Government of Pakistan
Ministry of Communications
National Highway Board

INCEPTION REPORT

Technical and Economic Feasibility Study

for

Improvement of Existing Indus Highway (N-55)

between

Kotri and Peshawar

NTRC-103

15 Jan. 1988

National Transport Research Centre
Planning Commission
Islamabad

C O N T E N T S

T A B L E S

ANNEXURES

Technical and Economic Feasibility Study for Improvement of Existing Indus Highway (N-55) between Kotri and Peshawar

1. INTRODUCTION

1.1 The National Transport Research Centre have been appointed as Consultant for Technical and Economic Feasibility Study for the improvement of Existing Indus Highway (N-55) between Kotri and Peshawar. The agreement for the study was signed on 10th December, 1987.

1.2 Article 10.A.6 of the Agreement provided, among other things, submission of Inception Report "summarising the situation concerning the scope of work and detailed programme for undertaking the study". This report provides the same. In addition, the report gives details of inception and work done so far.

1.3 Section 2 gives a review of scope of work and methodology as indicated above. This is followed by details of inception in Section 3 and review of Section Consultants reports in Section 4. Finally Section 5 lists the specifications required.

2. REVIEW OF SCOPE OF WORK AND METHODOLOGY

2.1 The scope of work and methodology contained in Annexure A and B to the Agreement are affirmed and would be adhered to with added improvement in inter-action between improvements and traffic as explained below.

2.2 The scope of work at Annexure B to the Agreement, among other things, provided, on the one hand, estimation of:

(a) Existing traffic
(b) Diverted traffic and
(c) Generated traffic

and, on the other hand, to carry the projected traffic, consideration of alternatives including:

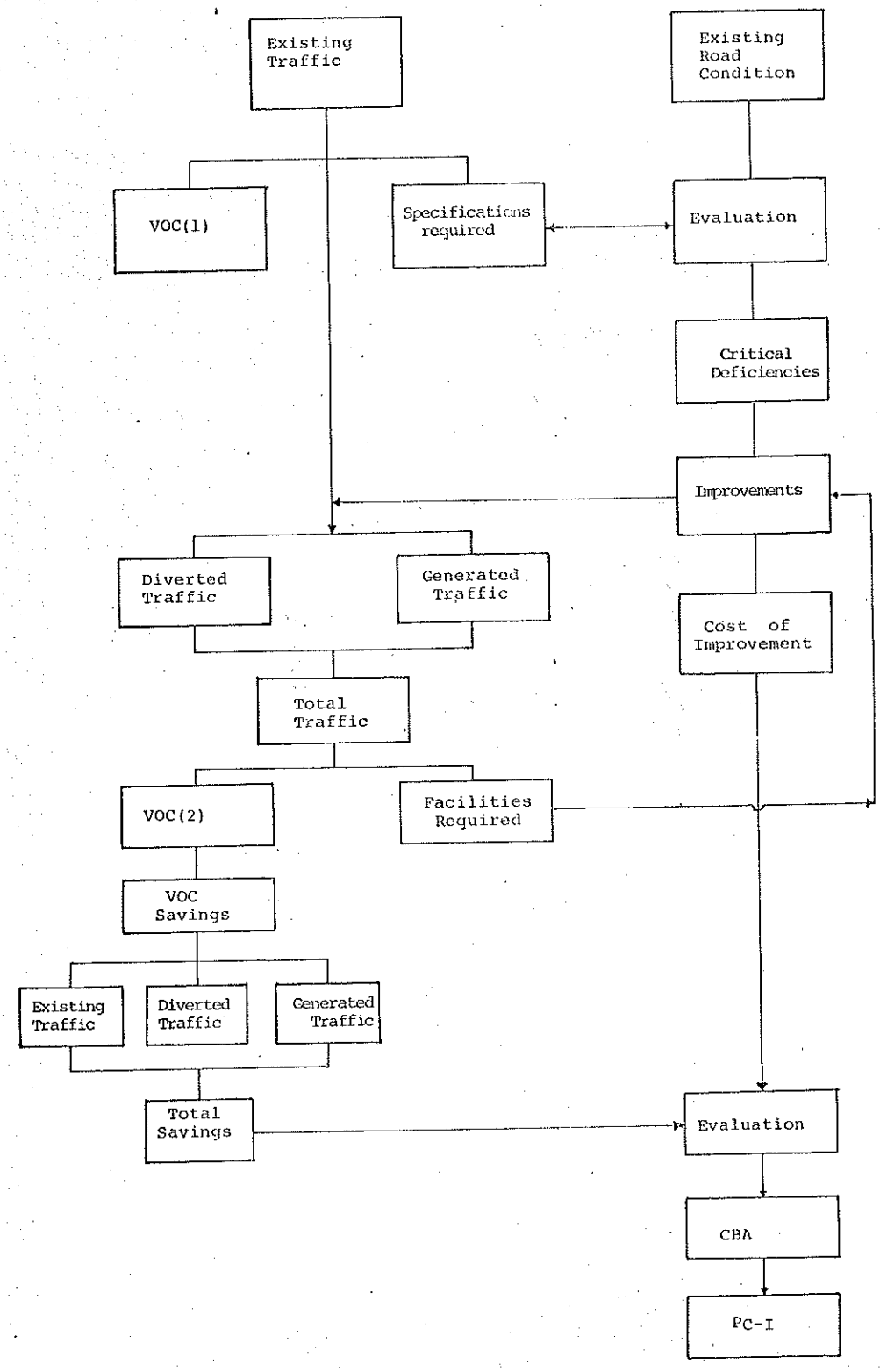
(a) do nothing
(b) Improvement of existing road
(c) Reconstruction of existing roads
(d) Realignment

