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1.0 INTRODUCTION

1.1 Background

National Transport Research Centre (NTRC) was established in June 1974 in the Planning and Development Division, as one of its Technical Sections, to provide much needed research and development (R&D) support for planning and appraisal of transport sector projects/plans in a coordinated and cost-effective manner. NTRC was transferred as such to the Communications Division in November 1992. It is effectively functioning as an R&D Wing of the Ministry of Communications. The objective of the institution is to achieve self-sufficiency in the fields of Transport Planning, Road Engineering and Road Safety through indigenous R&D work, to undertake research studies in the field of Transport Planning and Engineering so that transport projects and plans are based on planning assumptions determined specifically for Pakistani condition, To provide countrywide transport information especially in the highly fragmented sub sectors of Roads and Road Transport, to implement/execute pilot demonstration projects to establish the viability of research efforts and to arrange training courses, seminars, etc. in the field of Transport Planning and Engineering.

NTRC, under this study, intends to carry out Origin-Destination Survey for Passengers and Freight Traffic at highways / roads / locations as identified. The description and the objectives of the assignment are; to make vehicle O-D matrices of all over Pakistan for inter-district transport, to analyze Level of Service of Highways and Motorways of Pakistan, to analyze characteristics of motor-vehicle traffic on major roads, to analyze characteristics of passenger transport and to analyze characteristics of freight transport.

1.2 Project Objectives

This study can be used to determine traffic impact on existing roads and identification of any other re-routing options available within the given resources as well as improvement plan, if required, to cater the existing traffic. For the aforementioned locations, a detailed review of the existing traffic studies was carried out to understand the traffic dynamics. Data was collected from various sources regarding traffic count and historic traffic growths, trends, etc.

The study is divided into two distinctive groups of activities:

- Field Surveys
- Analytical Studies

The main objectives of the Traffic Survey Study will be as follows:

- To collect vehicle Origin and Destination by conducting interviews for 24 hours at all locations in two rounds in different time period.
- To collect Traffic Volume Data Classified at all locations for 24 hours and confirm sampling rates for the road side O/D interview survey in two rounds in different time period.
- To collect Classified Traffic Volume and Origin Destination Data, cargo type, loaded volume and travel routes of trucks for 24 hours in two rounds in different time period.
- To collect Classified Traffic Volume and Origin Destination Data of public transport including Hiace, Minibuses and Large Buses and their fares in two rounds in different time period.

1.3 Scope of Project

The Survey consists of the following components:

- Roadside (Origin/Destination) Interview Survey(RIS)
- Classified Traffic Count Survey
- Passenger Interview Survey
- Punching of Raw data in to soft form and coding, zoning will be done for both rounds.
- Develop OD Matrices for of all locations separately as:
 - i. O-D Matrix for Car/ Jeep/ Pickup (NB/SB)
 - ii. O-D Matrix for 2-Axle/3-Axle (NB/SB)
 - iii. O-D Matrix for 4-Axle/5-Axle/6-Axle/ Tractor Trolley (NB/SB)
 - iv. O-D Matrix for Hiace/ Mini Buses (NB/SB)
 - v. O-D Matrix for Large Buses (NB/SB)
 - vi. O-D Matrix for Pickups (NB/SB)

Sum-up both (NB/SB) matrices and compare it with traffic volume to obtain the sample size of each location.

2.0 TRAFFIC COUNT AND ORIGIN DESTINATION OF SURVEY LOCATIONS

2.1 Selected Locations

There are total twenty-eight (218) locations as identified by the Client for 24-hours Traffic Counts and O-D Survey for whole Pakistan (all Packages). Figure shows all 218 locations selected for survey. The whole project is divided in total Six (6) packages, detail of the packages is presented in the following Table.

Table 1: Details of All packages of O-D Survey

Package	Location Description	Locations Sequence	No of Locations
Package - I	GB/AJK	1 to 27	27
Package - II	FATA + KPK	28 to 63	36
Package - III	PUNJAB-1	64 to 140	77
Package - IV	PUNJAB-2	141 to 168	28
Package - V	SINDH	169 to 193	25
Package - VI	BALUCHISTAN	194 to 218	25
Total Number of Locations (All Packages)			218

Location map of all locations of all packages are shown in the following figures

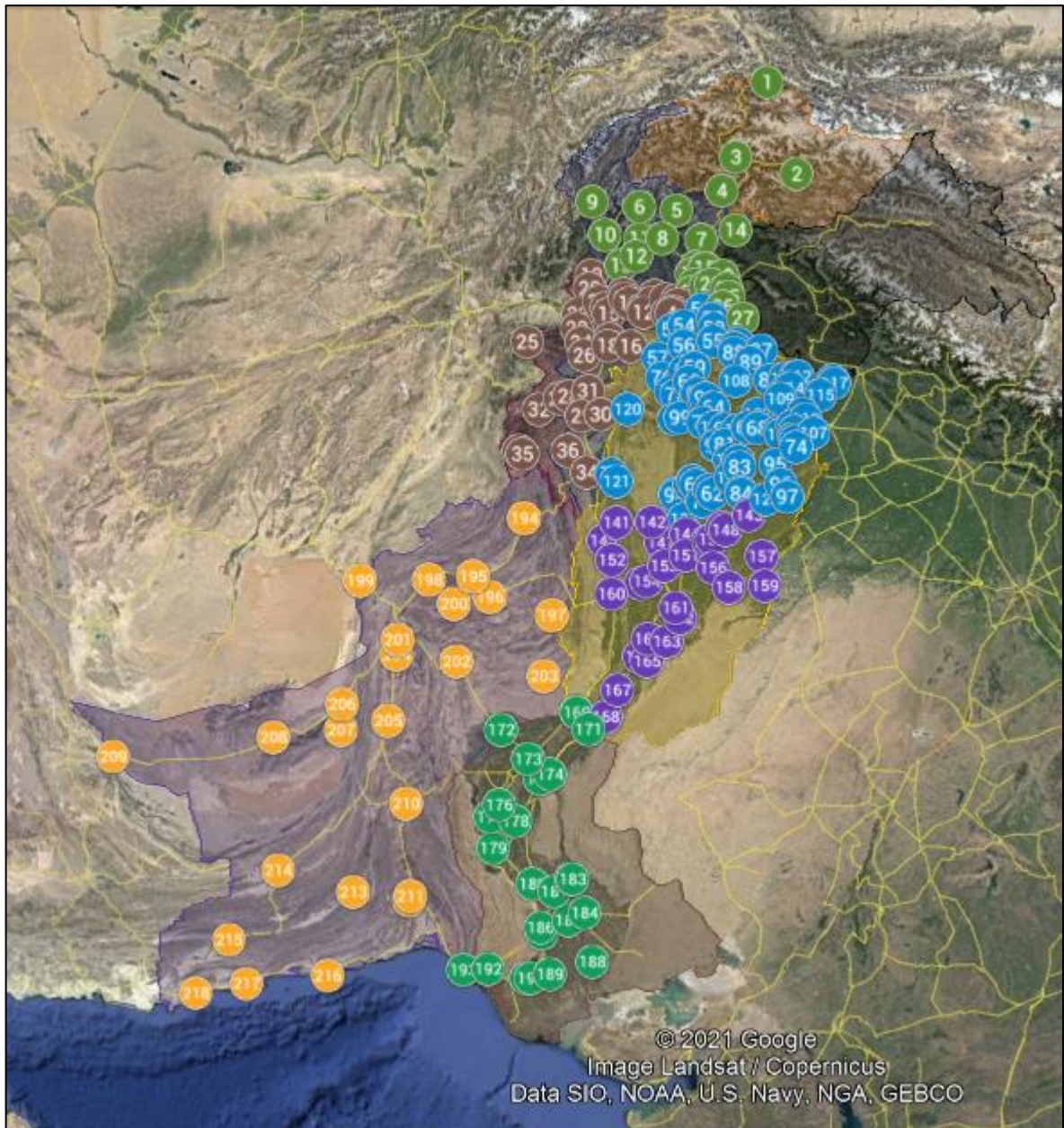


Figure 2-1: Location Map of all Packages of O-D Survey shown on Google Earth Imagery

2.2 Package – I (GB/AJK)

All locations of Package – I are located in GB, AJK, Chitral and Hazara. There are 27 locations as identified by the Client for 24-hours Traffic Counts and O-D Survey for Package-I. Figure shows all 27 locations of Package - I.

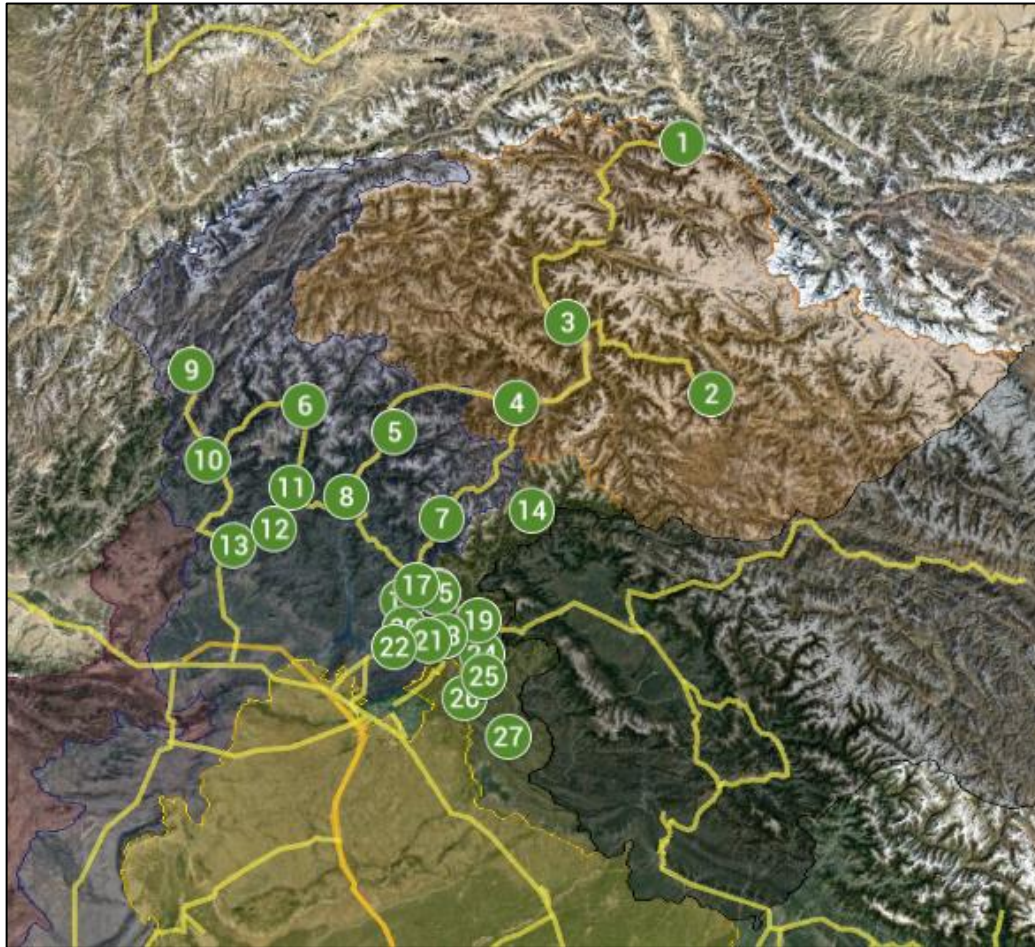


Figure 2-2: Location map of Package - I

Table 2: Description of O-D Survey Locations of Package-I

Package-I O-D Survey Locations Gilgit Baltistan, Azad Jammu & Kashmir, Chitral, Hazara Division (27 Locations)			
ID	Location Description	ID	Location Description
1	Pak-China Border (Khunjrab)	14	Near Neelum AJK
2	Near Skardu	15	S-2 Near Muzaffarabad AJK
3	Near Gilgit	16	Muzaffarabad AJK
4	N-15 Near Chilas	17	Mansehra-Talhatta Road (Manshra - Muz...
5	N-35 (Dasu - Challas)	18	N-35 Near Mansehra
6	Near Kalam	19	Near Hattian AJK
7	Near Kaghan	20	Near Abbottabad N-35
8	N-90 (Besham -Khawezakhel)	21	Near Nathia Gali
9	Near Chitral	22	N-35 Near Havelian
10	N-45 Near Dir	23	N-75 (Murree - Muzaffarabad)
11	N-95 Near Swat	24	Near Bagh AJK
12	Near Mingora	25	Near Rawalakot
13	KP-6 (N-45 Chakdara to Dir)	26	Near Azad Pattan AJK
		27	Near Kotli AJK

2.2.1 Location ID 01

Location ID 01 located on N-35 Karakoram Highway at Khunjrab Pass Pakistan China Border. It is 6 to 7 meters two lanes Rural highway (One Lane for each side of traffic) which connects two countries Pakistan and China. Traffic going towards China is taken as North Bound NB. Traffic going towards Pakistan is taken as South Bound SB. Figure 2.3 and Figure 2.4 shows Location ID 01.



Figure 2-3: Satellite Image of Location ID 01



Figure 2-4: Location ID 01 during Survey

2.2.2 Location ID 02

Location ID 02 located on S-1 Strategic Road. It is 4 to 5 meters two lanes Rural highway (One Lane for each side of traffic) which connects two cities Skardu and Jaglot. Traffic going towards Jaglot is taken as North Bound NB. Traffic going towards Skardu is taken as South Bound SB. Figure 2.5 and Figure 2.6 shows Location ID 02.



Figure 2-5: Satellite Image of Location ID 02



Figure 2-6: Location ID 02 during field survey

2.2.3 Location ID 03

Location ID 03 located on main Karakoram Highway N-35 near to Gilgit City. It is 2 lanes each side main carriageway. Location ID 03 connects two cities Gilgit and Jaglot. Traffic going from Jaglot to Gilgit is taken as North Bound NB. Traffic going from Gilgit to Jaglot is taken as South Bound SB. Figure 2.7 and Figure 2.8 shows Location ID 03.

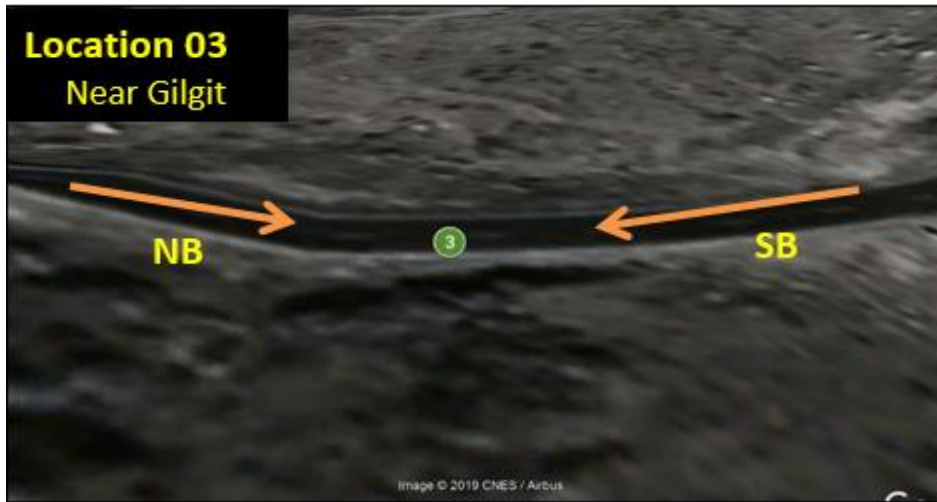


Figure 2-7: Satellite Image of Location ID 03



Figure 2-8: Location ID 03 During Field Survey

2.2.4 Location ID 04

Location ID 04 located on N-15. It is 6 to 7 meters two lanes Rural highway (One Lane for each side of traffic). It's a bypass road for traffic coming from Manshera to Gilgit. Traffic coming from Naran to Chillas is taken as North Bound NB. Traffic going from Chillas to Naran is taken as South Bound SB. Figure 2.9 and Figure 2.10 shows Location ID 04

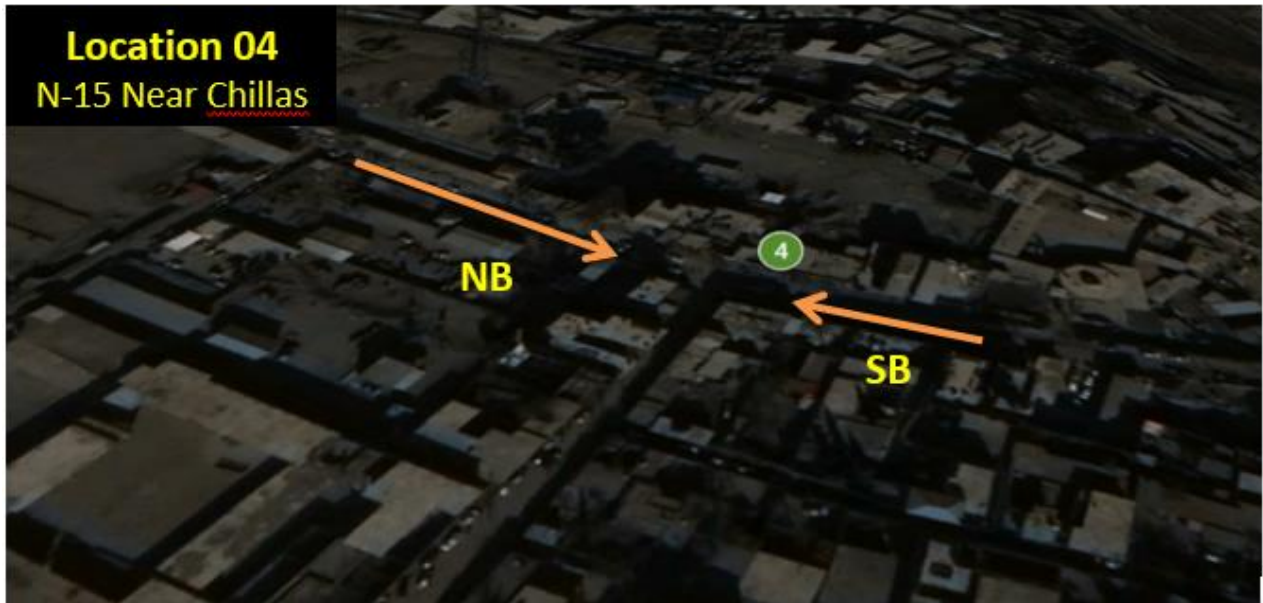


Figure 2-9: Satellite Image of Location ID 04

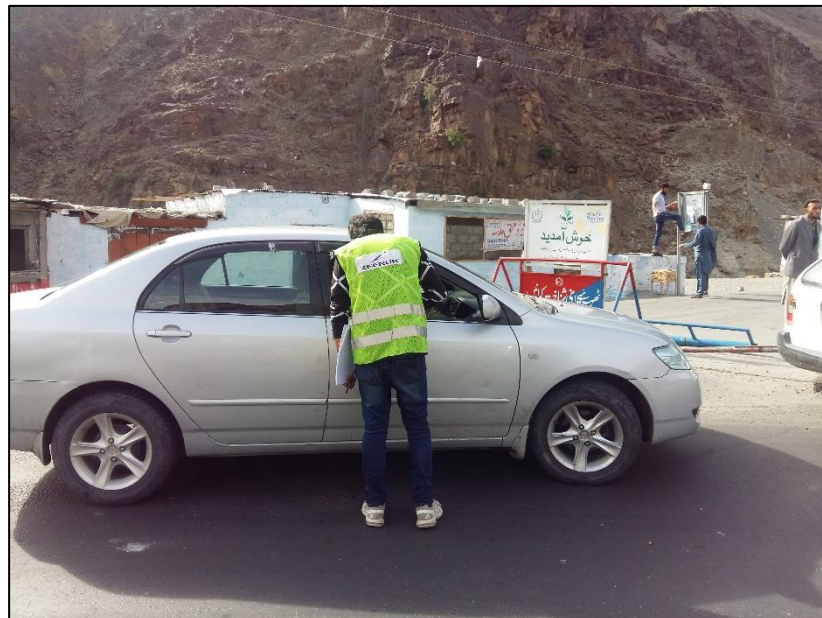


Figure 2-10: Location ID 04 during field Survey

2.2.5 Location ID 05

Location ID 05 located on Karakoram Highway N-35. It is 2 lanes main carriageway. Location ID 05 connects two cities Dasu and Chillas. Traffic going from Dasu to Chillas is taken as North Bound NB. Traffic going from Chillas to Dasu is taken as South Bound SB. Figure 2.11 and Figure 2.12 shows Location ID 05.



