2. Inter-District Traffic:	55	64
(a) With one end in Lahore Distt.	48	55
(b) Transit traffic to and from districts other than Lahore.	7	9
3. Total traffic with one end at Lahore	93	91

The main inter-district flows are shown below:

Origin	Destination	No. of Vehicle	Load (Maunds)
Karachi	Lahore	14	3423
Quetta	Lahore	8	1640
Multan	Lahore	4	850
Sahiwal	Lahore	1	300
Lahore	Sahiwal	7	1000
Bahawalnagar/Rahim Yar Khan	Lahore	3	680
Khairpur/Hyderabad	Lahore	5	1006
Multan/Bahawalnagar/Khairpur	Rawalpindi	3	750
Sheikhupura	Sahiwal	2	500
Peshawar	Karachi	1	250
	TOTAL:	48	10399
Within Lahore District.	.. ..	39	5851
	Grand Total:	87	16250

Table 6 is the most important result of the Data. Similar tabulations can be compiled for other types of vehicles and for major commodities. As a specimen, the Origin-Destination for Fruits and Vegetables has been compiled in Table 7.

Due to small size of the sample, the above data serves the purpose of illustration only. The imbalance in inter-district traffic may be due to the small size of the sample.

Table 7:

Table 7 shows the origin and destination of vehicles carrying Fruits and Vegetables for the purposes of illustration only.

Of the 14 goods vehicles, 7 originated from Quetta, 3 from Khairpur, 3 from Hyderabad and 1 from Karachi. All were destined for Lahore.

Table 8:

Table 8 illustrates the distribution of buses according to number of passengers carried by hourly interval. The number of buses falling in various passenger groups is shown below:

Passenger Group	No. of buses
Upto 10 .. .. .	7 (4%)
11-20 .. .. .	19 (10%)
21-30 .. .. .	27 (15%)
31-40 .. .. .	27 (15%)
41-50 .. .. .	48 (26%)
51-60 .. .. .	42 (23%)
61 and above .. .. .	13 (7%)
Total: .. 183 (100%)	

It is evident from the above that only 14% of buses carried less than 20 passengers. 30% of buses carried 21 to 40 passengers, 49% carried 41 to 60 passengers and 7% carried more than 61 passengers. The average seating capacity of small buses is 42 and large size buses 51. Thus more than 30% buses were over loaded.

The hourly frequency was evenly distributed. During the first hour (7 A.M. to 8. A.M.), 42 buses passed the Survey Point while from 8.A.M. to 11 A.M. 47 buses passed each hour. This means one bus after every 1.3 minutes.

The proportion of buses carrying more than 41 passengers increased from 45% in the first hour to 51%, 55% and 72% in the second, third and fourth hours respectively.

Table 9:

Table 9 shows the number of buses and number of passengers by district of origin and destination. The Origin and Destination of buses indicate their route patterns. It would be seen that out of 183 buses, 74 (40%) were operating within the district of Lahore on suburban routes. The remaining 199 (60%) buses operated on routes extending from Lahore to Sahiwal, Multan, Muzaffargarh and Bahawalnagar and from Multan to Sialkot. The number of buses by route and direction is shown below:

Route	Direction		Total
	Inward	Outward	
Lahore-Sahiwal .. .. .	3	18	21
Lahore-Multan .. .. .	55	18	73
Lahore-D.G.Khan .. .. .	5	-	5
Lahore-Muzaffargarh .. .. .	-	1	1
Lahore-Bahawalnagar .. .. .	5	3	8
Multan-Sialkot .. .. .	1	-	1
Total:	69	40	109

The imbalance in the flow of buses in two directions is due to time factor.

The origin and destination of passengers based on origin and destination of passengers based on origin and destination of buses is not meaningful, due to large turn over at intermediate stations. The origin destination of passenger traffic can be compiled from the Booking/Ticket Sale records. This would require a separate study.

Table 10:

Table 10 shows the distribution of goods vehicles according to gross and rear axle weight. This table is based on actual weighing of gross and rear axle loads of trucks at the Octroi Post Weighing Bridge. This was done to determine the extent of gross and rear axle loads and the accuracy of net load reported by drivers. These are described below :

Extent of Loading :

The number of vehicles in various load categories are shown below :

Gross Load (Maunds)	No. of Trucks	%
Upto 100	-	-
101-150 .. .. .	65	34.0
151-200 .. .. .	5	2.6
201-250 .. .. .	11	5.8
251-300 .. .. .	24	12.5
301-350 .. .. .	28	14.7
351-400 .. .. .	29	15.2
401-450 .. .. .	29	15.2
Total :..	191	100

There was no truck exceeding 450 maunds (16 tons) gross weight.

The registered unladen weight of a standard bedford truck is 12300 Lbs. (150 maunds or 5.5 tons). Taking into account the weight of body and accessories carried by Trucks, the vehicles in gross load category upto 200 maunds would be empty. Their proportion was 36.6%.

5.8% of trucks were in gross load category of 201 to 250 maunds. The number of vehicles in higher load categories from 251 to 450 maunds are more or less evenly distributed.

Relationship between Gross and Rear Axle Load:

The relationship between gross and rear axle load is technically determined by the construction of vehicle and body. The diagonal nature of the table indicates a straight line relationship which is also shown graphically.

Accuracy of Net Load Reported:

A general comparison of percentage distribution of vehicles into various net load categories as reported by Drivers with corresponding distribution of vehicles into gross load resulting from actual weighing of vehicles (after allowing for standard unladen weight) has not produced consistent results. The Chi Square test indicated that the two sets of distribution were different from each other and the Pearsons Rank Correlation was significant at 5% level. There might be some bias in the data due to the fact that vehicles covered at the two places were not the same. There was an important inter-section in between the survey site and Octroi Post. The vehicles turning in and out from this inter-section and those Originating or terminating in between the survey site and the Octroi Post were not covered at one of the two places depending upon their direction. The total number of trucks weighed were 191 while the number of trucks interviewed at the survey site were 145. A further exercise is being carried out to match the net load reported by drivers with actual weight observed at the Weighing Bridge by sorting out the vehicles covered at both the places. The results will be reported separately.