2.3 It may be added for clarity that volume of diverted and generated traffic would depend upon the type of improvement. The new traffic in its turn may necessitate further improvements which will again have then affect on traffic and so on. Thus an optimum point would be arrived at where improvement and traffic balance in terms of marginal costs and benefits.

Inter-action between Improvement and Traffic

2.4 The inter-action between accompanying figure. The details are explained below.

Figure 1. Indus Highway Feasibility Study Methodology



Step 1. In the first instance, existing traffic will be estimated and facilities required to carry the same particularly width of pavement - single lane, two lane etc. would be determined on the basis of standards provided in the National Transport Plan Study.

Step 2. Review the existing facilities, compare than with facilities required determined in step 1 above, and determine critical deficiencies.

Step 3. Remove critical deficiencies (first improvement alternatives) and estimate generated and diverted traffic.

Step 4. Evaluate if improvements made are sufficient for the new traffic as well. If not, go to step 1; otherwise continue.

Step 5. Estimate cost of improvement and savings in vehicle operating costs. If savings exceed cost, accept the improvement.

2.5 The above procedure would be used for evaluating all alternatives including improvement of existing road, reconstruction, realignment etc.

Dividing the Project into Homogenous Section

2.6 The division of the project into homogenous sections will be reconsidered in the light of traffic data as soon as it is analysed.

2.7 The rest of the scope and method indicated in the Agreement will be adhered to.

3. MOBILIZATION

3.1 The work on the study was started immediately after signing of the Agreement on 10th of December, 1987. A reconnaissance survey of the project has been carried out by senior staff a separate section called "Indus Highway Feasibility Section" has been set up in the Centre, staff for survey and data processing have also been inducted and are being provided necessary training and instructions. Questionnaires for field surveys have been designed and are being sent for vetting by computer experts at the Quaid-i-Azam University. Reports of section consultants have been obtained from the National Highways Board and have been briefly reviewed. The details of work are explained in the following paragraphs.

Reconnaissance Survey

3.2 To obtain first hand knowledge and to make visual observations of the project area, existing road and traffic conditions and to meet the relevant highway department officials, a reconnaissance survey of the project road has been carried out by Chief NTRC and Deputy Chief NTRC accompanied by Economic Investigator. They travelled from Peshawar to Kotri from 23rd to 31st December 1987. The Economic Investigator also travelled back from Kotri to

Peshawar from 23rd December, 1987 to 4th January, 1988. Their travel schedule is attached at Annexure A. The general condition of the road, traffic and area was observed and discussions were held with officers of Provincial Highway Departments.

Office and Staff

3.3 A separate section named "Indus Highway Feasibility Section" has been set up in the National Transport Research Centre and necessary survey and office staff have been inducted.