Figure 2-11: Satellite Image of Location ID 05



Figure 2-12: Location ID 05 during field Survey

2.2.6 Location ID 06

Location ID 06 located on N-95 near Kalam. It is 5 to 6 meters two lanes Rural highway (One Lane for each side of traffic) which connects two cities Mingora and Kalam. Traffic going from Mingora to Kalam is taken as North Bound NB. Traffic going from Kalam to Mingora is taken as South Bound SB. Figure 2.13 and Figure 2.14 shows Location ID 06.



Figure 2-13: Satellite Image of Location ID 06



Figure 2-14: Location ID 06 during field Survey

2.2.7 Location ID 07

Location ID 07 located on N-15. It is 5 to 6 meters two lanes National Highway (One Lane for each side of traffic) which connects two cities Balakot and Kaghan. Traffic going from Balakot to Kaghan is taken as North Bound NB. Traffic going from Kaghan to Balakot is taken as South Bound SB. Figure 2.15 and Figure 2.16 shows Location ID 07.



Figure 2-15: Satellite Image of Location ID 07



Figure 2-16: Location ID 07 during field Survey

2.2.8 Location ID 08

Location ID 08 located on N-90 Besham-Khawazakhela. It is 2 lanes National Highway. Location ID 08 connects two cities Besham and Khawazakhela. Traffic going from Khawazakhela to Besham is taken as North Bound NB. Traffic going from Besham to Khawazakhela is taken as South Bound SB. Figure 2.17 and Figure 2.18 shows Location ID 08.



Figure 2-17: Satellite Image of Location ID 08



Figure 2-18: Location ID 08 during field survey

2.2.9 Location ID 09

Location ID 09 located on N-45. Location ID 09 connects two cities Dir and Chitral. Traffic going from Dir to Chitral is taken as North Bound NB. Traffic going from Chitral to Dir is taken as South Bound SB. Figure 2.19 and Figure 2.20 shows Location ID 09.

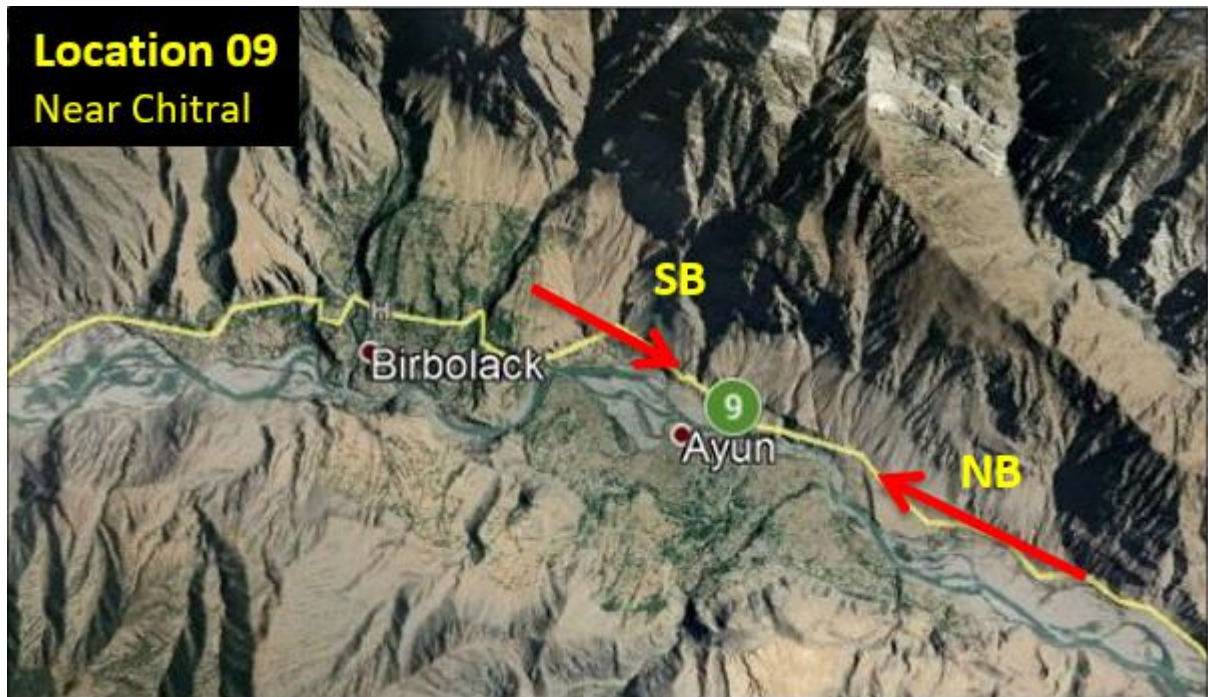


Figure 2-19: Satellite Image of Location ID 09



Figure 2-20: Location ID 09 during Field Survey

2.2.10 Location ID 10

Location ID 10 located on N-45 near Dir. It is 5 to 6 meters two lanes National Highway (One Lane for each side of traffic) which connects two cities Dir and Chakdara. Traffic going from Chakdara to Dir is taken as North Bound NB. Traffic going from Dir to Chakdara is taken as South Bound SB. Figure 2.21 and Figure 2.22 shows Location ID 10.



Figure 2-21: Satellite Image of Location ID 10



Figure 2-22: Location ID 10 during Field Survey

2.2.11 Location ID 11

Location ID 11 located on N-95 near Swat. It is 2 lanes each side National Highway. Location ID 11 connects two cities Mingora and Bahrain. Traffic going from Mingora to Bahrain is taken as North Bound NB. Traffic going from Bahrain to Mingora is taken as South Bound SB. Figure 2.23 and Figure 2.24 shows Location ID 11.



Figure 2-23: Satellite Image of Location ID 11



Figure 2-24: Location ID 11 during Field Survey

2.2.12 Location ID 12

Location ID 12 located on N-95. It is 5 to 6 meters' National Highway (One Lane for each side of traffic). It connects two cities Chakdara and Mingora. Traffic going from Chakdara to Mingora is taken as North Bound NB. Traffic going from Mingora to Chakdara is taken as South Bound SB. Figure 2.25 and Figure 2.26 shows Location ID 12.



Figure 2-25: Satellite Image of Location ID 12



Figure 2-26: Location ID 12 during Field Survey

2.2.13 Location ID 13

Location ID 13 located on N-45. It is 5 to 6 meters of National Highway. Location ID 13 connects two cities Chakdara and TimerGrah. Traffic going from Chakdara to TimerGrah is taken as North Bound NB. Traffic going from TimerGrah to Chakdara is taken as South Bound SB. Figure 2.27 and Figure 2.28 shows Location ID 13.



Figure 2-27: Satellite Image of Location ID 13



Figure 2-28: Location ID 13 during Field Survey

2.2.14 Location ID 14

Location ID 14 located near Neelum Valley. It is a two lane 4 to 5 meters' road. It connects Muzaffarabad with Sharda. Traffic going from Muzaffarabad to Sharda is taken as North Bound NB. Traffic going from Sharda to Muzaffarabad is taken as South Bound SB. Figure 2.29 and Figure 2.30 shows Location ID 14.



Figure 2-29: Satellite Image of Location ID 14



Figure 2-30: Location ID 14 during Field Survey

2.2.15 Location ID 15

Location ID 15 located on S-2. It is 2 lanes Strategic Road. It connects Kohala with Muzaffarabad. Traffic going from Kohala to Muzaffarabad is taken as North Bound NB. Traffic going from Muzaffarabad to Kohala is taken as South Bound SB. Figure 2.31 and Figure 2.32 shows Location ID 15.



Figure 2-31: Satellite Image of Location ID 15



Figure 2-32: Location ID 15 during Field Survey

2.2.16 Location ID 16

Location ID 16 located near Muzzaffarabad on S-4. It is 4 to 5 meters two lanes Strategic Road (One Lane for each side of traffic). It connects two cities Muzzaffarabad and GrahiHabibullah. Traffic going from Muzzaffarabad to GrahiHabibullah is taken as North Bound NB. Traffic going from GrahiHabibullah to Muzzaffarabad is taken as South Bound SB. Figure 2.33 and Figure 2.34 shows Location ID 16.



Figure 2-33: Satellite Image of Location ID 16



Figure 2-34: Location ID 16 during Field Survey

2.2.17 Location ID 17

Location ID 17 located on Manshera-Talhatta Road. It is 5 to 6 meters two lanes rural highway (One Lane for each side of traffic). It connects two cities Muzaffarabad and Manshera. Traffic going from Manshera to Muzaffarabad is taken as North Bound NB. Traffic going from Muzaffarabad to Manshera is taken as South Bound SB. Figure 2.35 and Figure 2.36 shows Location ID 17.

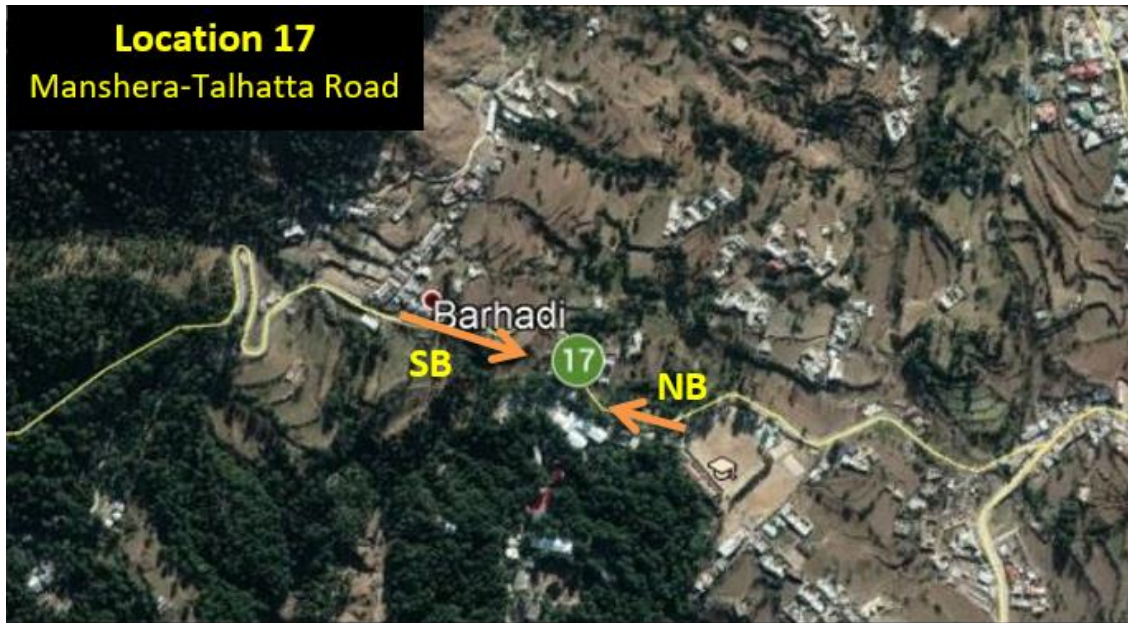


Figure 2-35: Satellite Image of Location ID 17



Figure 2-36: Location ID 17 during Field Survey

2.2.18 Location ID 18

Location ID 18 located on Karakoram Highway. It is 5 to 6 meters two lanes National Highway (One Lane for each side of traffic). It connects two cities Abbottabad and Manshera. Traffic going from Abbottabad to Manshera is taken as North Bound NB. Traffic going from Manshera to Abbottabad is taken as South Bound SB. Figure 2.37 and Figure 2.38 shows Location ID 18.



Figure 2-37: Satellite Image of Location ID 18



Figure 2-38: Location ID 18 during Field Survey

2.2.19 Location ID 19

Location ID 19 located near Hattian AJK. It is 5 to 6 meters two lanes Strategic Road S-3 (One Lane for each side of traffic). It connects two cities Muzaffarabad and Chakothi. Traffic going from Muzaffarabad to Chakothi is taken as North Bound NB. Traffic going from Chakothi to Muzaffarabad is taken as South Bound SB. Figure 2.39 and Figure 2.40 shows Location ID 19.

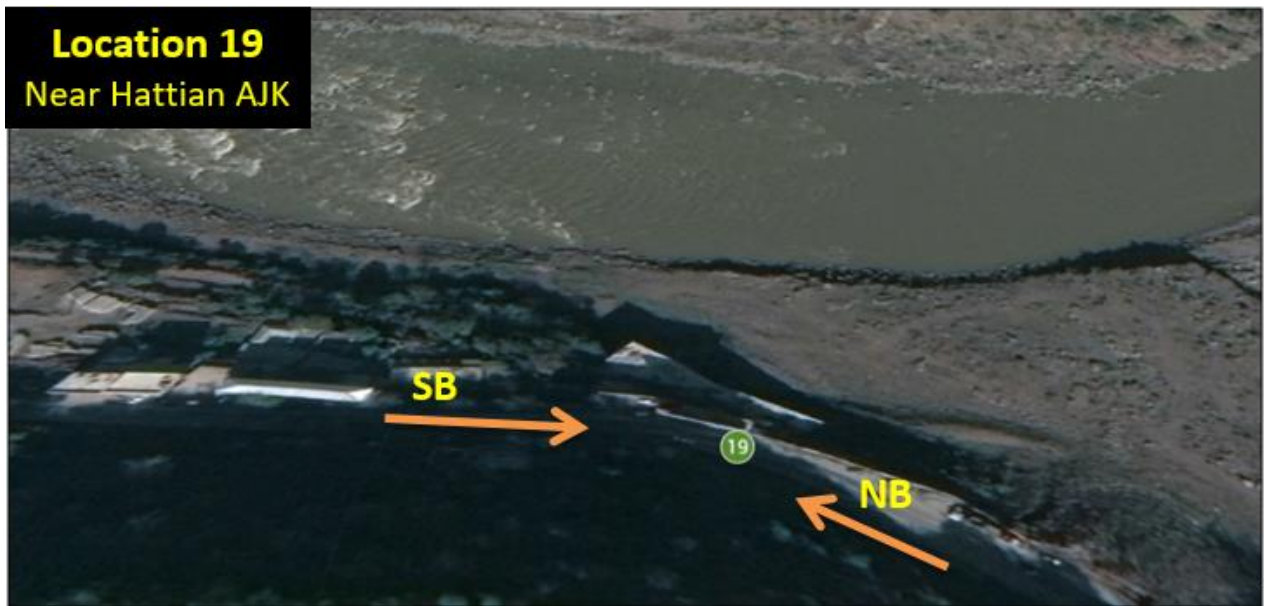


Figure 2-39: Satellite Image of Location ID 19



Figure 2-40: Location ID 19 during Field Survey

2.2.20 Location ID 20

Location ID 20 located on National Highway N-35. It is 6 to 7 meters of National Highway. Location ID 20 connects two cities Havelien and Abbottabad. Traffic going from Havelien to Abbottabad is taken as North Bound NB. Traffic going from Abbottabad to Havelien is taken as South Bound SB. Figure 2.41 and Figure 2.42 shows Location ID 20.



Figure 2-41: Satellite Image of Location ID 20



Figure 2-42: Location ID 20 during Field Survey

2.2.21 Location ID 21

Location ID 21 located on Nathia Gali Road. It is 2 lanes rural highway. Location ID 21 connects two cities Abbottabad and Nathia Gali. Traffic going from Abbottabad and Nathia Gali is taken as North Bound NB. Traffic going from Nathia Gali to Abbottabad is taken as South Bound SB. Figure 2.43 and Figure 2.44 shows Location ID 21.