PILOT ORIGIN-DESTINATION SURVEY, LAHORE-MULTAN ROAD

Table No. 1-Number of Vehicles by District of Origin and Destination

Origin District	Total	Destination Districts													
		Rawalpindi	Lyallpur	Sialkot	Lahore	Sahiwal	Multan	DG Khan	Bahawalpur	Bahawalnagar	Larkana	Karachi	Quetta		
Peshawar	2	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Rawalpindi	2	-	-	-	1	-	-	-	-	-	-	-	-	1	-
Lyallpur	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Sialkot	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Sheikhpura	2	-	-	-	-	2	-	-	-	-	-	-	-	-	-
Lahore	376	-	3	-	240	46	66	6	2	10	1	1	1	1	-
Sahiwal	45	1	-	-	44	-	-	-	-	-	-	-	-	-	-
Multan	28	2	-	1	25	-	-	-	-	-	-	-	-	-	-
Mazaffargarh	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Bahawalpur	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bahawalnagar	7	1	-	-	6	-	-	-	-	-	-	-	-	-	-
Rahim Yar Khan	2	-	-	-	2	-	-	-	-	-	-	-	-	-	-
Khairpur	3	1	-	-	2	-	-	-	-	-	-	-	-	-	-
Hyderabad	3	-	-	-	3	-	-	-	-	-	-	-	-	-	-
Karachi	14	-	-	-	14	-	-	-	-	-	-	-	-	-	-
Quetta	8	-	-	-	8	-	-	-	-	-	-	-	-	-	-
Sibi	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Grand Total:	497	5	3	1	349	48	66	6	2	11	1	4	1	-	-



PILOT CTIC IN-DESTINATION SURVEY, LAHORE-MULTAN ROAD

Table No.2.- Number of Vehicles by Time, Type and Passengers carried

Time	Total number	Buses	Cars	S. Wagons	Jeep	Taxi	Pick-up/shaw	M/Scooter	Truck/D.Van.	Tractor/Trailer									
7.00-8.00	98	42	1585	17	65	1	2	-	2	35	118	1	2						
8.00-9.00	125	47	1817	28	62	1	17	3	3	12	19	31	116	1	6				
9.00-10.00	135	47	1919	31	89	5	26	3	12	-	11	18	33	159	-				
10.00-11.00	139	47	2085	32	100	4	21	2	5	-	1	3	6	10	41	171	6	21	
Grand Total	497	183	7406	108	315	11	66	8	29	2	8	1	3	31	49	145	564	8	29
Av. Pass/Veh.	-	-	40	-	3	-	6	-	4	-	3	-	2	-	2	-	4	-	4

PILOT ORIGIN-DESTINATION, SURVEY LAHORE-MULTAN ROAD  
 Table No.3.-Distribution of Trucks by Types of Commodity

Type of Commodity	No. of Trucks
<u>Agriculture:</u>	
01. Wheat .. .. .	1
04. Oil Seeds .. .. .	4
07. Sugarcane .. .. .	1
08. Fruits and Vegetables .. .. .	14
09. Fodder, Grass .. .. .	1
10. Other Agricultural Products. .. .. .	3
<u>Animals And Animal Products:</u>	
11. Live Stock. .. .. .	7
12. Hides and Skins. .. .. .	1
<u>Mining and Quarrying:</u>	
16. Ballast, Stone, Sand, Bajri, Crush, Bricks...	24
20. Salt. .. .. .	1
<u>Manufactured Goods:</u>	
22. Cement .. .. .	2
23. Fertilizers. .. .. .	7
29. Cigarettes. .. .. .	1
33. Iron and Steel-Angles, Axes, Sheets, Bars, Girders	6
38. General Merchandize. .. .. .	8
41. Miscellaneous. .. .. .	3
42. Electrical Goods. .. .. .	2
43. Other Manufacturing goods. .. .. .	1
99. Empty. .. .. .	58
Total: -	145

PILOT ORIGIN-DESTINATION SURVEY LAHORE-MULTAN ROAD  
Table No.4-Distribution of Trucks by Time and Load Factor

Time	Number of Trucks		
	Total	Loaded	Empty
7.00-8.00	35	25	10
8.00-9.00	31	16	15
9.00-10.00	38	19	19
10.00-11.00	41	27	14
Total:	145	87	58

PILOT ORIGIN-DESTINATION SURVEY, LAHORE-MULTAN ROAD  
Table No.5.-Distribution of Trucks by Net Load Carried

Load (Maunds)	No. of Trucks
Not known. .. .. .	-
Empty. .. .. .	58
Upto 50. .. .. .	10
51-100 .. .. .	4
101-50 .. .. .	10
151-200 .. .. .	28
201-250 .. .. .	22
251-300 .. .. .	12
301-350 .. .. .	1
351-400 .. .. .	-
401 and above .. .. .	-
Total:	145

PILOT ORIGIN-DESTINATION SURVEY, LAHORE-MULTAN ROAD

Table No.6-Number of Loaded Trucks and net load (MDS)  
Carried by Districts of Origin & Destination.