3.4 Section consists of a Field Survey Unit and Data Control Unit to be headed by a Research Officer. The field survey staff is being given necessary instructions and training for conducting the survey. Similarly, procedures are being set for data control so that processing of data starts as soon as forms from first survey site are received and results become available within a minimum time lag.

Design and Printing of Forms

3.5 The survey questionnaires have been designed and are under reference to Quaid-i-Azam University Computer Centre for vetting. A specimen of O-D Survey Form is given at Annexure B.

3.6 Similarly, forms for travel time and travel speed are being finalised. These will be cyclostyled.

Data Processing

3.7 Arrangements have been made with Quaid-i-Azam University Computer Centre for processing of data. The survey forms are being cleared with them.

4. REVIEW OF REPORTS

4.1 The following reports of section consultants have been received from the National Highway Board with the exceptions noted against each.

S.No.	Name of Report	Nos Received	Details of Missing Reports
1	2	3	4
1.	Reconnaissance Report	21	Ayub Abidi (Badin Pakko Sec) Sh. Riaz Ahmed (Kalana-Shahbaz)
2.	Topographic Survey	21	Associated Consultants (Bangaldero-Shikarpur) Techno Consultant (Shore Bridge-Kotla Hasan)
3.	Soil Survey Report	22	Republic Engineer (Jampur-Taunsa)
4.	Traffic Survey Report	22	Zafar Associates (Kotri-Sann)
5.	Axle Load Survey	2	

Reconnaissance Report

4.2 The reconnaissance reports listed above have been reviewed and the following deficiencies observed:

i) The form and content of the reports differe from consultant to consultant. This makes comparison of information difficult.

ii) The form used for inventory of road conditions is also not uniform. As such itemsfor which information has been provided and the type of information provided differ from case to case. For example, none of the reports provides information on four main items of road inventory i.e. formation width, pavement width, shoulder width and embankment height.One of the consultants (Zafar Associates) has not provided measurements for any of these four items. Other consultants have provided measurements for a combination of items as shown below.

Combination of Items	No. of Consultants
Pavement, Embankment and Shoulders	5
Pavement and Embankment	9
Pavement and Shoulders	1
Formation, pavement and shoulders	1
Formation, pavement & Embankment	1
Embankment only	2
Pavement only	1
None of the items	1
	21
Reports not received	2
Total:	23

Further details of information given in reports of individual consultants are given in table 1.

iii) All the reports give raw data without any tabulation or classification. The reports mention measurements at various points but give no indication of length against various measurements. For example, the width of pavement is given for each kilometer but there is no indication as to how much length is 6 meter wide or so.

iv) Length of road sections assigned to various consultants is overlapping and there is need for adjustment. The total length assigned to various consultants adds up to 1285 Km as against actual length of 1247 Km.

4.3 In view of the above there is need to specify a form and obtain information for all the consultants on uniform basis. Such a form would be prepared and sent to the National Highways Board shortly.

4.4 On the basis of available information, the length of road has been classified according to width of pavement. Details are given in table 2.

4.5 It would be seen from the above referred table that of the 1019 kilometer length for which reports are available, 50 kilometer are less than 12 ft (3.5 meter) wide, 397 kilometer are 12 to 18 ft (3.6-5.5 meter) wide, 548 kilometer are 18 to 26 ft (5.51-8.0 meter) wide and 24 kilometer are more than 26 ft(8 meter) wide. The last category includes small stretches of a few kilometer here and there. The portions for which reports are not available include Kotri-Sann, Baladin-Pakko and Kalana Road-Latamber.

Traffic Survey Report

4.6 The traffic survey reports of the Consultants have also been reviewed and a number of deficiencies/discrepancies observed e.g.

i) The classification of vehicles used by various consultants is not uniform.

ii) Some Consultants have combined buses and wagons others have combined wagons cars.

iii) The selection of survey dates has not been made properly. For example, Pak Consolidated Consultants and Abbasi Associates Ltd have taken two counts on one day of the week i.e. Friday only. The counts should have been repeated on different days of the week.

iv) Non-motorised traffic has been covered by some consultants and ignored by others.

v) There are large variations on adjoining section for which there is no possible explanation.

4.7 On the basis of available data, the traffic volume for different points has been compiled. The summary of results is shown in table 3.