Figure 2-43: Satellite Image of Location ID 21



Figure 2-44: Location ID 21 during Field Survey

2.2.22 Location ID 22

Location ID 22 located on N-35. It is 2 lanes National Highway. Location ID 22 connects two cities Haripur and Havelien. Traffic going from Haripur to Havelien is taken as North Bound NB. Traffic going from Havelien to Haripur is taken as South Bound SB. Figure 2.45 and Figure 2.46 shows Location ID 22.



Figure 2-45: Satellite Image of Location ID 22



Figure 2-46: Location ID 22 during Field Survey

2.2.23 Location ID 23

Location ID 23 located on N-75. It is 2 lanes National Highway. Location ID 23 connects two cities Murree and Muzaffarabad. Traffic going from Murree to Muzaffarabad is taken as North Bound NB. Traffic going from Muzaffarabad to Murree is taken as South Bound SB. Figure 2.47 and Figure 2.48 shows Location ID 23.



Figure 2-47: Satellite Image of Location ID 23



Figure 2-48: Location ID 23 during Field Survey

2.2.24 Location ID 24

Location ID 24 located near Bagh on Bagh Highway. It is 3 to 4 meters two lanes Rural highway (One Lane for each side of traffic). It connects two cities Arja and Bagh. Traffic going from Arja to Bagh is taken as North Bound NB. Traffic going from Bagh to Arja is taken as South Bound SB. Figure 2.49 and Figure 2.50 shows Location ID 24.



Figure 2-49: Satellite Image of Location ID 24



Figure 2-50: Location ID 24 during Field Survey

2.2.25 Location ID 25

Location ID 25 located near Rawalakot on Rawalakot road. It is 5 to 6 meters two lanes rural highway (One Lane for each side of traffic). It connects two cities Azad Pattan Gul and Rawalakot. Traffic going from Azad Pattan Gul to Rawalakot is taken as North Bound NB. Traffic going from Rawalakot to Azad Pattan Gul is taken as South Bound SB. Figure 2.51 and Figure 2.52 shows Location ID 25.



Figure 2-51: Satellite Image of Location ID 25



Figure 2-52: Location ID 25 during Field Survey

2.2.26 Location ID 26

Location ID 26 located near Azad Pattan Bridge AJK. It is 2 lanes Rural Highway. Location ID 26 connects two cities Kahuta and Azad Pattan Gul. Traffic going from Kahuta to Azad Pattan Gul is taken as North Bound NB. Traffic going from Azad Pattan Gul to Kahuta is taken as South Bound SB. Figure 2.53 and Figure 2.54 shows Location ID 26.



Figure 2-53: Satellite Image of Location ID 26



Figure 2-54: Location ID 26 during Field Survey

2.2.27 Location ID 27

Location ID 27 located near Kotli AJK. It is 2 lanes Rural Highway. Location ID 27 connects two cities Mirpur and Kotli. Traffic going from Mirpur to Kotli is taken as North Bound NB. Traffic going from Kotli to Mirpur is taken as South Bound SB. Figure 2.55 and Figure 2.56 shows Location ID 27.



Figure 2-55: Satellite Image of Location ID 27



Figure 2-56: Location ID 27 during Field Survey

2.3 Package – II (FATA + KPK)

Package – II locations are located in FATA and KPK. There are 36 locations as identified by the Client for 24-hours Traffic Counts and O-D Survey for package-II. Figure shows all locations of Package - II while details of locations are presented in Table.



Figure 2-57: Package - II O-D Survey Locations marked on Google earth Imagery

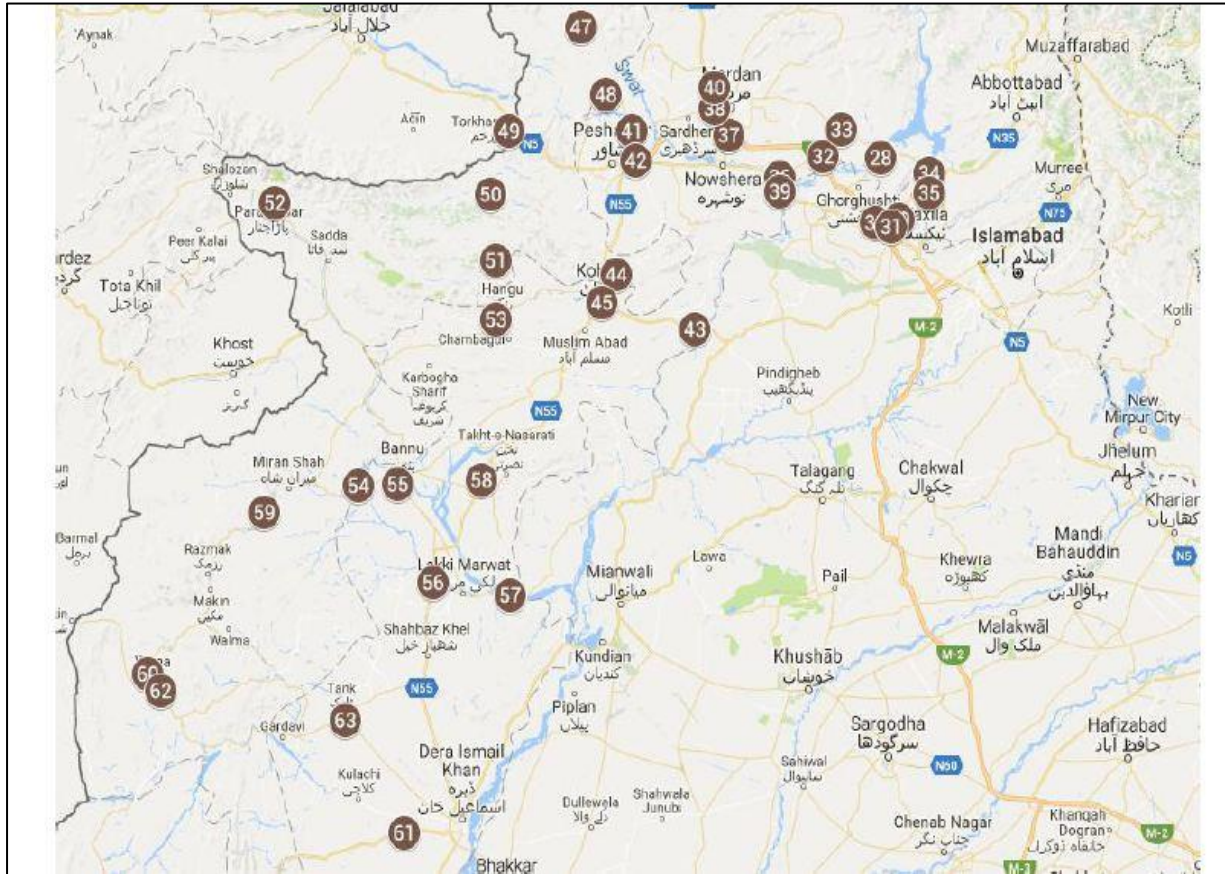


Figure 2-58: All locations of Package - II

Table 3: Details of all Locations of Package - II

ID	Location Description	ID	Location Description	ID	Location Description
28	Near Topi (Swabi)	40	N-45 (Mardan - Malakand)	52	FATA Near Parachinar
29	N-35 (Hassanabdal - Haripur)	41	KP-2 (Charsadda Road)	53	Near Hangu
30	M-1 Burhan Interchange (NB/SB)	42	M-1 Motorway Toll Plaza at Peshawar (NB/SB)	54	Bannu to Miran Shah Road
31	N-5 (Taxila - Burhan)	43	Kohat Fateh Jang Road (Kushargarh Bridge)	55	Near Bannu (Bannu Road)
32	M-1 Jehangira Interchange (NB/SB)	44	N-55 (Peshawar - Kohat)	56	N-55 Near Lakki Marwat
33	Near Swabi (Swabi - Topi Road)	45	N-80 Near Kohat	57	Essa Khel Mianawali Road (Isa Khel - Lakki)
34	Ghazi Road (Haripur - Swabi)	46	FATA Bajaur Agency	58	N-55 (Karak - Bannu)
35	KP-1 (Hattar - Haripur)	47	FATA Mohmand Agency	59	FATA North Waziristan Agency
36	KP-5 (Swabi - Jehangira Road)	48	KP-3 (Mohmand Agency Road)	60	Makin Road (Razmak - Tanai)
37	M-1 Rashakai Interchange (NB/SB)	49	Pak-Afghan Border (Torkham)	61	N-50 (D.I.Khan - Zhob)

ID	Location Description	ID	Location Description	ID	Location Description
38	KP-4 (Charsadda - Mardan Road)	50	FATA Khyber Agency	62	FATA Near Wana
39	N-5 (Attock - Nowshera)	51	FATA Orkzai Agency	63	Near Tank (Tank - D.I Khan Road)

2.3.1 Location ID 28

Location ID 29 located on N-35 (also known as Karakoram Highway) near Hassan Abdal. It is 9 to 10 meters' National highway which starts from Hasan Abdal in the Punjab province of Pakistan to the Khunjerab Pass in Gilgit-Baltistan. Traffic going from Hassan Abdal to Haripur is taken as North Bound NB. Traffic going from Haripur to Hassan Abdal is taken as South Bound SB. Figure 2.59 shows Location ID 28.



Figure 2-59: Satellite Image of Location ID 28

2.3.2 Location ID 29

Location ID 29 located on N-35 (also known as Karakoram Highway) near Hassan Abdal. It is 9 to 10 meters' National highway which starts from Hasan Abdal in the Punjab province of Pakistan to the Khunjerab Pass in Gilgit-Baltistan. Traffic going from Hassan Abdal to Haripur is taken as North Bound NB. Traffic going from Haripur to Hassan Abdal is taken as South Bound SB. Figure 2.60 and Figure 2.61 shows Location ID 29.

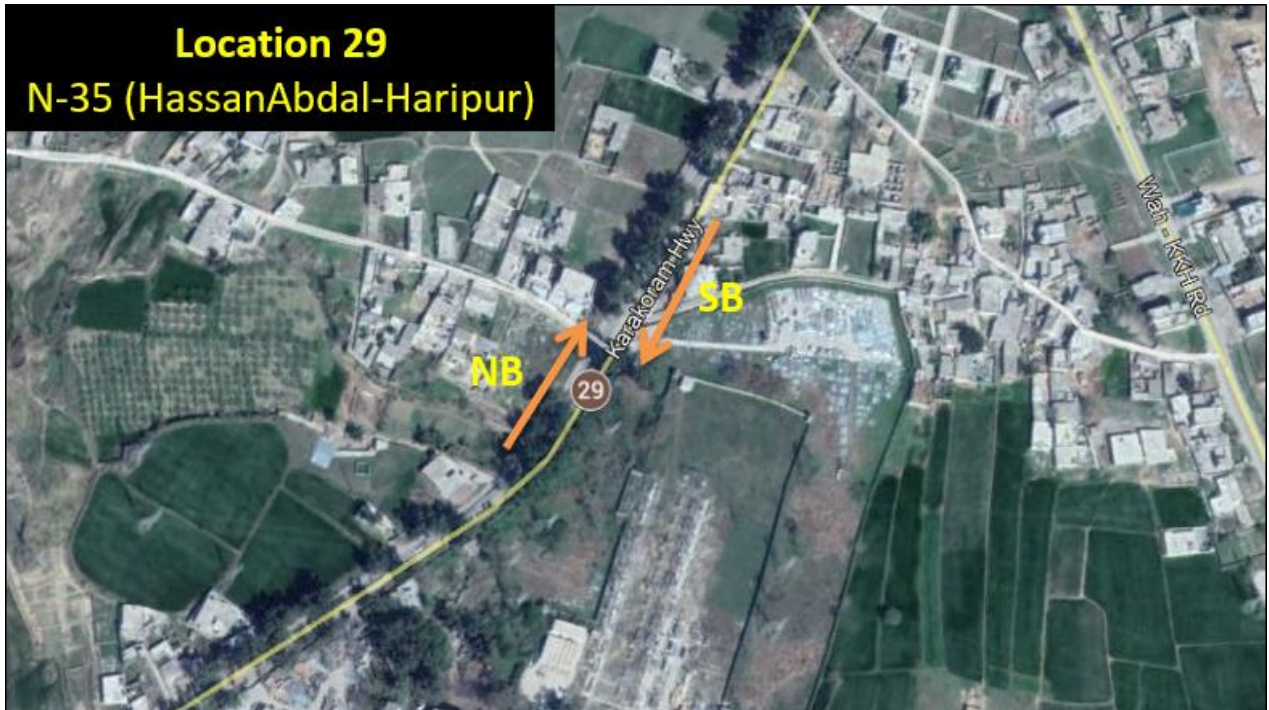


Figure 2-60: Satellite Image of Location ID 29



Figure 2-61: Location ID 29 during Field Survey



2.3.3 Location ID 30

Location ID 30 located on M-1 Peshawar-Islamabad Motorway Near Burhan Interchange. Location ID 30 connects two major cities Peshawar and Islamabad. Traffic going from Islamabad/Rawalpindi to Peshawar is taken as North Bound NB. Traffic going from Peshawar to Islamabad/Rawalpindi is taken as South Bound SB. Figure 2.62 and Figure 2.63 shows Location ID 30.



Figure 2-62: Satellite Image of Location ID 30



Figure 2-63: Location ID 30 during Field Survey

2.3.4 Location ID 31

Location ID 31 located on N-5 near Hassan Abdal. It is National Highway median separated with two lanes on each side for traffic movement which connects different major cities along its alignment from Peshawar to Karachi. Traffic going from Rawalpindi/Islamabad towards Peshawar is taken as North Bound NB. Traffic going from Peshawar side towards

Rawalpindi/Islamabad is taken as South Bound SB. Figure 2.64 and Figure 2.65 shows Location ID 31.



Figure 2-64: Satellite Image of Location ID 31



Figure 2-65: Location ID 31 during Field Survey

2.3.5 Location ID 32

Location ID 32 located on M-1 Peshawar Islamabad Motorway near Swabi Interchange. Location ID 32 connects two major cities Peshawar and Islamabad. Traffic going from Islamabad/Rawalpindi side towards Swabi and Peshawar side is taken as North Bound NB while the reverse is taken as South Bound SB. Figure 2.66 and Figure 2.67 shows Location ID 32.



Figure 2-66: Satellite Image of Location ID 32



Figure 2-67: Location ID 32 during Field Survey

2.3.6 Location ID 33

Location ID 33 located on Swabi to Topi road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic) which connects Swabi with Topi. Traffic going from Rawalpindi/Topi side towards Swabi is taken as North Bound NB. Traffic going from Swabi to Topi and Rawalpindi side is taken as South Bound SB. Figure 2.68 shows Location ID 33.



Figure 2-68: Satellite Image of Location ID 33

2.3.7 Location ID 34

Location ID 34 located on Ghazi Road. It is 6 to 7 meters two lanes urban highway (One Lane for each side of traffic) which connects Haripur with Topi and Swabi. Traffic going from Haripur to Swabi is taken as North Bound NB. Traffic going from Swabi side towards Haripur is taken as South Bound SB. Figure 2.69 shows Location ID 34.

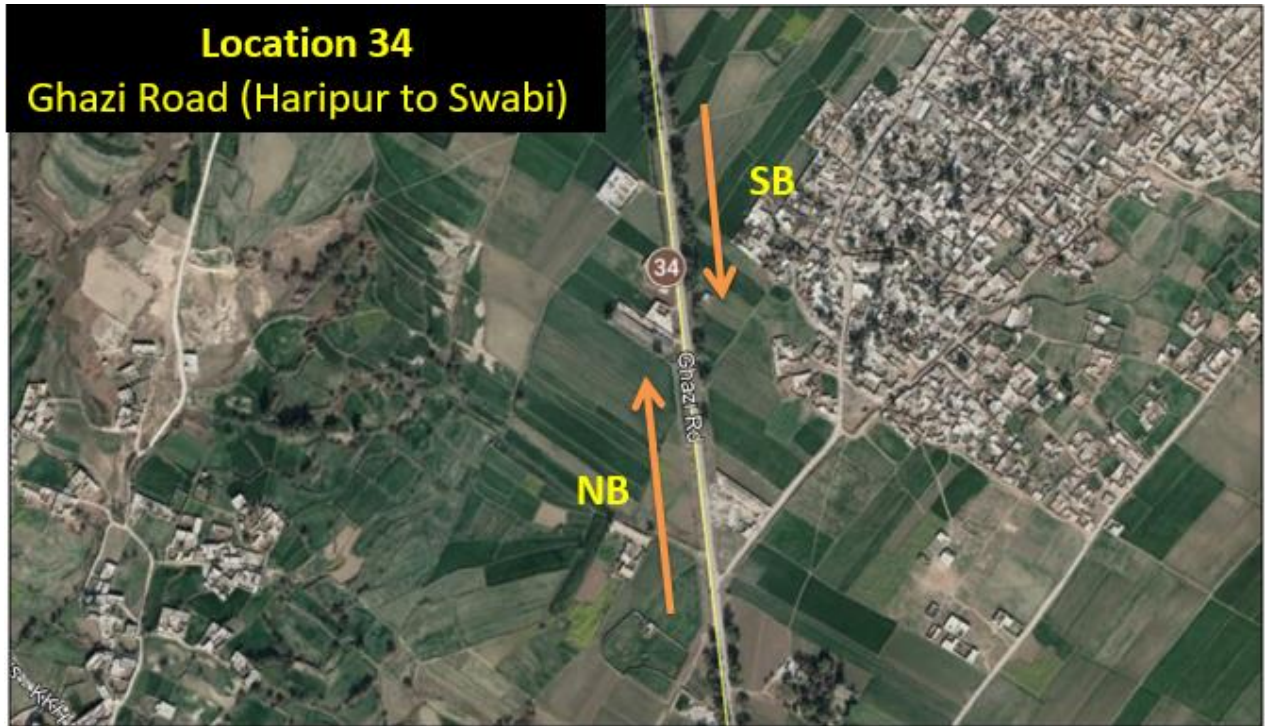


Figure 2-69: Satellite Image of Location ID 34

2.3.8 Location ID 35

Location ID 35 located on Kot Najeebullah Road (Hattar to Haripur) near Hattar. Location ID 35 connects two cities Hattar and Haripur. Traffic going from Hattar to Haripur is taken as North Bound NB. Traffic going from Haripur to Hattar is taken as South Bound SB. Figure 2.70 shows Location ID 35.