Origin District	Destination Districts									
	Total		Rawalpindi		Lahore		Sahiwal		Karachi	
	No.	Load	No.	Load	No.	Load	No.	Load	No.	Load
	(Mds)	(Mds)	(Mds)	(Mds)	(Mds)	(Mds)	(Mds)	(Mds)	(Mds)	(Mds)
Peshawar.	1	250	-	-	-	-	-	-	1	250
Sheikhupura	2	500	-	-	-	-	2	500	-	-
Lahore.	46	6851	-	-	39	5851	7	1000	-	-
Sahiwal.	1	300	-	-	1	300	-	-	-	-
Multan.	5	1150	1	300	4	850	-	-	-	-
Bahawalnagar.	2	525	1	275	1	250	-	-	-	-
Rahim Yar Khan	2	430	-	-	2	430	-	-	-	-
Khairpur.	3	625	1	175	2	450	-	-	-	-
Hyderabad.	3	556	-	-	3	556	-	-	-	-
Karachi.	14	3423	-	-	14	3423	-	-	-	-
Quetta.	8	1640	-	-	8	1640	-	-	-	-
<b>TOTAL:</b>	<b>87</b>	<b>16250</b>	<b>3</b>	<b>750</b>	<b>74</b>	<b>13750</b>	<b>9</b>	<b>1500</b>	<b>1</b>	<b>250</b>

PILOT ORIGIN-DESTINATION SURVEY LAHORE-MULTAN ROAD  
 Table No.7.-Number of Trucks by District of Origin and  
 Destination Carrying Fruits and Vegetables.

Origin District	Destination District		
	Total	-	Lahore
Khairpur .. .. .	3	-	3
Hyderabad. .. .. .	3	-	3
Karachi .. .. .	1	-	1
Quetta. .. .. .	7	-	7
Total ....	14	-	14

PILOT ORIGIN-DESTINATION SURVEY, LAHORE-MULTAN ROAD  
 Table No.8.-Distribution of Buses by Time and Average Number  
 of Passengers carried

Time	Total	Passenger Groups						
		Upto 10	11-20	21-30	31-40	41-50	51-60	61 and above
7.00 to 8.00	42	4	6	10	3	6	9	4
8.00 to 9.00	47	-	7	8	8	13	8	3
9.00 to 10.00	47	1	4	6	10	13	10	3
10.00 to 11.00	47	2	2	3	6	6	15	3
Total	183	7	19	27	27	48	42	13

PILOT ORIGIN-DISTINATION SURVEY, LAHORE-MULTAN ROAD

Table No.5.-Number of buses and passengers carried by districts of origin and destination.

Origin District	Destination Districts													
	Total	Sialkot	Lahore	Sahiwal	Multan	D.G. Khan	Behawal- Nagar	Pass- enger	Pass- enger	Pass- enger	Pass- enger			
Lahore	142	5276	-	74	2661	3	96	55	2221	5	183	5	115	
Sahiwal.	18	930	-	18	930	-	-	-	-	-	-	-	-	
Multan.	19	997	1	54	18	943	-	-	-	-	-	-	-	
Muzaffargarh.	1	52	-	-	1	52	-	-	-	-	-	-	-	
Behawalnagar.	3	151	-	-	3	151	-	-	-	-	-	-	-	
Total:	133	7406	1	54	114	4737	3	96	55	2221	5	183	5	115

PILOT ORIGIN-DESTINATION SURVEY, LAHORE-MULTAN ROAD

Table No.10.- Distribution of Trucks by Gross Load

Gross Load (Mds).	Rear Axle Load (Mds).									
	Total	Upto 50	51-100	101-150	151-200	201-250	251-300	301-350	351-400	400 & above
Upto 100 .....	-	-	-	-	-	-	-	-	-	-
101-151 .....	65	1	64	-	-	-	-	-	-	-
151-200 .....	5	-	5	-	-	-	-	-	-	-
201-250 .....	11	-	-	3	8	-	-	-	-	-
251-300 .....	24	-	-	-	18	5	1	-	-	-
301-350 .....	28	-	-	2	-	23	3	-	-	-
351-400 .....	29	-	-	-	-	3	23	3	-	-
401-450 .....	29	-	-	-	-	-	6	20	3	-
451 and over	-	-	-	-	-	-	-	-	-	-
<b>Total:</b>	<b>191</b>	<b>1</b>	<b>69</b>	<b>5</b>	<b>26</b>	<b>31</b>	<b>33</b>	<b>23</b>	<b>3</b>	<b>-</b>



INSTRUCTIONS FOR THE USE OF ROAD TRAFFIC ORIGIN-  
DESTINATION SURVEY QUESTIONNAIRES

The Questionnaires consist of a small booklet containing 100 pages. The first page of each booklet is of different colour and contains general information concerning the Survey Station such as location, date, time etc. The remaining 99 pages of the booklet are Vehicle Interview Forms for recording particulars of individual vehicles. Separate form would be used for each vehicle. Instruction for the use of Questionnaires are given below:-

Covering Page:

General:

1. All Questionnaire Books are numbered for counted purposes and will be accounted for.
2. The receipt use and movement of Questionnaire will be recorded by a Data Control Section at a Central Place. These records will stand away other things. The numbers of books based at various Survey Stations on different dates. This is essential for data processing.
3. Instructions for filling the forms should be followed strictly. All questions should be asked recorded in the manner specified in the instructions.
4. The Supervisor Incharge will be responsible for receipt, custody and transmission of Questionnaire Books for the Survey Station.
5. The Questionnaire Books should be issued to Enumerators first before starting the survey and should be collected back immediately after use.
6. All entries should be made clearly and legibly with ball-points only supplied for the purpose. Pencils or ink pens should not be used.
7. The questions for which boxes have been provided, only one digit should be written in one box. In case of an error, the number should be crossed and re-written above the appropriate box. Over writing of numbers should not be done.
8. The space provided for code numbers has been shaded. Nothing should be written by Enumerators in the shaded area. Code words will be filled in the office.

9. Before issuing the Books to Enumerators, items 1 to 7 of covering page should be filled in by the Supervisor in the following manner:-

(i) Location:

- (a) Name of Road.- The name of road should be written with reference to significant towns/cities connected by the roads. For example do not write as G.T. Road, National Highway etc., but write as Lahore-Multan, Karachi-Hyderabad road.
- (b) Road Section.-If there are important inter-sections on the road indicated at (a) above, then indicate the section on which Survey Station is located. Example: Lahore-Multan Road, Khanewal-Multan Section etc.
- (c) Exact Location of Survey Station.-Give Mile No. and name of town to which mileage stands.