Axle Load Survey

4.8 The axle load survey report was reviewed alongwith Project Coordinator, National Highways Board and a representative of M/s Associated Consulting Engineers on 21-12-1987 and the following deficiencies were noted.

1. It was observed that the field data was not edited for elimination of doubtful reading with the result that the final EAL factors became doubtful.

2. The Axle Load Survey was carried out in isolation of the traffic counts as such the correct distribution of various Axle Categories could not be established. It was, therefore, decided that traffic count data should be obtained from two or three sectional consultants and a representative distribution established.

3. Data should be analysed to separate empty and loaded trucks and their percentage distribution established.

4. It appeared from the data that light pickups and suzukis were also included in the truck counts. These should be identified and separated. Some of the readings showed Axle wts in excess of 20 tons. It could not be conceived as to how these trucks were weighed with the equipment which had a maximum capacity of 20 tons (under two wheels). This may be explained.

5. Equivalent Axle load for tandem Axles (34000 lbs) was used for 3 Axles also which is wrong. This should be corrected from tables given in ASSHTO Design Guide of 1986.

6. A very large number of empty trucks were recorded which was un-necessary. Empty and loaded trucks should be analysed separately.

The above discrepancies were conveyed by the National Highways Board to the Consultant on 22.12.1987. The revised tabulations of axle load survey results are awaited.

Table 1

INFORMATION CONTAINED IN RECONNAISSANCE REPORT OF CONSULTANTS

S.No.	Consultant	Section	Length Km	Information Provided				Remarks
				Formation	Pavement	Shoulders	Embankment	
1.	Zafar Associates	Kotri - Sann	87					Details not specified.
2.	NESPAK	Sann - Bhan Sayedabad	86		x		x	
3.	Pak. Consolidated	Bhan Sayedabad	47		x		x	
4.	Abbasi Associates	Kakar - Baladin	39		x		x	
5.	Ayub Abidi	Baladin - Pakko	36					Reconnaissance Report not available.
6.	Loya Associates	Pakko - Bangledero	50		x	x	x	Measurement in feet. Form more detailed the other.
7.	Associated Consultancy	Bangledero - Shikarpur	50		x	x		Different traffic of form used.
8.	ABM Engineers	Shikarpur - Ghouspur	52		x		x	
9.	Zaheeruddin Consultants	Ghouspur - Badani	34		x		x	
10.	Noon Qayoom	Badani - Shor Bridge	42		x		x	
11.	Techno Consultant	Shor Bridge - Kotla Hasan	62		x		x	Form not properly filled.
12.	A.A. Associates	Kotla Hasan Shah - Fazilpur	65	x	x		x	
13.	International Meth. and Tech.	Fazilpur - Jampur	39	x	x	x		Form different
14.	Republic Engineers	Jampur - Taunsa	101		x	x	x	
15.	Engg. Consultants	D.G. Khan - Rt.Rd. Canal Bridge.	56		x	x	x	
16.	Azhar Ali	Retra Road Triman	42		x		x	
17.	Engineering Associates	Triman - Malana	62		x	x	x	
18.	Allied Engineering	Malana - Road Khel	41		x	x	x	
19.	Sh. Riaz Ahmed	Malana Road - Shahbaz Khel	38					Reconnaissance Report Not Received.
20.	Progressive Consultants.	Shehbaz Khel - Ghoriwala	60				x	Form not properly filled.
21.	Engg. & Tech.	Ghoriwala - Latambar	40				x	
22.	Indus Associated	Latambar - Samri Payan	80		x			Different forms.
23.	Associated Consultants	Samri Payan - Peshawar	86		x		x	
		TOTAL:	1,285	2	18	7	17	