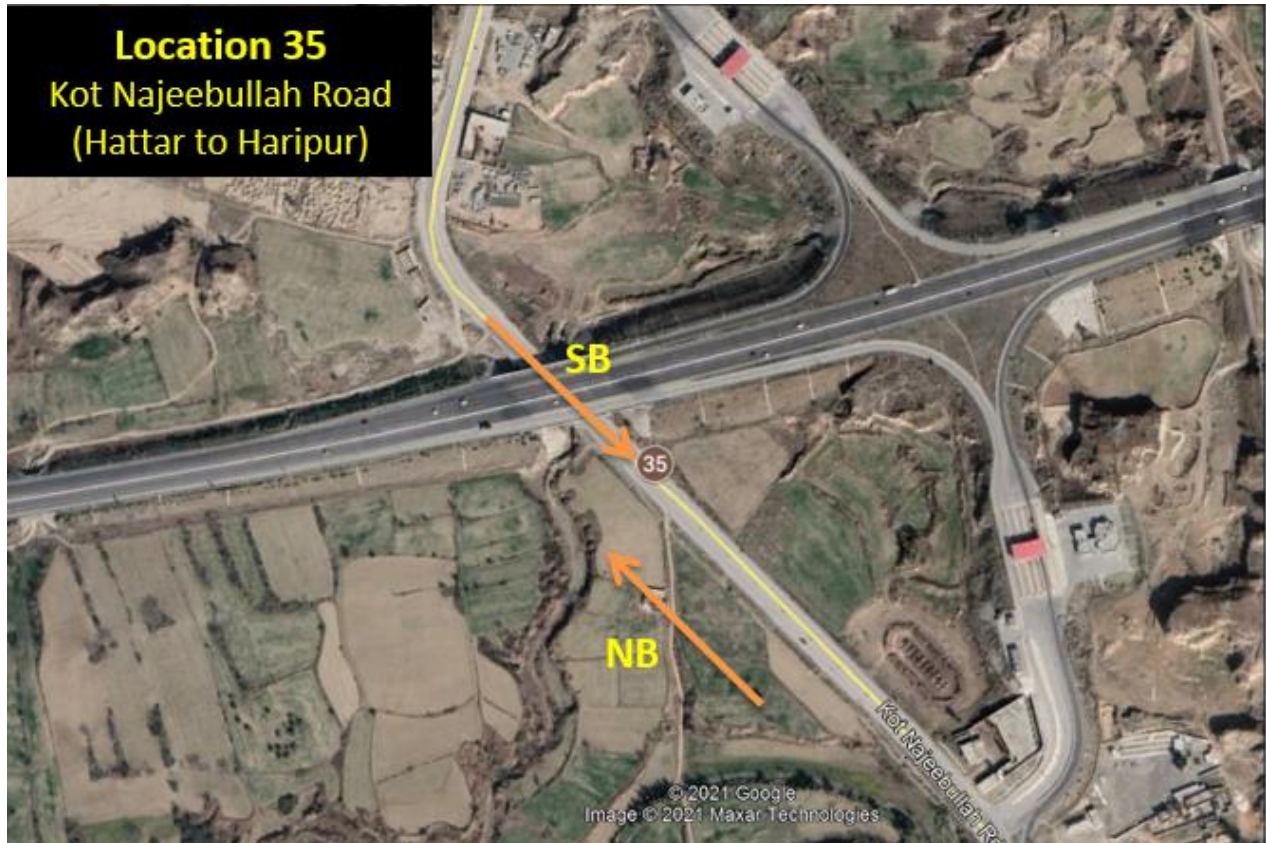


Figure 2-70: Satellite Image of Location ID 35

2.3.9 Location ID 36

Location ID 36 located on Swabi-Jahangira road. It is 2 lanes each side main carriageway. Location ID 36 connects two major locations Swabi and Jahangira. Traffic going from Jahangira to Swabi is taken as North Bound NB. Traffic going from Swabi to Jahangira is taken as South Bound SB. Figure 2.71 & Figure 2.72 shows Location ID 36.



Figure 2-71: Satellite Image of Location ID 36



Figure 2-72: Location ID 36 during Field Survey

2.3.10 Location ID 37

Location ID 37 located on M-1 near Rashakai Interchange. This Location ID connects Mardan with Peshawar and Islamabad. Traffic going from Mardan to Peshawar is taken as North Bound NB. Traffic going from Peshawar to Mardan is taken as South Bound SB. Figure 2.73 and Figure 2.74 shows Location ID 37.



Figure 2-73: Satellite Image of Location ID 37



Figure 2-74: Location ID 37 during Field Survey

2.3.11 Location ID 38

Location ID 38 located on Charsadda – Mardan road. It is 2 lanes each side median separated main carriageway. Location ID 38 connects two cities Charsadda and Mardan. Traffic going from Charsadda to Mardan is taken as North Bound NB. Traffic going from Mardan to Charsadda is taken as South Bound SB. Figure 2.75 and Figure 2.76 shows Location ID 38.



Figure 2-75: Satellite Image of Location ID 38



Figure 2-76: Location ID 38 during Field Survey

2.3.12 Location ID 39

Location ID 39 located on National Highway N-5 near KhairAbad. It is 2 lanes each side median separated main Highway. It connects Attock and KhairAbad with Nowshera city. Traffic going from Attock to Nowshera is taken as North Bound NB. Traffic going from Nowshera to Attock side is taken as South Bound SB. Figure 2.77 shows Location ID 39.

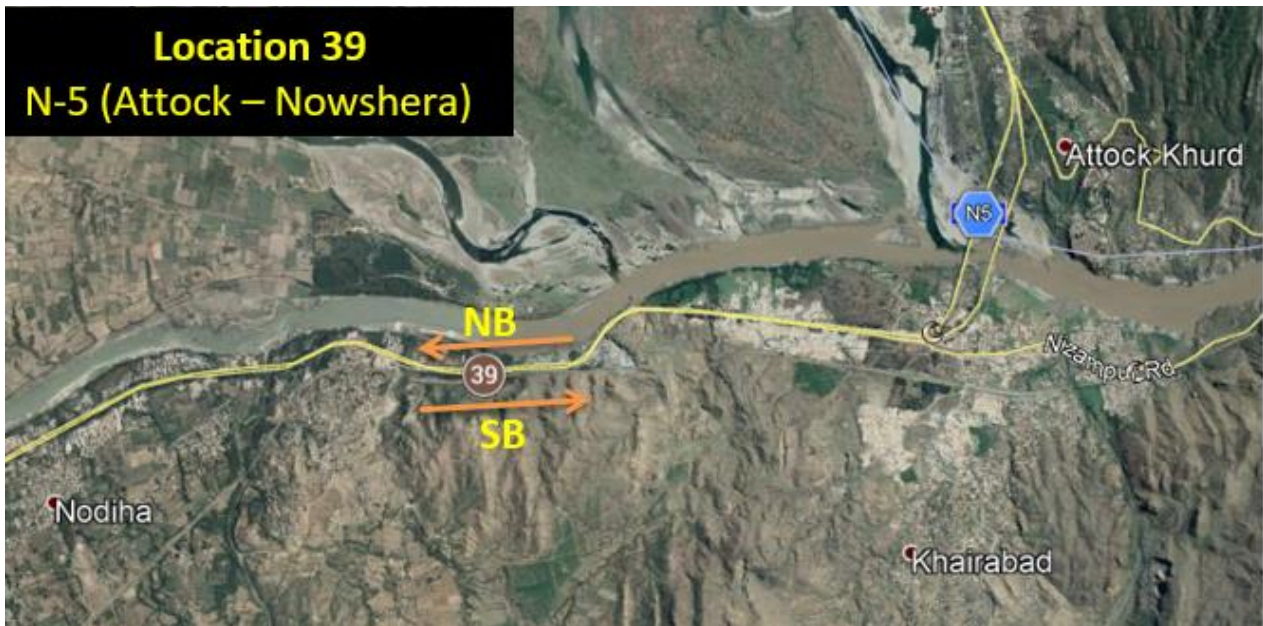


Figure 2-77: Satellite Image of Location ID 39

2.3.13 Location ID 40

Location ID 40 located on National Highway N-45 near Takhtbhai. It is 2 lanes each side median separated main Highway. Location ID 40 connects two Mardan/Nowshera with Malakand. Traffic going from Mardan to Malakand is taken as North Bound NB. Traffic going from Malakand to Mardan is taken as South Bound SB. Figure 2.78 shows Location ID 40.



Figure 2-78: Satellite Image of Location ID 40

2.3.14 Location ID 41

Location ID 41 located on Charsadda road. It is 2 lanes each side main carriageway. It connects Peshawar with Charsadda. Traffic going from Peshawar to Charsadda is taken as North Bound NB. Traffic going from Charsadda to Peshawar is taken as South Bound SB. Figure 2.79 shows Location ID 41.



Figure 2-79: Satellite Image of Location ID 41

2.3.15 Location ID 42

Location ID 42 located on Peshawar Toll Plaza on M-1. It connects Peshawar with Islamabad and other major cities along its alignment. Traffic going from Islamabad to Peshawar is taken as North Bound NB. Traffic going from Peshawar towards Islamabad is taken as South Bound SB. Figure 2.80 shows Location ID 42.

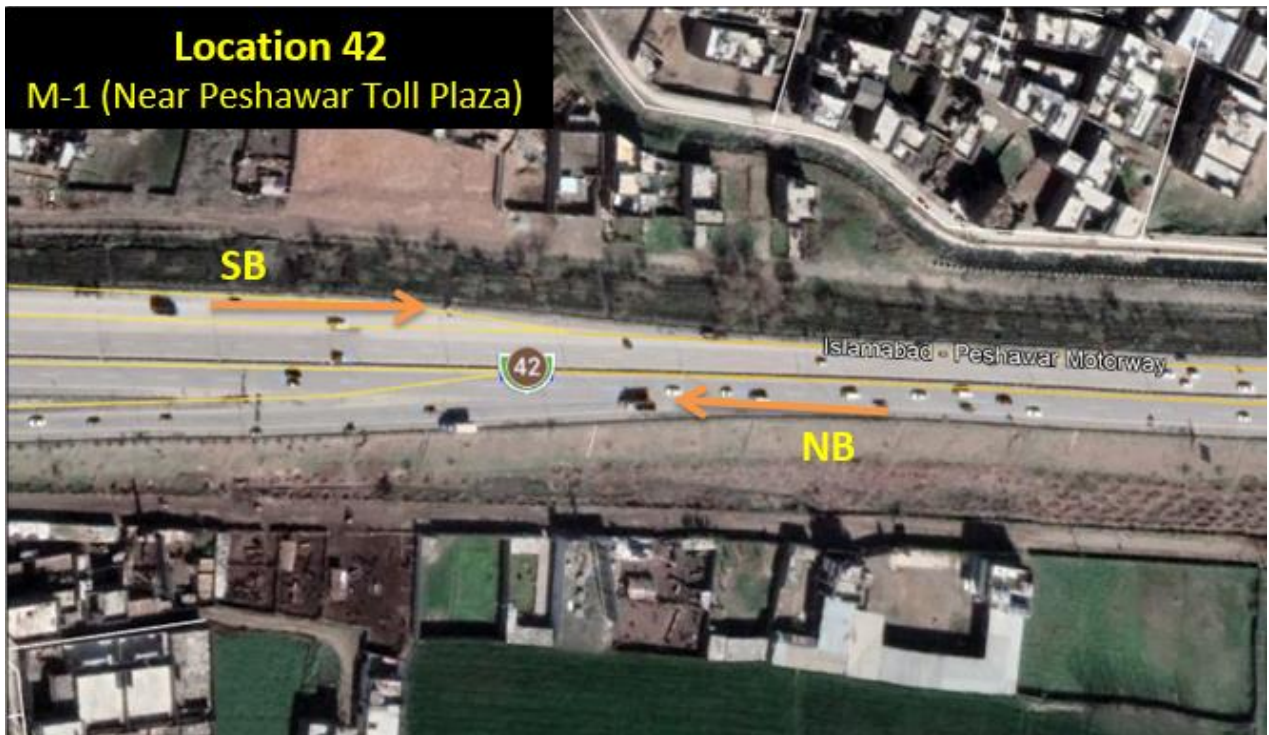


Figure 2-80: Satellite Image of Location ID 42

2.3.16 Location ID 43

Location ID 43 located on N-80 Kohat – Fateh Jang Road near Khushal Garh. It is a 2 lanes each side median separated National Highway. It connects two Kohat with Jhand/Fateh Jang and goes to Rawalpindi. Traffic going from Kohat towards Rawalpind/Jhand is taken as North Bound NB. Traffic going from Jhand towards Kohat is taken as South Bound SB. Figure 2.81 shows Location ID 43.



Figure 2-81: Satellite Image of Location ID 43

2.3.17 Location ID 44

Location ID 44 located on N-55 (Indus Highway) near Dara Adam Khel. It is a 2 lanes each side median separated National Highway. It connects two cities Peshawar and Kohat. Traffic going from Kohat to Peshawar is taken as North Bound NB. Traffic going from Peshawar to Kohat is taken as South Bound SB. Figure 2.82 shows Location ID 44.



Figure 2-82: Satellite Image of Location ID 44

2.3.18 Location ID 45

Location ID 45 located on N-80 (Rawalpindi Road) near Kohat. It is a 2 lanes each side median separated National Highway. It connects two cities Kohat and Rawalpindi. Traffic going from Kohat to Rawalpindi is taken as North Bound NB. Traffic going from Rawalpindi to Kohat is taken as South Bound SB. Figure 2.83 shows Location ID 45.



Figure 2-83: Satellite Image of Location ID 45

2.3.19 Location ID 46

Location ID 46 located in FATA Bajaur Agency on Munda – khar Road. It is 8 to 9 meters single carriageway. It connects Peshawar/Shabqadar with Bajaur Khar and Timergara. Traffic going from Peshawar to Khar/Timergara is taken as North Bound NB. Traffic going from Khar/Timergara to Peshawar/Shabqadar is taken as South Bound SB. Figure 2.84 and shows satellite imagery of Location ID 46.



Figure 2-84: Satellite Image of Location ID 46

2.3.20 Location ID 47

Location ID 47 located in FATA Mohmand Agency on Mohmand Agency Road. It is 6 to 7 meters single carriageway. Location ID 47 connects Peshawar/shabqadar with Mohmand Agency. Traffic going from Peshawar to Mohmand Agency/Khar is taken as North Bound NB. Traffic going from Mohmand Agency/Khar to Peshawar is taken as South Bound SB. Figure 2.85 shows satellite imagery of Location ID 47.



Figure 2-85: Satellite Image of Location ID 47

2.3.21 Location ID 48

Location ID 48 located on Mohmand Agency road near Bab-e-Mohmand. It is 6 to 7m road. Location ID 48 connects Peshawar & Shabqadar with Ghalanai and Bajaur Khar. Traffic going from Peshawar/Shabqadar side towards Ghalanai is taken as North Bound NB. Traffic going from Ghalanai to Peshawar/Shabqadar is taken as South Bound SB. Figure 2.86 shows Location ID 48.



Figure 2-86: Satellite Image of Location ID 48

2.3.22 Location ID 49

Location ID 49 located on N-5 near Torkham (Pak-Afghan Border). It is 2 lanes each side main carriageway. Location ID 49 connects two Peshawar/Landi kotal with Torkham. Traffic going from Peshawar to Torkham is taken as North Bound NB. Traffic going from Torkham to Peshawar is taken as South Bound SB. Figure 2.87 shows Location ID 49.



Figure 2-87: Satellite Image of Location ID 49

2.3.23 Location ID 50

Location ID 50 located on FATA Khyber Agency. It is a 3 to 4m local road. Location ID 50 connects Peshawar and Bara with Tirah. Traffic going from Peshawar to Tirah is taken as North Bound NB. Traffic going from Tirah to Bara/Peshawar is taken as South Bound SB. Figure 2.88 shows satellite imagery of Location ID 50.