(ii) Survey Station Number.- Each Survey Station number will be given a code number which will be intimated to Enumerators before hand. In case the Survey Station is located at a place where a regular Traffic Count Station exists, the number of these stations will be used. For other places, appropriate numbers will be allotted by the Controlling Office.

(iii) Date of enumeration.- For date of enumeration, six boxes have been provided two each for day, month and year. The date will be written as below:-

2	1	0	6	7	6	0	6	0	8	7	6	2	8	1	2	7	6
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

(iv) Day of the week.-The day of the week Monday through Sunday should be written. The day will be coded later in the Office.

(v) Commencing hour.-Commencing hour will be written on covering page on first Vehicle Interview Form of each book and at change of hour. One hour interval will be maintained and 24 hour clock will be used in four digits-2 for hours and two for minutes. The hour starting midnight will be written as 2400 and the next hour as 0100. Preferably the interview should start at close hour only. If the survey starts at some minutes past an hour, the exact time may be written on the first page and again at close of that hour. For example, if survey starts at 0730 hours, this time should be written on the first form but at 0800 hours time should again be recorded on the form in hand. In such a case the survey should end at 0730 hours next day, and on that day from commencing hour will be written 0700.

" 28 "

Then time should be recorded at change of hour irrespective of the time of interview. Example at 0800 hours note the time on the in hand and fill in the particulars of the vehicle at what a time it arrives during that hour.

In case there is no vehicle during an hour, cross the form on which time was written at the coming hour, and write next hour on the next form.

- (v) Name of Enumerator/Name of Supervisor.- These should be written clearly and legible. Initials and signatures are not required here.
- (vii) Number of forms filled in the book.- This information will be written by Enumerators on completion of Book and close of survey and will be checked by Supervisors. In the case of completed books write 01 to 99, in the case of incomplete books at the close of survey write the first and last number of form used e.g. 01 to 57 etc. The last two digits on the vehicle indicate the number of the form whereas first form digits indicate Book Volumes.
- (viii) Number of next book.-After the completion of one book each Enumerator should write the number of next book taken by him whether during an hour or at the completion of an hour. On the first page of the next book all entries of the covering page of the previous should also be repeated.

Items 1 to 4 on the covering pages of books likely to be used at a station should preferably filled before hand so that books of one station do not mix up with others.

#### Vehicle Interview Forms:

The vehicle interview form contain entries applicable to individual only. Various items in this form should be filled in as explained below:-

1. Time.- Time should be written in four digits on:(a) Covering page of the Book(b) First Vehicle Interview Form of each Book; and (c) at change of hour as explained earlier. Time need not be written on forms filled in during hourly interval. This will be recorded by computer programme subsequently.

2. Type of Vehicle.-Vehicles have been classified into six categories which are self coded. The number below each category should be circled. The Enumerators should be able to circle the appropriate number as the vehicle approaches. All vehicles not covered under 1 to 5 will be marked under the category of other vehicles.
3. Form Number.-The Form numbers are pre-printed. First four digits indicate book number and the last two digits indicate page number. The covering page is numbered 00 whereas the remaining vehicle interview forms are numbered 01 to 99. Nothing is to be done in this column.
4. Registration Code.-This is for office use. Enumerators should not write any thing here.
5. Registration Number.-Seven digits have been provided for registration number. First three will contain alphabets and the next four would contain numericals. One digit should be written in each box.
6. Number of Passengers.-The number of passengers will be written for all categories of vehicle. For buses, trucks station wagons and other commercial vehicles, drivers and conductors will be excluded. For cars, motor-cycles etc., included drivers, will be included in the number of passengers. For small vehicle and trucks it would be possible to count the numbers of passengers on sight. For buses, shortcut methods and such as seating capacity plus over loading or minus vacant seats could be used. Number should not be written by guess. Conductors of buses on inter-city route would also be able to fill the number of passengers. For suburban routes number would have to be counted.



7. Origin-Destination.-Item(7) to (10) relate to origin and destination. Only the names of District will be written unless **otherwise** specified. To fill up these items question should be asked in the following manner:

- (a) Where did you start the journey?
- (b) The respondent will give the name of place. If that place is not a District Headquarter ask the district of that place and write the same.
- (b) Did you stop on the way before reaching this place? If yes, ask what was the purpose? If the purpose is related to business or work, the name of place(Distt) may be written. If the purpose is rest meal, service etc. i.e more this question and cross the space, provided in the form.
- (c) Where the journey will end? Write the name of the district.
- (d) Would you stop on the way? If yes, ask the purpose? If the purpose is related to business or work, write the name of district, otherwise cross the space.

For goods vehicles, the words "Place, Journey started, Ends, Last and Next business Stop "etc., would be replaced by the 'Place' goods load unloaded and the question should be asked as below:

- (a) Where the goods were loaded?
- (b) Did you load or unload any goods on the way?
- (c) When the goods would be finally unloaded?
- (d) Would you load or unload any goods on the way?

In the case also, only the names of districts will be written. Space provided for Code Numbers is for office use and nothing should be written in the standard area by Enumerators.

(II) Type of Commodities:

The last line of the form is intended for goods vehicles only. Ask the driver what commodity/commodities carried and write the same as indicated by him. If more than one commodities are loaded write the first major commodity. The commodity code list should be consulted by Enumerators for ease of identification.

Net load:

Ask the driver the load of commodities carried in the vehicle and write the same in maunds. Do not question the statement of the driver.

All boxes provided for Code Numbers should be left blank. Nothing should be written by Enumerators in the standard area.