Table 2
Distribution of Length According to Width of Pavement

S.NO	CONSULTANT	SECTION	LENGTH	WIDTH OF PAVEMENT (METERS)								
				3.5	4.5	5.5	6.5	7.5	8.5	> 8.5	N.S.	TOTAL
1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Zafar Associates	Kotri-Sann	87									0
2.	NES Pak	Sann-Bhan Sayyadan	86			32	52	2				86
3.	Pak Consolidated	Bhan Sayyadan-Kakk	47			7	39	1				47
4.	Abbasi & Associates	Kakkar-Badin	39		1	18	12	1			7	39
5.	M Ayub Abidi	Badin-Pakko	36									0
6.	Loya Associates	Pakko-Bangledero	40			28	3	14				40
7.	Associated Consultan	Bangledero-Shikarp	51			32	11	7	1			51
8.	ABM Engineers	Shikarpur-Ghouspur	51		4	13	34					51
9.	Zaheeruddin Consult	Ghouspur-Badani	34			17	16	1				34
10.	Noon Qayoom	Badani-Shor Nala	42		12		24	1		5		42
11.	Techno Conslut	Shor Nala-Kotla Ha	62		62							62
12.	A A Associates	Kotla Hasan-Fazilp	65	9	29		27					65
13.	Inter. Meth & Tech	Fazilpur-Pampur	39				34	5				39
14.	Republic Engineering	Taunsa-Retra	103		27		76					103
15.	Engineering Consulta	Retra-Triman	56	1	14	34	5	1		1		56
16.	Azhar Ali Consulting	Retra-Triman	42		42							42
17.	Engineering Associat	Triman-Kalana	63	38	18			7				63
18.	Allied Engineering C	Kalana-Rodikhel	41				23	14	1	3		41
19.	Sh. Riaz Ahmed	Rodikhel-Shehbazkh	38									0
20.	Progressive Consulta	Shehbazkhel-Ghoriw	59									0
21.	Engineering & Tech C	Ghoriwala-Latamber	40									0
22.	Indus Associated Cons	Latamber-Samarpaya	80	2	6	6	1	54	6	1	4	80
23.	Associated Consultin	Samarpayan -Peshaw	86				4	18	61		3	86
		TOTAL	1287	50	215	182	361	126	69	10	14	1027

Table 3
Traffic Volume on Indus Highway

S.NO	SECTION	LENGTH	POINT	M/CYC.	CAR	WAGON	BUS	TRUCK	TOTAL
1	2	3	4	5	6	7	8	9	10
1	KOTRI-SANN	67	N.A.						0
2	SANN-BHAN	86	N.S.	103	405	18	116	971	1648
3	BHAN-KUKKUR	47	BHAN BRIDGE	318	828		214	1382	2742
			JOHI JUNC	169	910		298	1599	2776
			NORO JUNC	145	852		271	2130	3408
			KUKKUR	401	615		198	852	2066
4	KUKKUR-BALADIA	39	KUKKUR	406	617		541	2574	4191
			NASIRABAD	257	506		634	2186	3873
5	BALADIA-PAKKO	36	N.S.	253	567		211	717	1765
			N.S.	376	766		138	886	2316
6	PAKKO-BANGLEDERO	40	PAKKO-LARKANA	941	1342	905	381	781	4350
			LARKANA-BANGLEDERO	531	804	415	230	801	2551
			LARKANA BYPASS	748	502	546	279	550	2709
7	BANGLEDERO-SHIKARP	50	BANGLDERO-RATODERO	371	517	253	194	306	1641
			RTDERO-GARIYASIN	339	308	287	118	134	1186
			GRIYASIN-SHIKARPUR	275	260	309	137	153	1054
8	SHIKARPUR-GHOUSPUR	52	N.S.	159	325	177	108	291	1640
9	GHOUSPUR-BADANI	34	UMERWAH-KANDKOT	224	271	224	130	885	1760
			KANDKOT-BADANI	214	326	268	269	917	2034
10	BADANI-SHORNULA BR	42	KASHMOR RLY STN	219	492		130	476	1297
			KASHMOR-KOJHAN	15	146		61	248	481
			KASHMOR-GUDDU	276	619		183	524	1602
11	SHORNULA-KOTLA HAS	62	N.S.	111	77	87	77	220	572
12	KOTLA HASAN-FAZILP	65	FAZILPUR	215	174	106	139	244	878
			KOTLA NASEER (N)	103	75	25	17	377	617
			KOTLA NASEER (S)	0	156	83	114	359	1212
13	FAZILPUR-JAMPUR	39	FAZILPUR		440		139	183	762
			NGASPUR		334		129	182	645
			JAMPUR		400		137	175	712
14	JAMPUR-TAUNSA BARA	101	R.P.CNL BR-KOT CHU	349	496		193	371	1439
			KOT CHUTA-CHOK KUL	1597	1083		362	536	3618
			CHOK KUTA CHK CHUR	654	681		585	516	3436
			CHOK CHURATA CHNT	313	382		222	411	1328
			CHNT JN DSK CNL BR	229	299		185	279	948
			CHNT JN-RETRA RD	82	82		18	167	349
15	DOKHAN-RETRA ROAD	56	AFTER TAUNSA JN	276	240	21	97	265	899
			BEFORE TAUNSA JN	316	313	120	168	219	1136
16	RETRA RD-TRIHAN JN	42	DUKALI	70	37	30	75	72	284
			KATHDARH	39	29	21	52	89	260
17	TRIHAN-CHANNI	62	N.S.	151	67	223	111	127	679
18	CHANNI-MALAN RD	41	BANNU-DIK	78	765		211	1163	3169
			CHASHMA Y JN	670	996		251	897	2914
			BASTI USTRANI-DIK	1059	993		371	923	3346
			Y JN-MALAN	462	511		206	301	1420
19	MALAN RD-SHAHBAZKH	38	FODIKHEL-PEZU	20	432	134	96	528	1209
			PEZU-SHAHBAZKHEL	75	720	146	154	726	1751
20	SHBZKHEL-GHORIWALA	60	SHAHBAZKHEL	49	999	229		1065	2344
			CHAZNIKHEL	56	1187	234		1074	2361
			TAJAZAI	137	1858	523		1312	3530
			SARAI NAURANG	211	2037	487		1504	4271
21	GHORIWALA-LATAMBER	40	BANNU WOOL MILL	1742	1973	1300	1091	3841	9747
			LATAMBER	388	1009	406	771	3089	5841
			GHORIWALA	620	1512	374	1017	3715	7263
22	LATAMBER-AHMEDKHEL	80	SURDOS	10	221	452	153	509	1345
			KARAPA	18	241	560	173	621	1653
23	AHMEDKHEL-PESHAWAR	86	FLIY TECH	9610	5767	1677	1700	1921	20683
			BADHABER	132	2500	977	674	1261	5464
			BEFORE KOHAT	897	2771	1019	578	1602	6921
			BRIDGE TOWARD TOI	151	2471	977	720	1529	5846