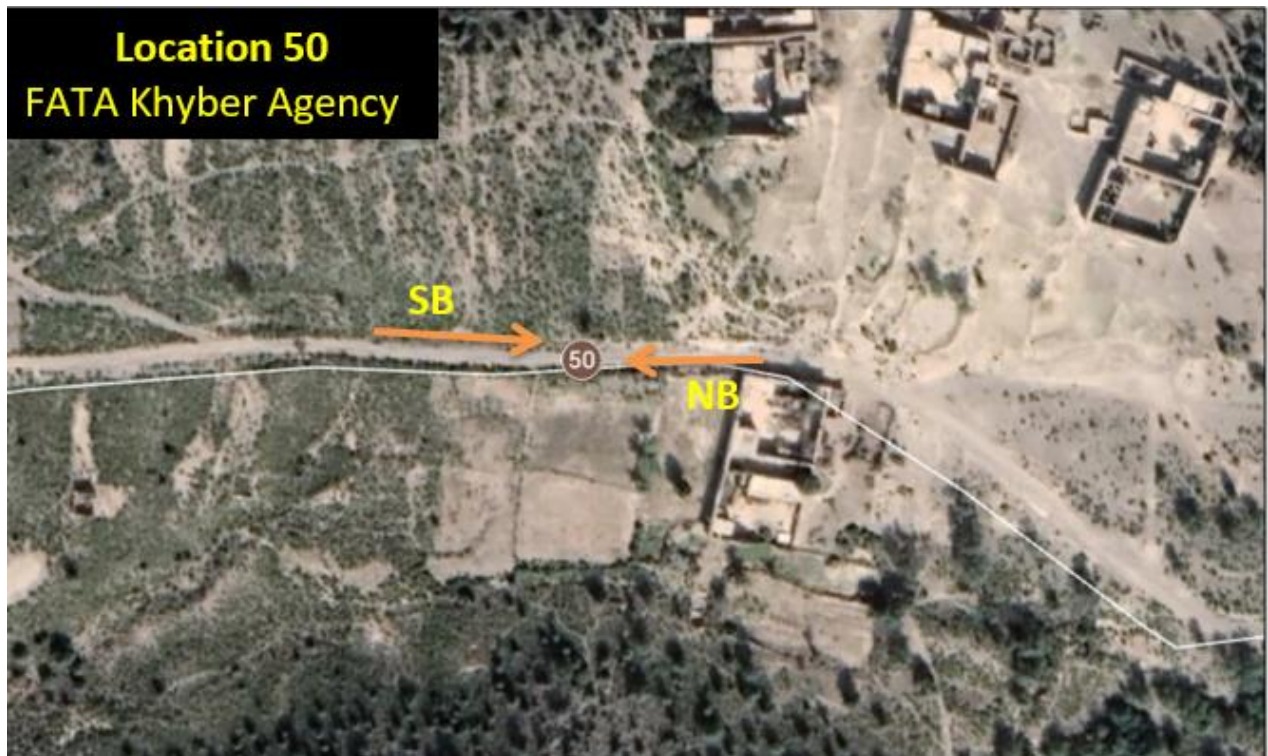


Figure 2-88: Satellite Image of Location ID 50

2.3.24 Location ID 51

Location ID 51 located in FATA on Orakzai Agency Road. It is 7 to 8 meters two lanes single carriageway. It connects Kohat with Kalaya. Traffic going from Kohat towards Kalaya is taken as North Bound NB. Traffic going from Kalaya towards Kohat is taken as South Bound SB. Figure 2.89 shows Satellite imagery of Location ID 51.



Figure 2-89: Satellite Image of Location ID 51

2.3.25 Location ID 52

Location ID 52 located in FATA on Main Parachinar Road near Parachinar. It connects Sadda with Parachinar. Traffic going from Kohat side to Parachinar is taken as North Bound NB. Traffic going from Parachinar to Kohat side is taken as South Bound SB. Figure 2.90 shows satellite imagery of Location ID 52.



Figure 2-90: Satellite Image of Location ID 52

2.3.26 Location ID 53

Location ID 53 located on Thal – Hangu road near Hangu. It is 8 to 9 meters’ single carriageway. Location ID 53 connects Hangu with Thal. Traffic going from Hangu to Thal is taken as North Bound NB. Traffic going from Thal to Hangu is taken as South Bound SB. Figure 2.91 shows satellite imagery Location ID 53.



Figure 2-91: Satellite Image of Location ID 53

2.3.27 Location ID 54

Location ID 54 located on Miran Shah – Bannu Road. Location ID 54 connects Bannu with Miran Shah. Traffic going from Bannu to Miran Shah is taken as North Bound NB. Traffic going from Miran Shah to Bannu is taken as South Bound SB. Figure 2.92 shows Satellite imagery of Location ID 54.

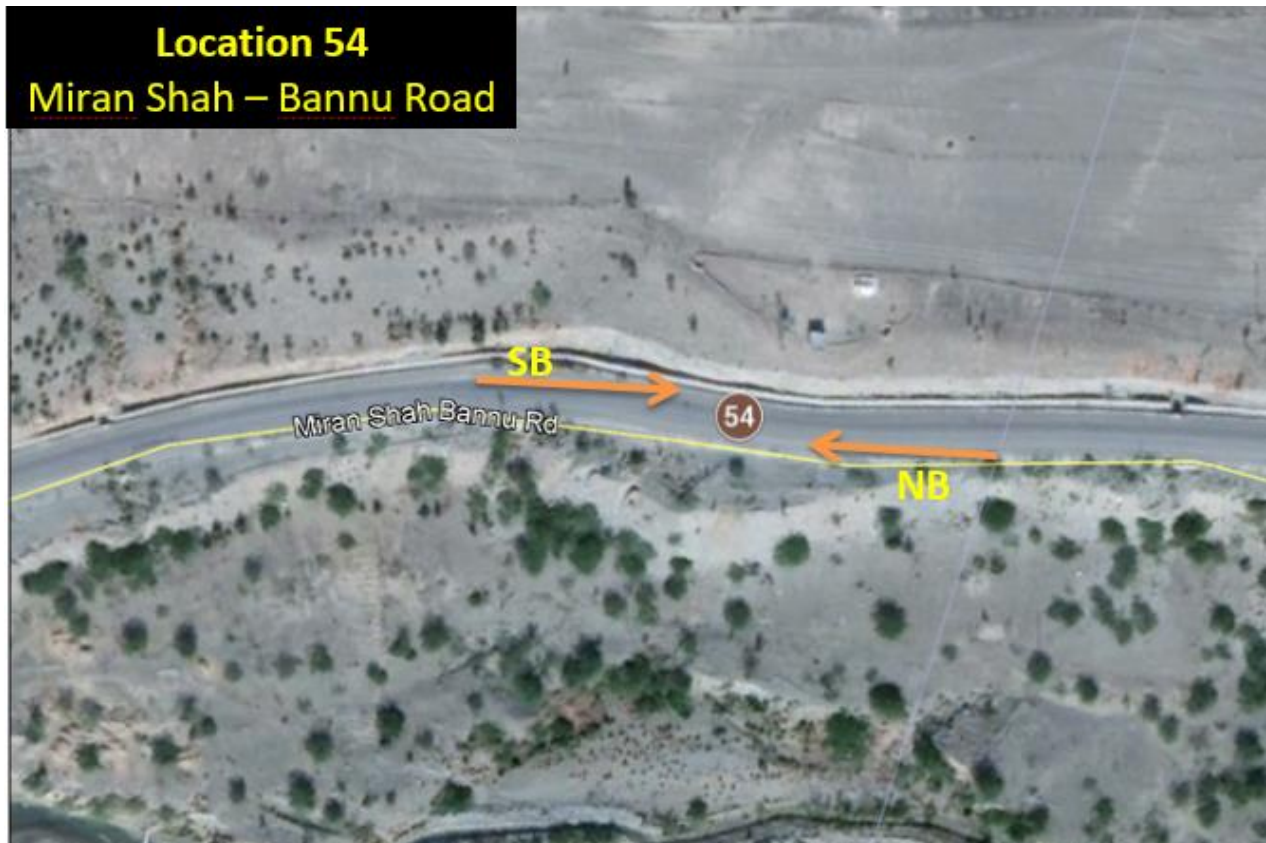


Figure 2-92: Satellite Image of Location ID 54

2.3.28 Location ID 55

Location ID 55 located on Bannu to Sarai Naurang Road (Near Bannu). It is 2 lanes each side median separated main carriageway. Location ID 55 connects Bannu with Sarai Naurang and Gandhi Chowk. Traffic going from Sarai Naurang to Bannu is taken as North Bound NB. Traffic going from Bannu to Sarai Naurang is taken as South Bound SB. Figure 2.93 shows satellite imagery of Location ID 55.



Figure 2-93: Satellite Image of Location ID 55

2.3.29 Location ID 56

Location ID 56 located on N-55 Indus Highway (Near Daulat Tajazai). It is 2 lanes each side median separated National Highway. Location ID 55 connects Daulat Tajazai with Gambila and Gandhi Chowk. Traffic going from Daulat Tajazai to Gambila/Gandi chowk is taken as North Bound NB. Traffic going from Gambila/Gandi Chowk to Daulat Tajazai is taken as South Bound SB. Figure 2.94 shows satellite imagery of Location ID 56.



Figure 2-94: Satellite Image of Location ID 56

2.3.30 Location ID 57

Location ID 57 located on Essa Khel Mianwali Road (Near Daulat Tajazai). It is 7 to 8 meters single carriageway. Location ID 57 connects Daulat Tajazai with Lakki Marwat. Traffic going from Lakki Marwat to Daulat Tajazai/Bannu is taken as North Bound NB. Traffic going from Daulat Tajazai/Bannu to Lakki Marwat is taken as South Bound SB. Figure 2.95 shows satellite imagery of Location ID 57.



Figure 2-95: Satellite Image of Location ID 57

2.3.31 Location ID 58

Location ID 58 located on N-55 Indus Highway (near Ambiri Kala). It is 2 lanes each side median separated National Highway. Location ID 58 connects Bannu with Karak. Traffic going from Bannu to Karak is taken as North Bound NB. Traffic going from Karak to Bannu is taken as South Bound SB. Figure 2.96 shows satellite imagery of Location ID 58.



Figure 2-96: Satellite Image of Location ID 58

2.3.32 Location ID 59

Location ID 59 located on Esha Razmak Road. It is a 5 to 6 meters' road. Location ID 59 connects Razmak with Miran Shah. Traffic going from Razmak to Miran Shah is taken as North Bound NB. Traffic going from Miran Shah to Razmak is taken as South Bound SB. Figure 2.97 shows satellite imagery of Location ID 59.



Figure 2-97: Satellite Image of Location ID 59

2.3.33 Location ID 60

Location ID 60 located on Makin Road (Near Wanna). It is a 5 to 6 meters' single carriageway. Location ID 60 connects Wanna with Makin/Razmak. Traffic going from Sarai Wanna to Makin is taken as North Bound NB. Traffic going from Makin to Wanna is taken as South Bound SB. Figure 2.98 shows satellite imagery of Location ID 60.



Figure 2-98: Satellite Image of Location ID 60

2.3.34 Location ID 61

Location ID 61 located on Zohb – D.I Khan Road. It is 8 to 9 meters National Highway. Location ID 61 connects D.I Khan with Zohb. Traffic going from Zohb to D.I Khan is taken as North Bound NB. Traffic going from D.I Khan to Zohb is taken as South Bound SB. Figure 2.99 shows satellite imagery of Location ID 61.



Figure 2-99: Satellite Image of Location ID 61

2.3.35 Location ID 62

Location ID 62 located on Wana – Angoor Ada Road. It is 6 to 7 meters single carriageway. Location ID 62 connects Wana with Tanaie and Angoor Ada. Traffic going from Wana to Angor Ada is taken as North Bound NB. Traffic going from Angor Ada to Wana is taken as South Bound SB. Figure 2.100 shows satellite imagery of Location ID 62.



Figure 2-100: Satellite Image of Location ID 62

2.3.36 Location ID 63

Location ID 63 located on Tank – D.I Khan Road. It is 7 to 8 meters single carriageway. Location ID 63 connects D.I Khan with Tank. Traffic going from D.I Khan to Tank is taken as North Bound NB. Traffic going from Tank to D.I Khan is taken as South Bound SB. Figure 2.101 shows satellite imagery of Location ID 63.



Figure 2-101: Satellite Image of Location ID 63

2.4 Package – III (Punjab – 1)

Punjab Province is divided into two packages i.e., Package – III and Package – IV. There are 77 locations as identified by client for 24-Hours Traffic counts and O-D Survey for Package –III.

Figure shows all 77 locations of package - III.



Figure 2-102: Satellite Image of Survey Locations Package – III

Survey Location description of Package - III

ID	Location Description	ID	Location Description	ID	Location Description
64	Near Kallar Syedan	82	M-2 Khanqah Dogran Interchange (NB/S...	100	Near Mirpur AJK
65	N-75	83	M-2 Sheikhpura Interchange (NB/SB)	101	Near Bhimber AJK
66	N-80 (Tarnot - Fatehjang)	84	M-2 Kala Shah Kaku Interchange (NB/SB)	102	N-5(Gujar Khan - Dina)
67	Near Kahuta	85	D.I.Khan Road (Darya Khan - D.I.Khan	103	N-5 (Jhelum - Kharian)
68	M-1 Motorway Toll Plaza at Islamabad (...)	86	Near Toba Tek Singh	104	N-5 (Muridke - Lahore)
69	N-5 Near Gujar Khan	87	M-2 Faiz Pure Interchange (NB/SB)	105	Sargodha - Mianwali Road (Mianwali - K...
70	M-2 Chakri Interchange (NB/SB)	88	M2 Zero Point, Lahore	106	Jauharabad - Muzaffargarh Road (Khush...
71	Near Pindi Gheb	89	M-2 Ravi Toll Plaza (NB/SB)	107	Sargodha Faisalabad Road (Sargodha - ...)
72	M-2 Balkasar Interchange (NB/SB)	90	Mianwali -Talagang Road	108	Jhang Bhakkar Road (Bakkar - Atharan H...
73	Mandra - Chakwal Road (Mandra -Chakw...	91	Talagang Road (Talagang - Khusab)	109	Bhal Pheru More Khunda Road (More Kh...
74	M-2 Kallar Kahar Interchange (NB/SB)	92	Kallar Kahar Road (Kallar Kahar - Khusha...	110	N-5 (Pattoki - Okara)
75	M-2 Lilla Interchange (NB/SB)	93	Sargodha Bhalwal Road (Gojra - Bhalwal)	111	Depal Pur Road (Kasur - Hujra Shah Maq...
76	Gojra Toba Road	94	N-5 (Gujrat - Wazirabad)	112	Bhera Malakwal Road (Miani - Bhera)
77	M-2 Bhera Interchange (NB/SB)	95	Lahore Road (Pindi Bhattian - Chiniot)	113	Sargodha Road (Shahpur -Khushab)
78	M-2 Salem Interchange (NB/SB)	96	Lahore -Sheikhpura-Faisalabad Road (S...	114	Sargodha - Jhang Road (Sargodha - Jha...
79	M-2 Makhdoom Interchange (NB/SB)	97	Faisalabad Road (Lahore - Jaranwala)	115	Sargodha Road (Sargodha - Pindi Bhatti...
80	M-2 Sukheki Interchange (NB/SB)	98	Okara Faisalabad Road (Okara -Samundri)	116	Lahore Sargodha Road (Sheikhpura - L...
81	Jhang Faisalabad Road	99	Near Mangla	117	Faisalabad Road (Jaranwala - Okara)

ID	Location Description	ID	Location Description
118	M-3 Pindibhatian Interchange (NB/SB)	135	Near Bhakkar
119	M-3 Faisalabad Toll Plaza (NB/SB)	136	Near Hafizabad
120	M-4 Gojra Interchange (NB/SB)	137	Near Shorkot
121	Pak-India Border (Wagah)	138	Chiniot Road Near Jhang
122	Near Mandi Bahauddin	139	Okara Faisalabad Road
123	N-5 Near Gujranwala	140	N-5 Near Okara
124	Sialkot Road Near Sambrial		
125	Daska Road Near Sialkot		
126	Pasrur Road Near Sialkot		
127	Gujranwala Road Near Daska		
128	Pasrur Road Near Daska		
129	Pasrur Road Near Narowal		
130	Near Shakar Garh		
131	Narowal Shakargarh Road		
132	Near Narang Mandi		
133	Near Kala Khatie		
134	Near Mianwali		

Figure 2-103: Description of Survey Locations Package – III

2.4.1 Location ID 64

ID 64 is located on Kallar Syedan ~ Rawat Road which is a 4 lane road, with width of each lane being 3.6 meters. The road connects Rawat with Kallar Syedan. Traffic going from Kallar Syedan to Rawat is taken as North Bound whereas traffic going from Rawat to Kallar Syedan is taken as South Bound. Figure Shows the satellite imagery of Location ID 64.