Annexure-IIICOMMODITY CLASSIFICATION FOR TABULATION OF  
ROAD TRAFFIC ORIGIN-DESTINATION DATAAgriculture:

- 01 Wheat
- 02 Rice
- 03 Other Grains & Pulses
- 04 Oil Seeds
- 05 Cotton Raw and pressed
- 06 Tobacco
- 07 Sugarcane
- 08 Fruits & Vegetables
- 09 Fodder, Grass
- 10 Other Agricultural Products

Animals & Animal Products:

- 21 Live stock
- 22 Hides & Skins
- 23 Wool.
- 29 Other Animal Products

Mining & Quarrying:

- 31 Ballast, Stone, Sand, Bajri, Crush, Bricks
- 32 Coal, Coke
- 33 Lime Stone
- 34 Gypsum
- 35 Salt
- 36 Ores, common
- 39 Other Mining and Quarrying

Manufactured Goods:Bulk Commodities:

- 41 Cement
- 42 Fertilizers
- 43 Sugar
- 44 Jagree, Gur, Shakkar



- 45 Molasses
- 46 Vegetable Oils, Vegetable ghee
- 47 Iron & Steel Girders
- 48 Machinery

Light Manufactures:

- 51 Textiles-Cotton, Woollen, Silk Cloth, Yarn & Piece goods
- 52 Jute Manufactures
- 53 Furniture, Fixtures & Household effects
- 54 Beverages
- 55 Cigarettes
- 56 General Merchandize

POL Products:

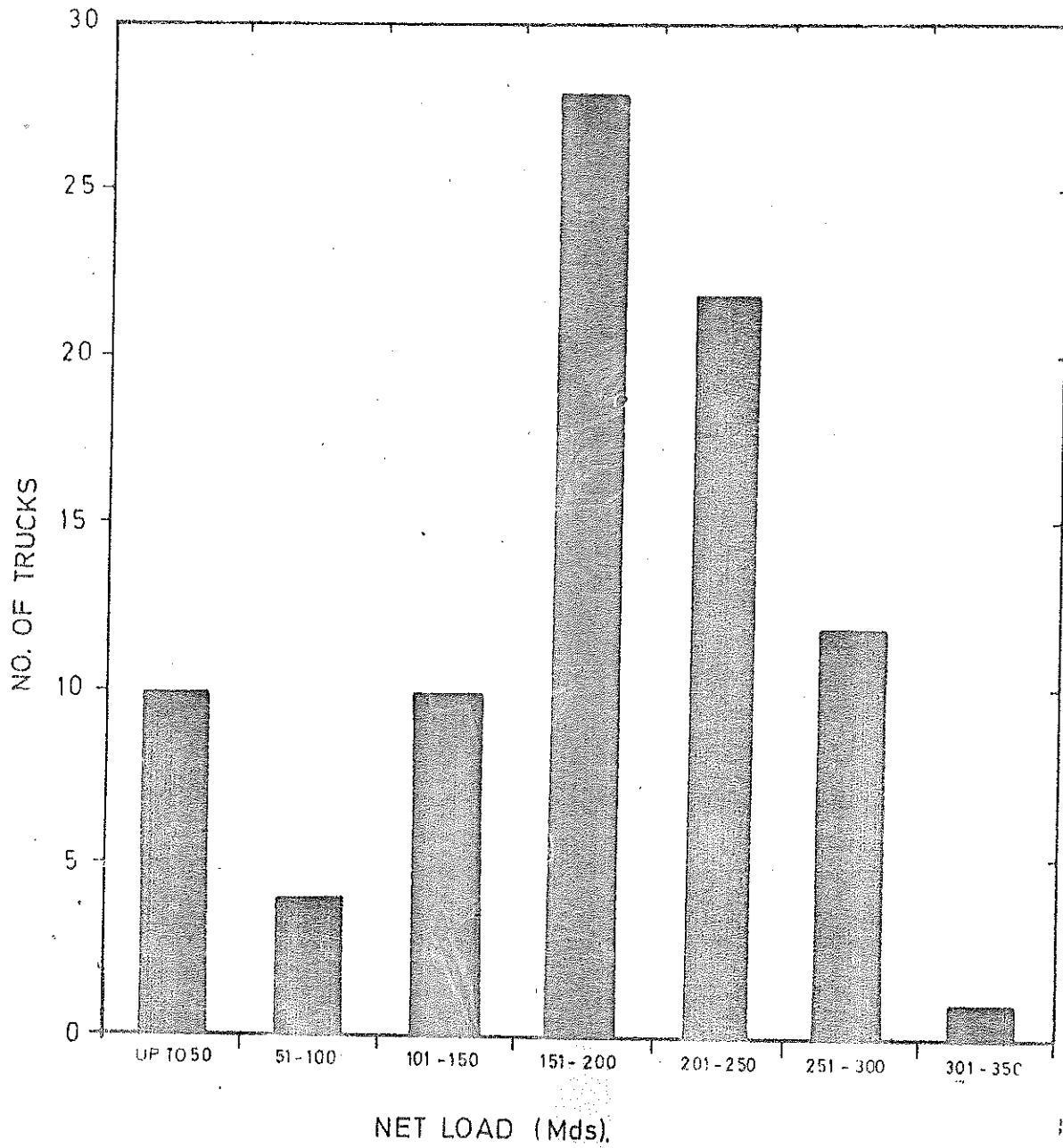
- 61 POL Products, Petrol, Diesel, Kerosene Oil, Furnace Oil.
- 62 Bitumen
- 69 Miscellaneous
- 99 Empty

DISTRICT CODES FOR ROAD TRAFFIC O-D SURVEY

CODE:

- 100 NWFP
- 110 Peshawar Division
- 111 Hazara District
- 112 Mardan District
- 113 Peshawar District (Incl. Tribal Areas under D.C. and Khyber Agency).
- 114 Kohat District (Incl. Tribal Areas under D.C. and Khurram Agency).
- 120 D. I. Khan Division
- 121 D.I.Khan District (Incl. Tribal Areas under D.C. and South Waziristan).
- 122 Bannu District (Incl. Tribal Areas under D.C. and North Waziristan).
- 130 Malakand Division:
- 131 Dir District.
- 132 Chitral
- 133 Swat District.
- 134 Malakand Agency (Incl. Bajaur & Swat Ranizai and Sam Ranizai).
- 200 PUNJAB:
- 210 Rawalpindi Division:
- 211 Campbellpur District.
- 212 Rawalpindi District.
- 213 Jhelum District.
- 214 Gujrat District.
- 220 Sargodha Division:
- 221 Sargodha District.
- 222 Mianwali District.
- 223 Lyallpur District.
- 224 Jhang District.