N.A. = NOT AVAILABLE
N.S. = NOT SPECIFIED

Schedule of Field Visit by Mr. M. Sadiq Swati Chief and Mr. Abdul Majeed, Deputy Chief, NTRC

Date	Day	From	To
23.12.87	Wednesday	Islamabad	Peshawar
24.12.87	Thursday	Peshawar	Bannu
25.12.87	Friday	Bannu	D.I.Khan
26.12.87	Saturday	D.I.Khan	D.G.Khan
27.12.87	Sunday	D.G.Khan	Guddu
28.12.87	Monday	Guddu	Sukkur
29.12.87	Tuesday	Sukkur	Dadu
30.12.87	Wednesday	Dadu	Hyderabad
31.12.87	Thursday	Hyderabad	Karachi

INDUS HIGHWAY FEASIBILITY STUDY

Origin - Destination Survey

Book No. _____ 1-3

Station No. _____ 4-5

Day _____ Date dd 6-7 mm 8-9

Road Section _____

Location of Survey Point _____

Survey Time From _____ Hrs/Min. To _____ Hrs/Min.

No.of forms filled in this Book _____ No. of Next Book _____

Name of Enumerator _____ Name of Supervisor _____

ANNEXURE-B

VEHICLE INTERVIEW FORM

Form No. _____ 10-11

Commencing Hour _____ 12-13

Type of Vehicle (Circle one)	M/Cy	Car	LCV	Wagon	Bus	Trucks					Other
						2 axl	3 axl	4 axl	5 axl	Other	
	01	02	03	04	05	06	07	08	09	10	11

14-15

Regn.No. _____ - _____ 16-19 code _____ 20-21 No.of Pass. _____ 22-24

Origin (Distt) _____ code _____ 25-27

Destin.(Distt) _____ code _____ 28-30

Type of Commods _____ code _____ 31-33

Unit _____ Quantity _____ 34-37 code _____ 38