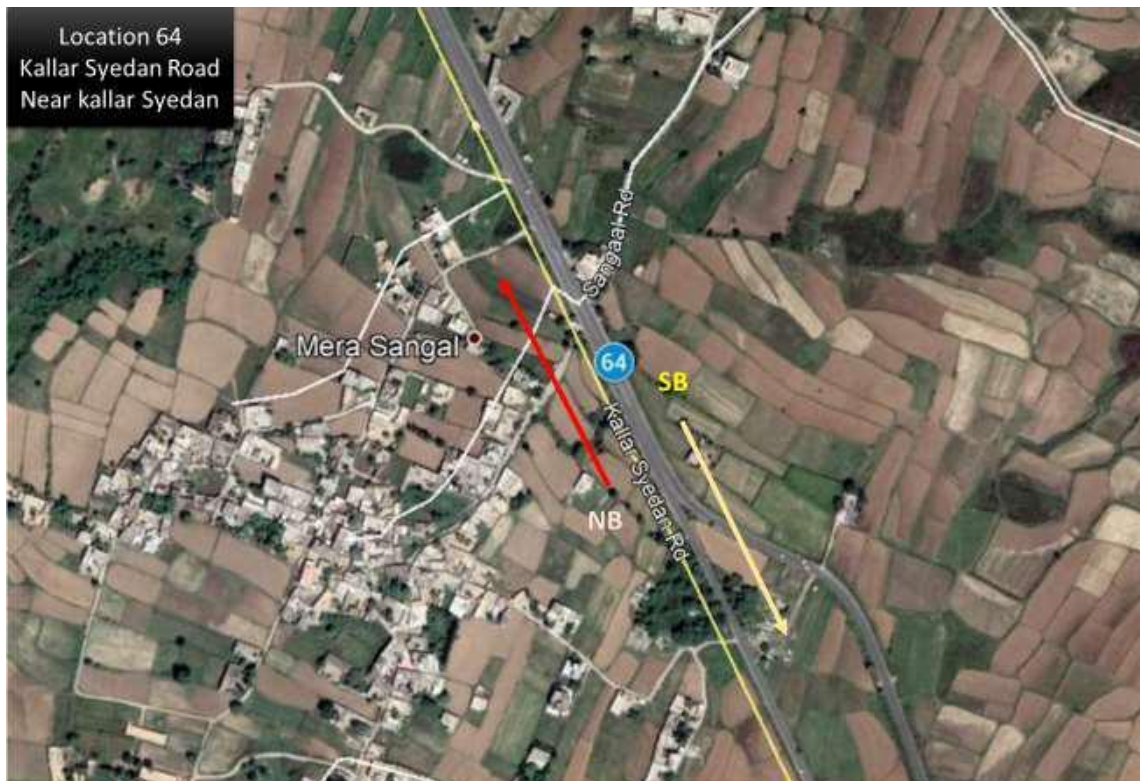


Figure 2-104: Satellite Imagery of Location ID 64

2.4.2 Location ID 65

ID 65 is located on Islamabad ~ Murree Expressway at Phulgran Toll Plaza. It is a 4 lane divided highway with width of each lane being 3.6 meters. It connects Islamabad with Murree. Traffic from Islamabad to Murree is taken as North Bound whereas Traffic from Murree to Islamabad is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-105: Satellite Imagery of Location ID 65

2.4.3 Location ID 66

ID 66 is located on N-80 (Rawalpindi ~ Kohat Highway) at Qutbal Toll Plaza. It is a 2 lane highway with width of each lane being 3.6 meters. It connects Islamabad / Rawalpindi with Fatehjang / Kohat. Traffic from fatehjang to Islamabad is taken as North Bound whereas Traffic from Islamabad to Fatehjang is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-106: Satellite Imagery of Location ID 66

2.4.4 Location ID 67

ID 67 is located on Kahuta Road near kahuta. It is a 2 lane highway with width of each lane being 3.6 meters. It is an integral connection to Kahuta. Traffic from Kakpull to Kahuta is taken as North Bound whereas Traffic from Kakpull to Kahuta is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-107: Satellite Imagery of Location ID 67

2.4.5 Location ID 68

ID 68 is located on Islamabad ~ Peshawar Motorway M-1 at Islamabad toll Plaza. It is a 6 lane Motorway with width of each lane being 3.6 meters. It connects Peshawar with rest of Pakistan. Traffic from Islamabad to Peshawar is taken as North Bound whereas Traffic from Peshawar to Islamabad is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-108: Satellite Imagery of Location ID 68

2.4.6 Location ID 69

ID 69 is located on N-5 near Gujar Khan. It is a 4 lane Highway with width of each lane being 3.6 meters. It connects Peshawar with rest of Pakistan. Traffic from Lahore to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lahore is taken as South Bound. The satellite imagery is shown in figure.

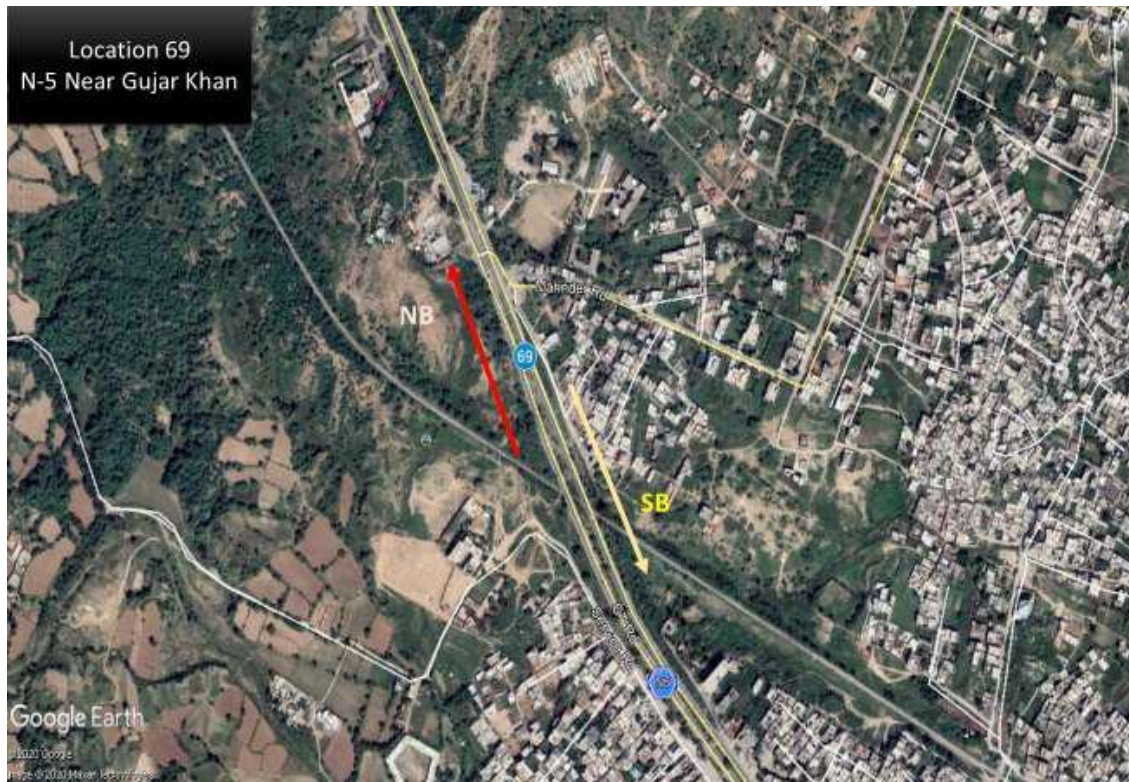


Figure 2-109: Satellite Imagery of Location ID 69

2.4.7 Location ID 70

ID 70 is located on Islamabad ~ Lahore Motorway M-2 at Chakri Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Chakri is taken as North Bound whereas Traffic from Chakri to Lahore is taken as South Bound. For Loop-2, Traffic from Chakri to Islamabad is taken as North Bound whereas Traffic from Islamabad to Chakri is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-110: Satellite Imagery of Location ID 70

2.4.8 Location ID 71

ID 71 is located on Pindigheb ~ Attock Road near Pindigheb. It is a 2 lane Highway with width of each lane being 3.3 meters. Traffic from Talagang to Dhuliyān is taken as North Bound whereas Traffic from Dhuliyān to Talagang is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-111: Satellite Imagery of Location ID 71

2.4.9 Location ID 72

ID 72 is located on Islamabad ~ Lahore Motorway M-2 at Balkasar Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Balkasar is taken as North Bound whereas Traffic from Balkasar to Lahore is taken as South Bound. For Loop-2, Traffic from Balkasar to Islamabad is taken as North Bound whereas Traffic from Islamabad to Balkasar is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-112: Satellite Imagery of Location ID 72

2.4.10 Location ID 73

ID 73 is located on Mandra ~ Chakwal Road near Chakwal. It is a 4 lane divided Highway with width of each lane being 3.3 meters. Traffic from Chakwal to Mandra is taken as North Bound whereas Traffic from Mandra to Chakwal is taken as South Bound. The satellite imagery is shown in figure.

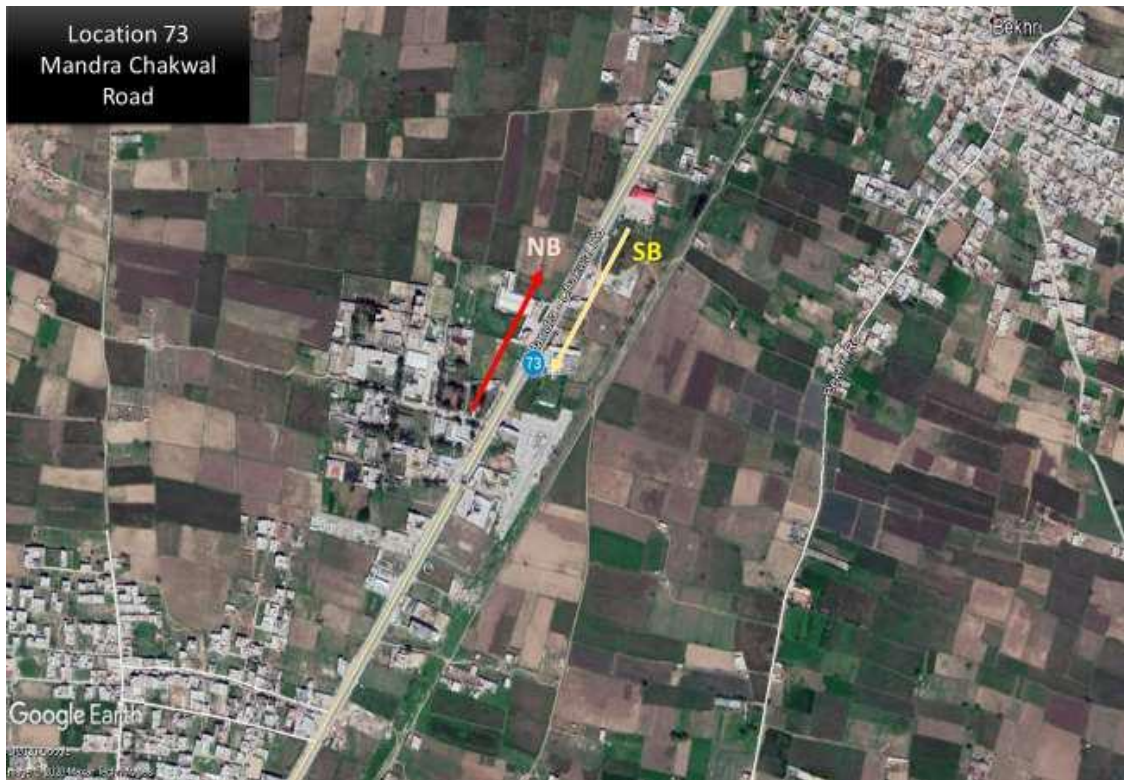


Figure 2-113: Satellite Imagery of Location ID 73

2.4.11 Location ID 74

ID 74 is located on Islamabad ~ Lahore Motorway M-2 at Kallar Kahar Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Kallar Kahar is taken as North Bound whereas Traffic from Kallar Kahar to Lahore is taken as South Bound. For Loop-2, Traffic from Kallar Kahar to Islamabad is taken as North Bound whereas Traffic from Islamabad to Kallar Kahar is taken as South Bound. The satellite imagery is shown in figure.

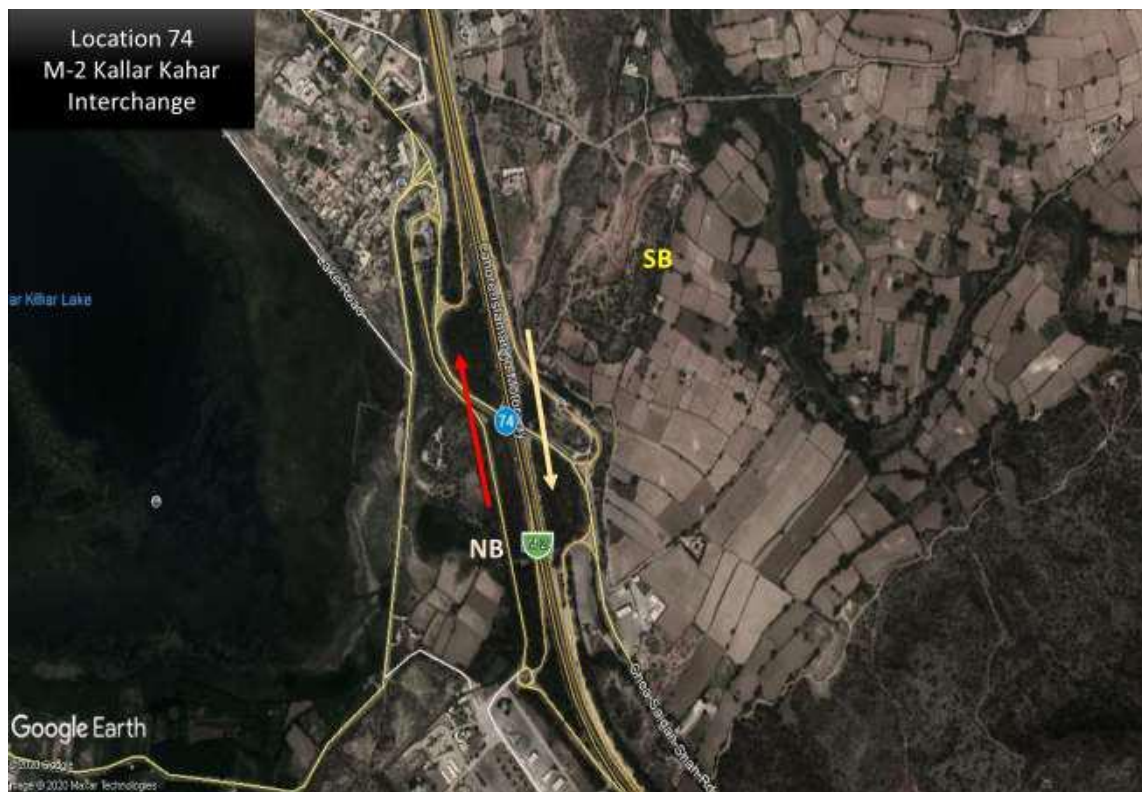


Figure 2-114: Satellite Imagery of Location ID 74

2.4.12 Location ID 75

ID 75 is located on Islamabad ~ Lahore Motorway M-2 at Lilla Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Lilla is taken as North Bound whereas Traffic from Lilla to Lahore is taken as South Bound. For Loop-2, Traffic from Lilla to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lilla is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-115: Satellite Imagery of Location ID 75

2.4.13 Location ID 76

ID 76 is located on Gojra ~Toba Tek Singh Road. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Toba Tek Singh to Gojra is taken as North Bound whereas Traffic from Gojra to Toba Tek Singh is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-116: Satellite Imagery of Location ID 76

2.4.14 Location ID 77

ID 77 is located on Islamabad ~ Lahore Motorway M-2 at Bhera Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Bhera is taken as North Bound whereas Traffic from Bhera to Lahore is taken as South Bound. For Loop-2, Traffic from Bhera to Islamabad is taken as North Bound whereas Traffic from Islamabad to Bhera is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-117: Satellite Imagery of Location ID 77

2.4.15 Location ID 78

ID 78 is located on Islamabad ~ Lahore Motorway M-2 at Salam Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Salam is taken as North Bound whereas Traffic from Salam to Lahore is taken as South Bound. For Loop-2, Traffic from Salam to Islamabad is taken as North Bound whereas Traffic from Islamabad to Salam is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-118: Satellite Imagery of Location ID 78

2.4.16 Location ID 79

ID 79 is located on Islamabad ~ Lahore Motorway M-2 at Makhdoom Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Makhdoom is taken as North Bound whereas Traffic from Makhdoom to Lahore is taken as South Bound. For Loop-2, Traffic from Makhdoom to Islamabad is taken as North Bound whereas Traffic from Islamabad to Makhdoom is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-119: Satellite Imagery of Location ID 79

2.4.17 Location ID 80

ID 80 is located on Islamabad ~ Lahore Motorway M-2 at Sukheke Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Sukheke is taken as North Bound whereas Traffic from Sukheke to Lahore is taken as South Bound. For Loop-2, Traffic from Sukheke to Islamabad is taken as North Bound whereas Traffic from Islamabad to Sukheke is taken as South Bound. The satellite imagery is shown in figure.

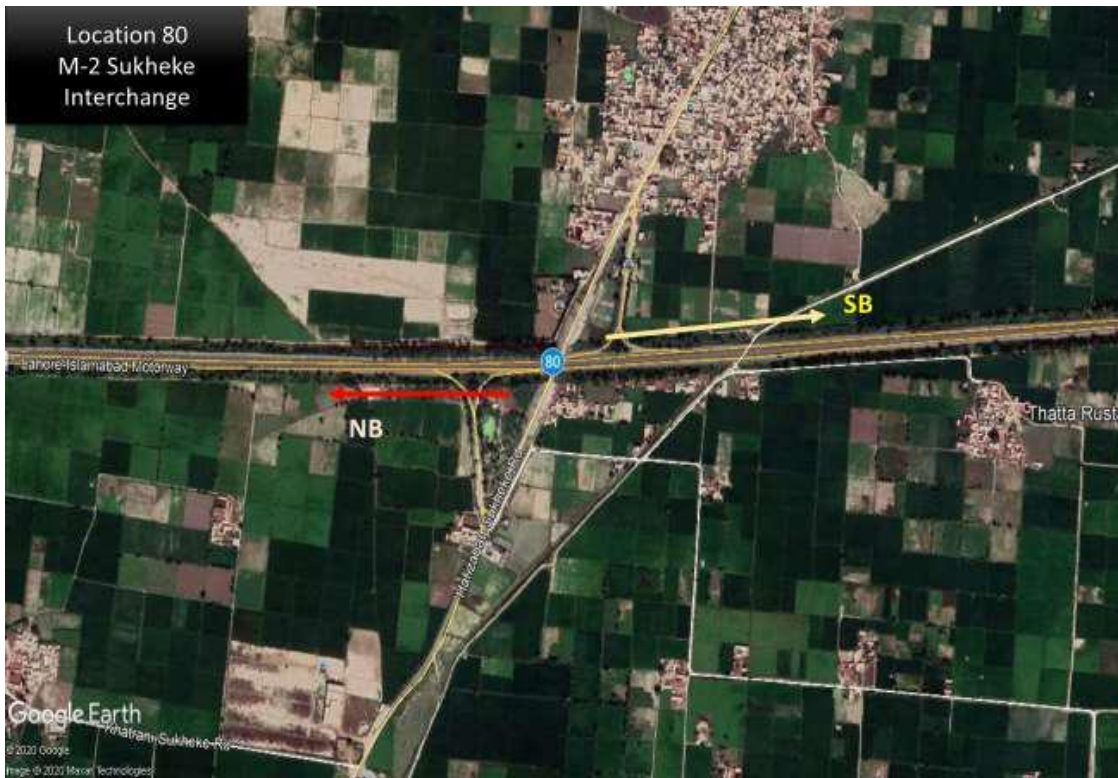


Figure 2-120: Satellite Imagery of Location ID 80

2.4.18 Location ID 81

ID 81 is located on Jhang ~ Faisalabad Road. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Jhang to Faisalabad is taken as North Bound whereas Traffic from Faisalabad to Jhang is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-121: Satellite Imagery of Location ID 81

2.4.19 Location ID 82

ID 82 is located on Islamabad ~ Lahore Motorway M-2 at Khanqah Dogran Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Khanqah Dogran is taken as North Bound whereas Traffic from Khanqah Dogran to Lahore is taken as South Bound. For Loop-2, Traffic from Khanqah Dogran to Islamabad is taken as North Bound whereas Traffic from Islamabad to Khanqah Dogran is taken as South Bound. The satellite imagery is shown in figure.