## DISTRIBUTION OF TRUCKS ACCORDING TO NET LOAD CARRIED.



- 230 Lahore Division :
- 231 Lahore District.
- 232 Gujranwala District.
- 233 Sheikhpura District.
- 234 Sialkot District.
- 240 Multan Division :
- 241 D.G. Khan District.
- 242 Muzaffargarh District.
- 243 Multan District.
- 244 Sahiwal District.
- 250 Bhawalpur Division :
- 251 Bahawalpur District.
- 252 Bahawalnagar District.
- 253 Rahimyar Khan District.
- 300 SIND :
- 310 Sukkur Division :
- 311 Jacobabad District.
- 312 Sukkur District.
- 313 Larkana District.
- 314 Nawabshah District.
- 315 Khairpur District.
- 320 Hyderabad Division :
- 321 Hyderabad District.
- 322 Dadu District.
- 323 Tharparkar District.
- 324 Sanghar District.
- 325 Thatta District.
- 330 Karachi Division :
- 331 Karachi District.
- 400 BALUCHISTAN :
- 410 Quetta Division :
- 411 Quetta District.
- 412 Sibi District.

- 413 Loralai District.
- 414 Zhob District.
- 415 Chagai District.
- 420 Kalat Division:
- 422 Kalat District.
- 421 Kachhi District.
- 423 Kharan District.
- 424 Mekran District.
- 425 Lasbela District.

FEDERALLY ADMINISTERED TRIBAL AREAS

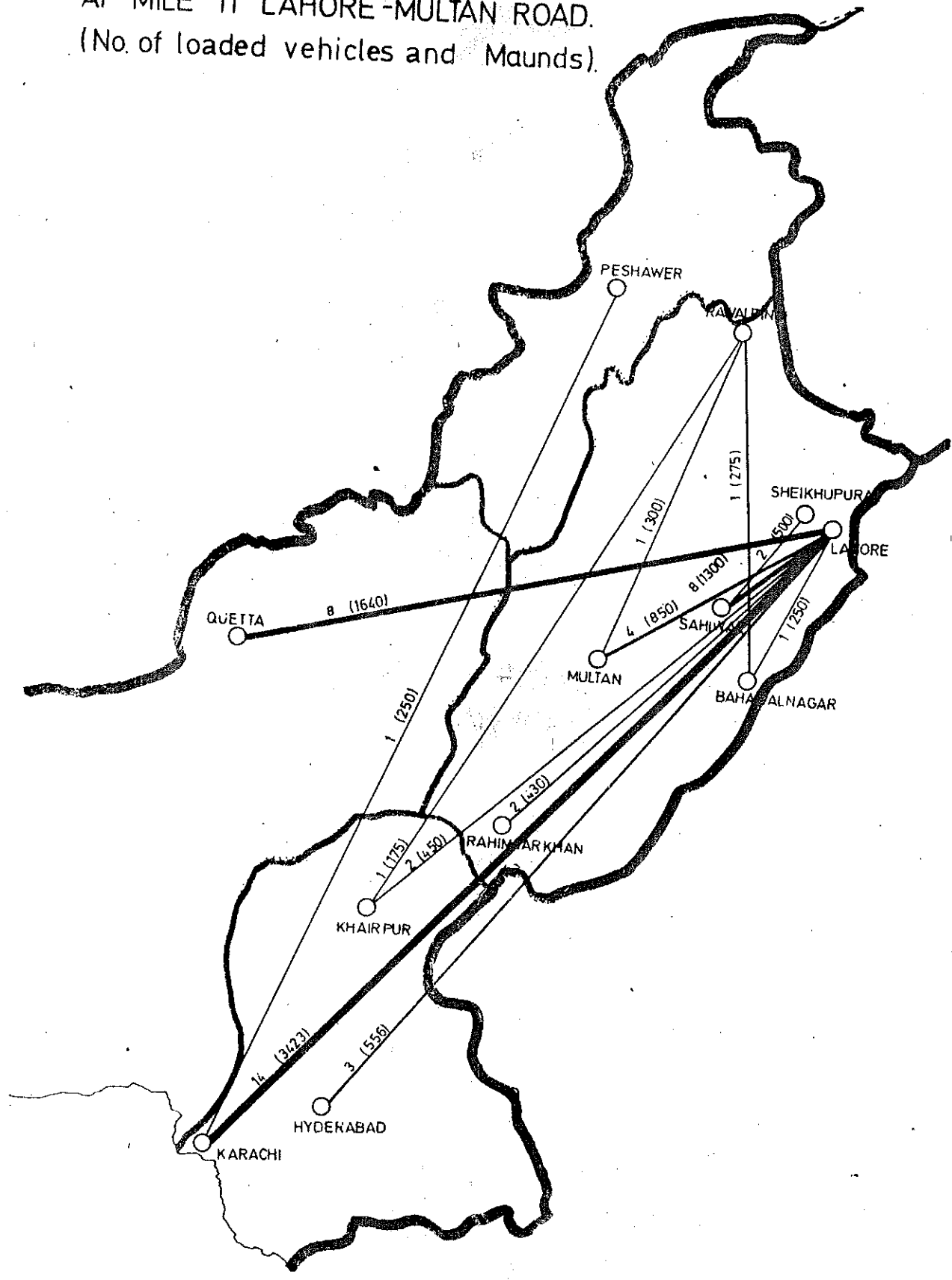
Areas under Deputy Commissioner:

- 113 Tribal Areas under D.C. Peshawar.
- 114 Tribal Areas under D.C. Kohat
- 121 Tribal Areas under D.C. D.I.Khan.
- 122 Tribal Areas under D.C. Bannu

Agencies:

- 134 Bajaur (Malakand Agency).
- 134 Mohamand Agency.
- 113 Khyber Agency
- 114 Khurram Agency
- 122 North Waziristan.
- 121 South Waziristan

# INTER DISTRICT COMMODITY FLOWS AT MILE 11 LAHORE-MULTAN ROAD. (No. of loaded vehicles and Maunds)



FOR MECHANIZED VEHICLES ONLY

HIGHWAY TRAFFIC  
ORIGIN—DESTINATION SURVEY

Annexure V  
VEHICLE CLASSIFICATION

Name of the ENM..... Location..... Road Section.....

Traffic Count Stn. No.  6 7 12 13 16 17

Date  Day Month Year

Commencing Hr.  24 HR. CLOCK

Direction  UP DOWN

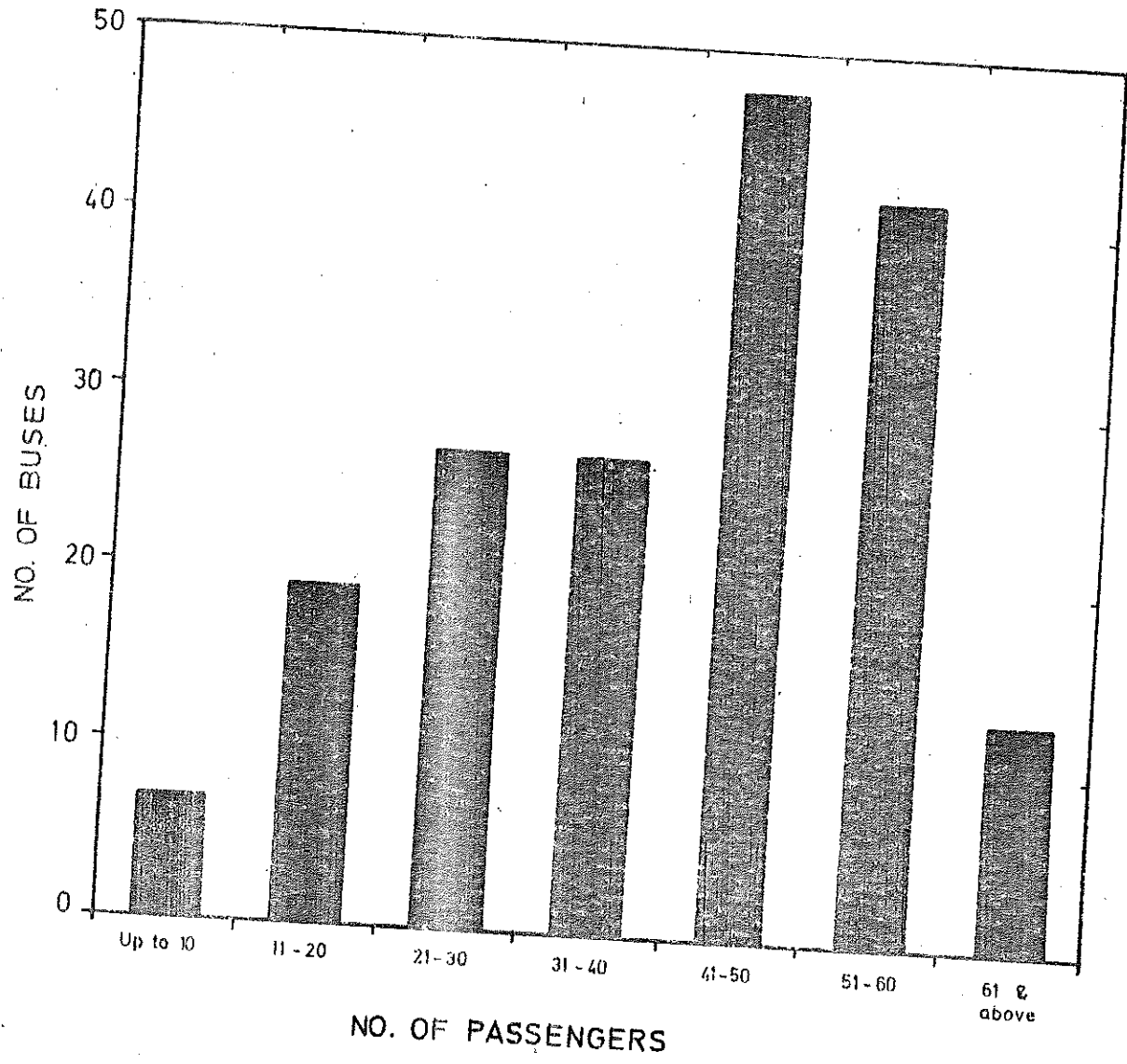
Code Vehicle

01 M/C/Scooter  
02 Motor Cars  
03 Jeep/Pick-Ups (Pass. Veh.)  
04 Station Wagons (Mini Buses)  
05 Tractor/Trailers  
06 Buses.

Code Vehicles  
07 Taxi (M. Cars)  
08 Rickshaws  
09 Pick-up (Goods)  
10 Trucks  
11 Truck Trailers  
12 Tankers  
13 Other Motor Vehicles.

Code 18-20	Registra- tion Number 21-28	Type of Veh Code 29-30	No of Pass. incl Driver		Origin			Destination		Code 37-38	Type of Journey 39	For Goods Vehicles Only		Type Commo- dities Carried
			M 31-32	F 33-34	Code 35-36	Place Journey Started	Last Busi- ness Stop	Next Busi- ness Stop	Place Journey Ends			Horse Power	Net Load Carried 45-49 (Maunds)	
01														
02														
03														
04														
05														
06														
07														
08														
09														
10														
11														
12														
13														
14														
15														

DISTRIBUTION OF BUSES ACCORDING TO  
NUMBER OF PASSENGERS CARRIED.