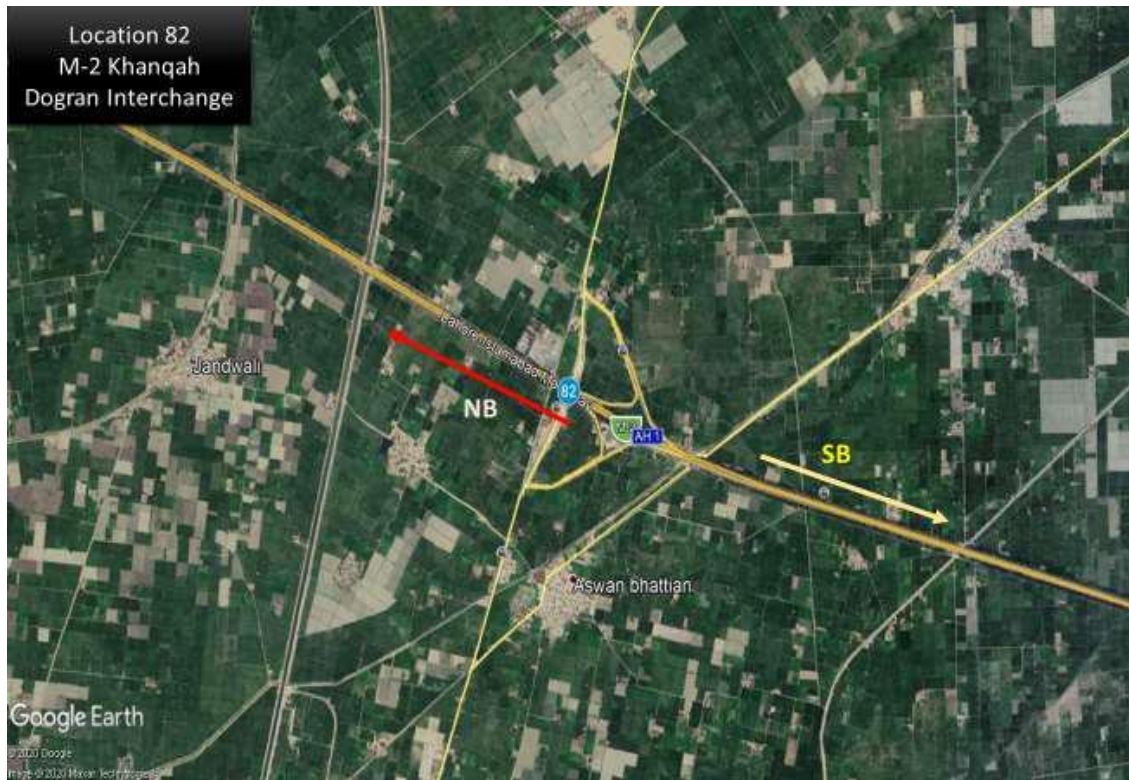


Figure 2-122: Satellite Imagery of Location ID 82

2.4.20 Location ID 83

ID 83 is located on Islamabad ~ Lahore Motorway M-2 at Sheikhpura Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Sheikhpura is taken as North Bound whereas Traffic from Sheikhpura to Lahore is taken as South Bound. For Loop-2, Traffic from Sheikhpura to Islamabad is taken as North Bound whereas Traffic from Islamabad to Sheikhpura is taken as South Bound. The satellite imagery is shown in figure.

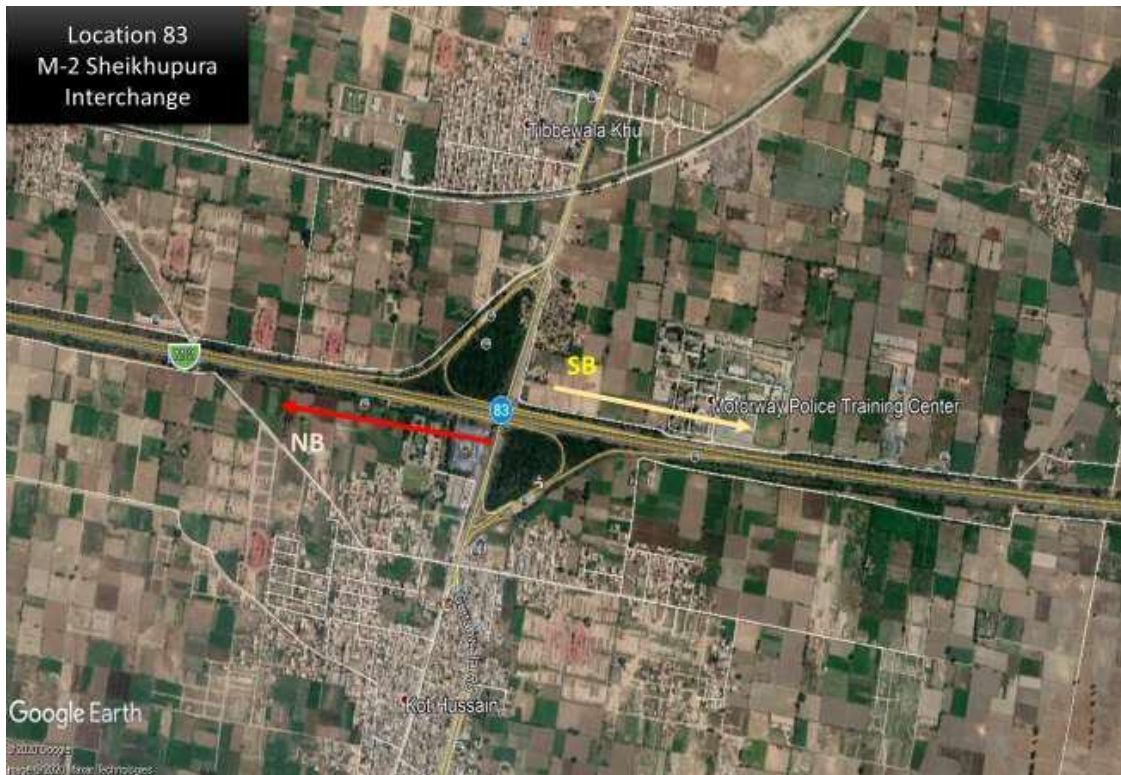


Figure 2-123: Satellite Imagery of Location ID 83

2.4.21 Location ID 84

ID 84 is located on Islamabad ~ Lahore Motorway M-2 at Kala Shah Kaku Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Kala Shah Kaku is taken as North Bound whereas Traffic from Kala Shah Kaku to Lahore is taken as South Bound. For Loop-2, Traffic from Kala Shah Kaku to Islamabad is taken as North Bound whereas Traffic from Islamabad to Kala Shah Kaku is taken as South Bound. The satellite imagery is shown in figure.

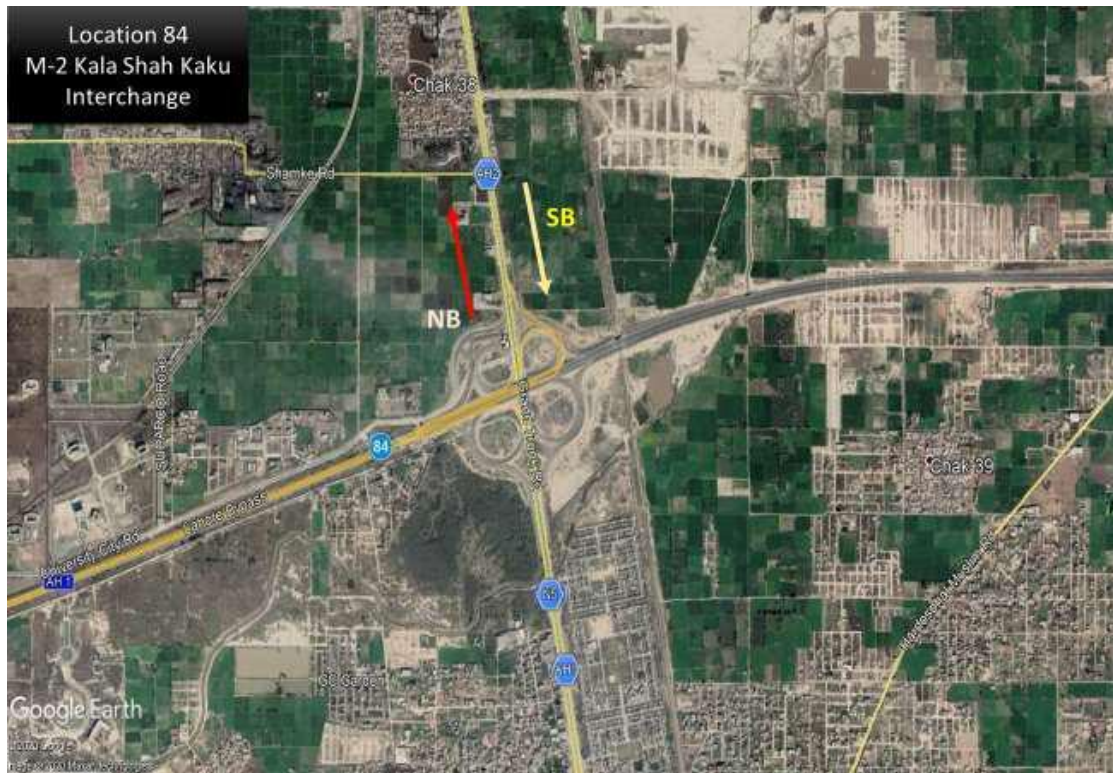


Figure 2-124: Satellite Imagery of Location ID 84

2.4.22 Location ID 85

ID 85 is located on Dera Ismail Khan Road near Kotla Jam. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Kotla Jam to D.I. Khan is taken as North Bound whereas Traffic from D.I. Khan to Kotla Jam is taken as South Bound. The satellite imagery is shown in figure.

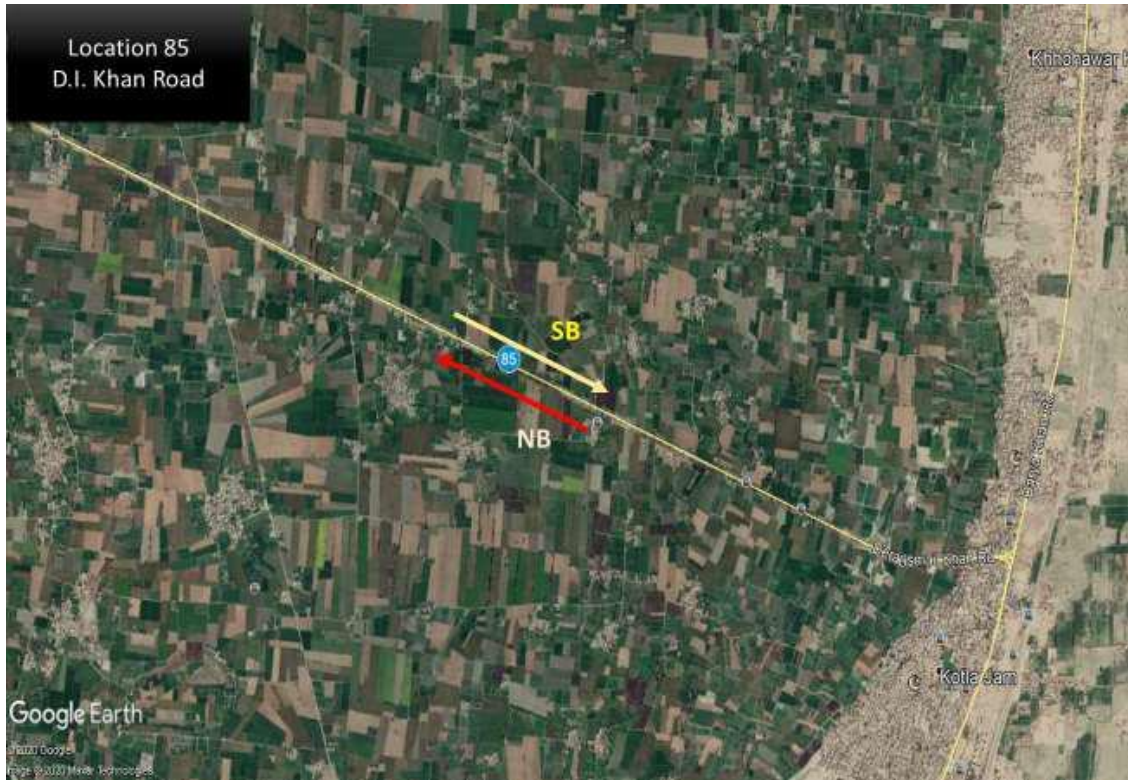


Figure 2-125: Satellite Imagery of Location ID 85

2.4.23 Location ID 86

ID 86 is located on Jhang ~ Toba Tek Singh Road near Toba Tek Singh. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Shorkot to Toba Tek Singh is taken as North Bound whereas Traffic from Toba Tek Singh to Shorkot is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-126: Satellite Imagery of Location ID 86

2.4.24 Location ID 87

ID 87 is located on Islamabad ~ Lahore Motorway M-2 at Faiz Pur Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Faiz Pur is taken as North Bound whereas Traffic from Faiz Pur to Lahore is taken as South Bound. For Loop-2, Traffic from Faiz Pur to Islamabad is taken as North Bound whereas Traffic from Islamabad to Faiz Pur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-127: Satellite Imagery of Location ID 87

2.4.25 Location ID 88

ID 88 is located on Islamabad ~ Lahore Motorway M-2 at Zero Point Interchange. Traffic from Multan to Lahore is taken as North Bound whereas Traffic from Lahore to Multan is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-128: Satellite Imagery of Location ID 88

2.4.26 Location ID 89

ID 89 is located on Islamabad ~ Lahore Motorway M-2 at Ravi Toll Plaza. Traffic from Lahore to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lahore is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-129: Satellite Imagery of Location ID 89

2.4.27 Location ID 90

ID 90 is located on Mianwali ~ Talang Road near talang. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Mianwali to talang is taken as North Bound whereas Traffic from Talang to Mianwali is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-130: Satellite Imagery of Location ID 90

2.4.28 Location ID 91

ID 91 is located on Sargodha Road near talagang. It is a 2 lane Highway with width of each lane being 3.3 meters. Traffic from Khushab to talagang is taken as North Bound whereas Traffic from Talagang to Khushab is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-131: Satellite Imagery of Location ID 91

2.4.29 Location ID 92

ID 92 is located on Kallar Kahar Road near Pail. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Khushab to Kallar Kahar is taken as North Bound whereas Traffic from Kallar Kahar to Khushab is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-132: Satellite Imagery of Location ID 92

2.4.30 Location ID 93

ID 93 is located on Sargodha ~ Bhalwal Road near Sargodha. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Sargodha to Bhalwal is taken as North Bound whereas Traffic from Bhalwal to Sargodha is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-133: Satellite Imagery of Location ID 93

2.4.31 Location ID 94

ID 94 is located on N-5 near Gujrat. It is a 4 lane divided Highway with width of each lane being 3.6 meters. Traffic from Lahore to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lahore is taken as South Bound. The satellite imagery is shown in figure.