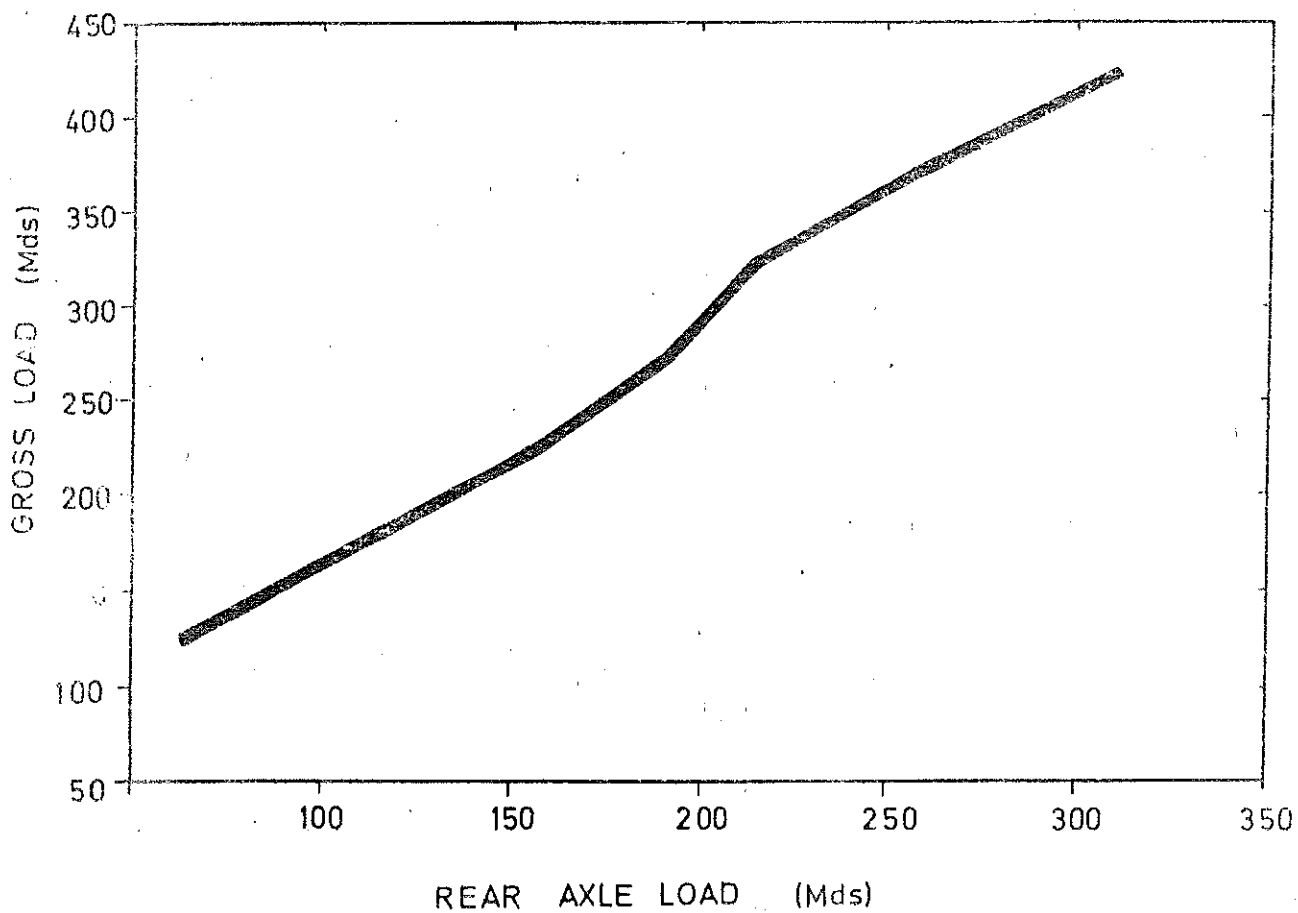








# RELATIONSHIP BETWEEN GROSS AND REAR AXLE LOAD OF GOODS VEHICLES.



ROAD TRAFFIC ORIGIN DESTINATION QUESTIONNAIRES

**ROAD TRAFFIC O-D SURVEY**

**LOCATION** BOOK NO. XXXX

NAME OF ROAD. \_\_\_\_\_

ROAD SECTION. \_\_\_\_\_

EXACT LOCATION OF SURVEY STATION \_\_\_\_\_

SURVEY STATION NO. → 

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

DATE OF ENUMERATION. → 

DAY	MONTH	YEAR
-----	-------	------

DAY OF WEEK. → 

--	--

COMMENCING HOUR 24 HOUR CLOCK. → 

--

NAME OF ENUMERATOR. \_\_\_\_\_

NAME OF SUPERVISOR. \_\_\_\_\_

NO OF FORMS FILED IN THIS BOOK. \_\_\_\_\_

NO OF NEXT BOOK STARTED. \_\_\_\_\_

← First page of Booklet

Subsequent 99 pages of Booklet →

**VEHICLE INTERVIEW FORM**

COMMENCING HOUR (24 hr clock) TYPE OF VEHICLE (Circle relevant number)

FORM NO. 

Bus	Truck	Trailer	Car, Taxi	Jeep	Van	Motor Cycle	Other
1	2	3	4	5	6	7	8

REG. CODE REGISTRATION NO. NO. OF PASS.

PLACE JOURNEY STARTED. CODE

LAST STOP FOR BUSINESS/WORK. CODE

PLACE JOURNEY ENDS. CODE

NEXT STOP FOR BUSINESS/WORK. CODE

FOR GOODS VEHICLES ONLY. TYPE OF COMMODITIES. CODE

NET LOAD CODE

lbs. Cft. No.