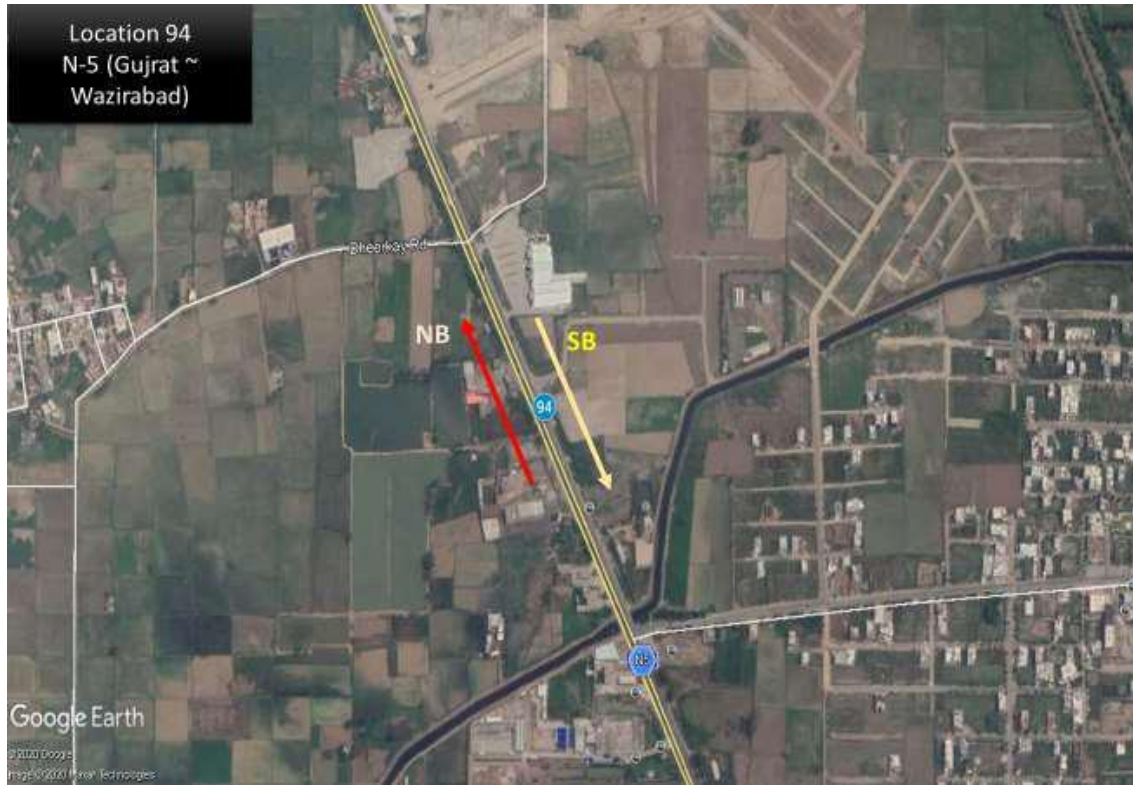


Figure 2-134: Satellite Imagery of Location ID 94

2.4.32 Location ID 95

ID 95 is located on Lahore Road near Chiniot. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Chiniot to Pindi Bhattian is taken as North Bound whereas Traffic from Pindi Bhattian to Chiniot is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-135: Satellite Imagery of Location ID 95

2.4.33 Location ID 96

ID 96 is located on Sheikhupura ~ Faisalabad Road near Faisalabad. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Faisalabad to Sheikhupura is taken as North Bound whereas Traffic from Sheikhupura to Faisalabad is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-136: Satellite Imagery of Location ID 96

2.4.34 Location ID 97

ID 97 is located on Faisalabad Road connecting Juranwala to Faisalabad. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Juranwala to Faisalabad is taken as North Bound whereas Traffic from Faisalabad to Juranwala is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-137: Satellite Imagery of Location ID 97

2.4.35 Location ID 98

ID 98 is located on Okara ~ Faisalabad Road near Jhok Jalla. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Okara to Samundri is taken as North Bound whereas Traffic from Samundri to Okara is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-138: Satellite Imagery of Location ID 98

2.4.36 Location ID 99

ID 99 is located on Dina ~ Mirpur Road near Mangla. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Dina to Mirpur is taken as North Bound whereas Traffic from Mirpur to Dina is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-139: Satellite Imagery of Location ID 99

2.4.37 Location ID 100

ID 100 is located on Mangla Road near Mirpur AJK. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Mirpur to Kotli is taken as North Bound whereas Traffic from Kotli to Mirpur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-140: Satellite Imagery of Location ID 100

2.4.38 Location ID 101

ID 101 is located on Gujrat Road near Bhimber. It is a 2-lane Highway with width of each lane being 3.3 meters. Traffic from Gujrat to Bhimber is taken as North Bound whereas Traffic from Bhimber to Gujrat is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-141: Satellite Imagery of Location ID 101

2.4.39 Location ID 102

ID 102 is located on N-5 near Dina. It is a 4-lane Divided Highway with width of each lane being 3.6 meters. Traffic from Lahore to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lahore is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-142: Satellite Imagery of Location ID 102

2.4.40 Location ID 103

ID 103 is located on N-5 near Kharian. It is a 4-lane Divided Highway with width of each lane being 3.6 meters. Traffic from Lahore to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lahore is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-143: Satellite Imagery of Location ID 103

2.4.41 Location ID 104

ID 104 is located on N-5 near Muridke. It is a 4-lane Divided Highway with width of each lane being 3.6 meters. Traffic from Lahore to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lahore is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-144: Satellite Imagery of Location ID 104

2.4.42 Location ID 105

ID 105 is located on Sargodha ~ Mianwali Road near Khushab. It is a 2-lane Highway with width of each lane being 3.3 meters. Traffic from Khushab to Mianwali is taken as North Bound whereas Traffic from Mianwali to Khushab is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-145: Satellite Imagery of Location ID 105

2.4.43 Location ID 106

ID 106 is located on Jauharabad ~ Muzaffargarh Road near Athari Hazari. It is a 2-lane Highway with width of each lane being 3.3 meters. Traffic from Muzaffargarh to Khushab is taken as North Bound whereas Traffic from Khushab to Muzaffargarh is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-146: Satellite Imagery of Location ID 106

2.4.44 Location ID 107

ID 107 is located on Faisalabad Road near Chiniot. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Chiniot to Sargodha is taken as North Bound whereas Traffic from Sargodha to Chiniot is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-147: Satellite Imagery of Location ID 107

2.4.45 Location ID 108

ID 108 is located on Bhakkar ~ Jhang road near Athara Hazari. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Athara Hazari to Mankera is taken as North Bound whereas Traffic from Mankera to Athara Hazari is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-148: Satellite Imagery of Location ID 108

2.4.46 Location ID 109

ID 109 is located on Bhai Pheru ~More Khunda Road near More Khunda. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Bhai Pheru to More Khunda is taken as North Bound whereas Traffic from More Khunda to Bhai Pheru is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-149: Satellite Imagery of Location ID 109

2.4.47 Location ID 110

ID 110 is located on N-5 near Pattoki. It is a 4-lane Divided Highway with width of each lane being 3.6 meters. Traffic from Multan to Lahore is taken as North Bound whereas Traffic from Lahore to Multan is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-150: Satellite Imagery of Location ID 110

2.4.48 Location ID 111

ID 111 is located on Depal Pur Road near Naqinagar. It is a 4-lane Divided Highway with width of each lane being 3.6 meters. Traffic from Depalpur to Kasur is taken as North Bound whereas Traffic from Kasur to Depalpur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-151: Satellite Imagery of Location ID 111

2.4.49 Location ID 112

ID 112 is located on Bhera ~ Malakwal road near Bhera. It is a 2-lane Highway with width of each lane being 3.3 meters. Traffic from Bhera to Malakwal is taken as North Bound whereas Traffic from Malakwal to Bhera is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-152: Satellite Imagery of Location ID 112

2.4.50 Location ID 113

ID 113 is located on Sargodha road near Shahpur. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Shahpur to Khushab is taken as North Bound whereas Traffic from Khushab to Shahpur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-153: Satellite Imagery of Location ID 113

2.4.51 Location ID 114

ID 114 is located on Jhang ~ Sargodha Road near Jhang. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Jhang to Sargodha is taken as North Bound whereas Traffic from Sargodha to Jhang is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-154: Satellite Imagery of Location ID 114

2.4.52 Location ID 115

ID 115 is located on Lahore ~ Sargodha Road near Sargodha. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Pindi Bhattian to Sargodha is taken as North Bound whereas Traffic from Sargodha to Pindi Bhattian is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-155: Satellite Imagery of Location ID 115

2.4.53 Location ID 116

ID 116 is located on Lahore ~ Sheikhupura Road near Sheikhupura. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Lahore to Sheikhupura is taken as North Bound whereas Traffic from Sheikhupura to Lahore is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-156: Satellite Imagery of Location ID 116

2.4.54 Location ID 117

ID 117 is located on Faisalabad Road near Tandiawala. It is a 2-lane Highway with width of each lane being 3.3 meters. Traffic from Okara to Jaranwala is taken as North Bound whereas Traffic from Jaranwala to Okara is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-157: Satellite Imagery of Location ID 117

2.4.55 Location ID 118

ID 118 is located on Islamabad ~ Lahore Motorway M-2 at Pindi Bhattian Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Lahore to Pindi Bhattian is taken as North Bound whereas Traffic from Pindi Bhattian to Lahore is taken as South Bound. For Loop-2, Traffic from Pindi Bhattian to Islamabad is taken as North Bound whereas Traffic from Islamabad to Pindi Bhattian is taken as South Bound. The satellite imagery is shown in figure.

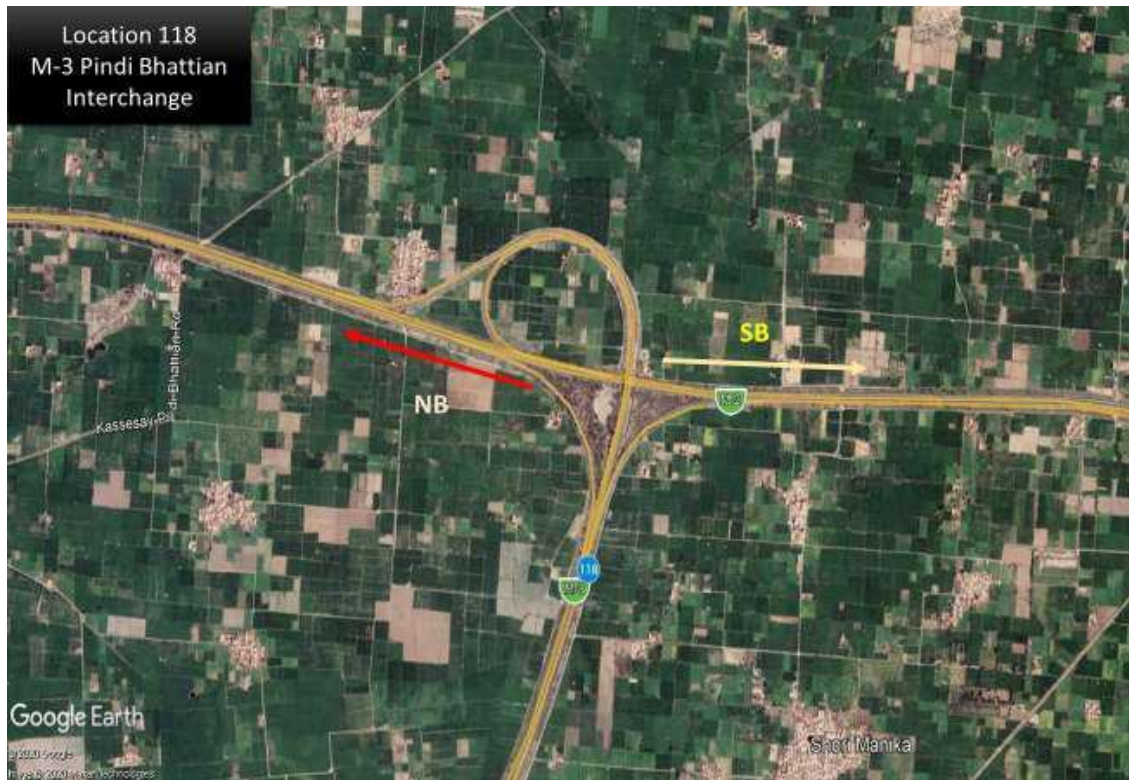


Figure 2-158: Satellite Imagery of Location ID 118

2.4.56 Location ID 119

ID 119 is located on Lahore ~ Faisalabad Motorway M-3 at Faisalabad Toll Plaza. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Multan to Faisalabad is taken as North Bound whereas Traffic from Faisalabad to Multan is taken as South Bound. For Loop-2, Traffic from Faisalabad to Lahore is taken as North Bound whereas Traffic from Lahore to Faisalabad is taken as South Bound. The satellite imagery is shown in figure.

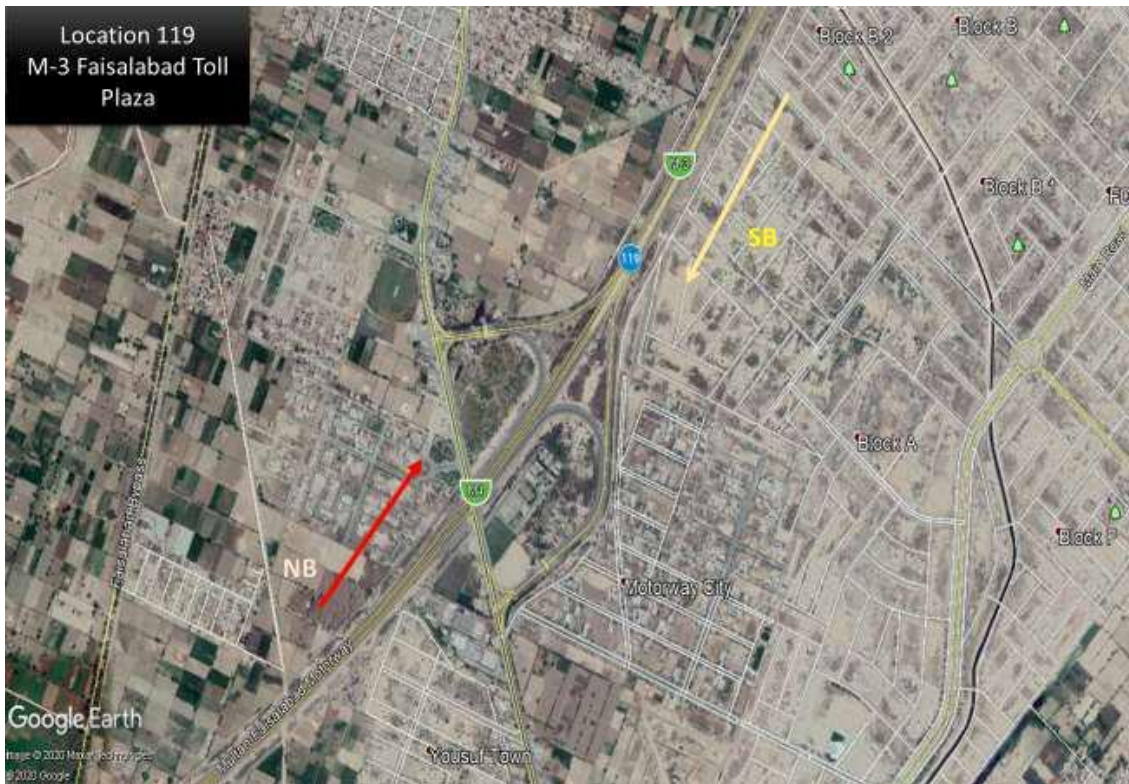


Figure 2-159: Satellite Imagery of Location ID 119

2.4.57 Location ID 120

ID 120 is located on Faisalabad ~ Multan Motorway M-4 at Gojra Interchange. Traffic Counts and OD Survey was carried out on all ramps and loops of the interchange. For Loop-1, Traffic from Gojra to Faisalabad is taken as North Bound whereas Traffic from Faisalabad to Gojra is taken as South Bound. For Loop-2, Traffic from Toba tek Singh to Gojra is taken as North Bound whereas Traffic from Gojra to Toba tek Singh is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-160: Satellite Imagery of Location ID 120

2.4.58 Location ID 121

ID 121 is located on Grand Truck Road near Wagah Border. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Batapur to Wagah is taken as North Bound whereas Traffic from Wagah to Batapur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-161: Satellite Imagery of Location ID 121

2.4.59 Location ID 122

ID 122 is located on Mandi Bahaudin ~ Kharian Road near Mandi Bahaudin. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Bhalwal to Kharian is taken as North Bound whereas Traffic from Kharian to Bhalwal is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-162: Satellite Imagery of Location ID 122

2.4.60 Location ID 123

ID 123 is located on N-5 near Gujranwala. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Lahore to Islamabad is taken as North Bound whereas Traffic from Islamabad to Lahore is taken as South Bound. The satellite imagery is shown in figure.

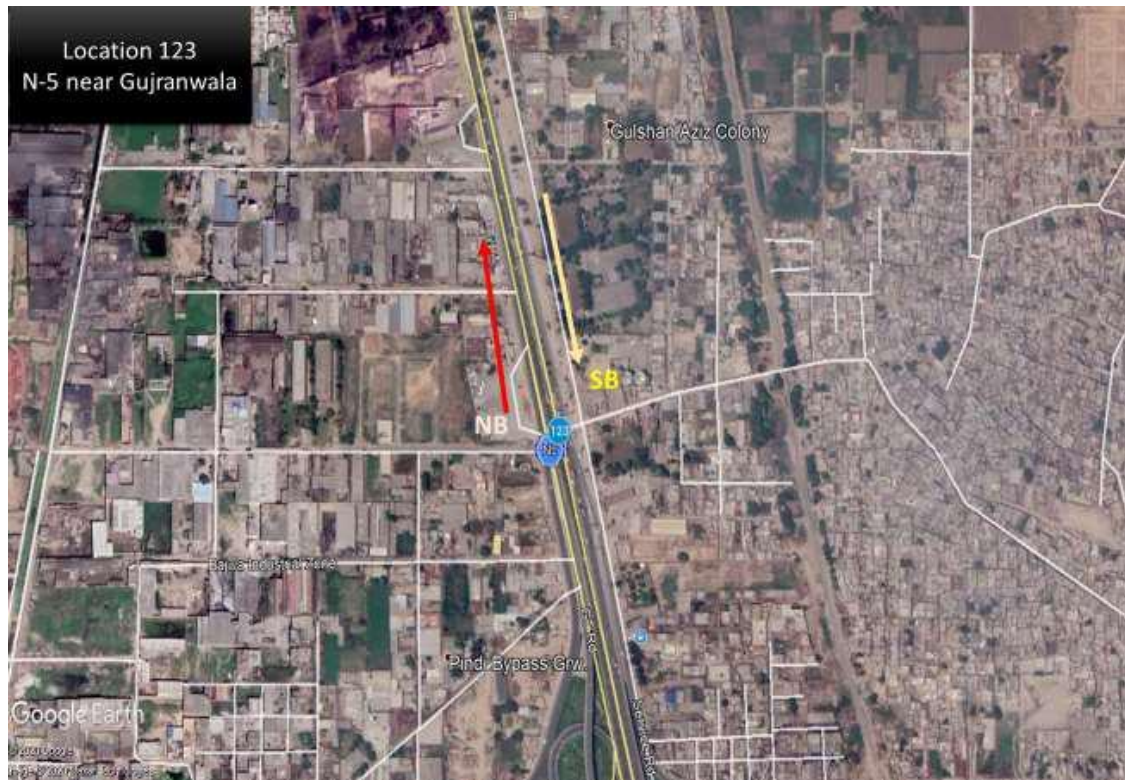


Figure 2-163: Satellite Imagery of Location ID 123

2.4.61 Location ID 124

ID 124 is located on Sialkot Road near Sambrial. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Waziabad to Sambrial is taken as North Bound whereas Traffic from Sambrial to Wazirabad is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-164: Satellite Imagery of Location ID 124

2.4.62 Location ID 125

ID 125 is located on Daska Road near Sialkot. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Daska to Sialkot is taken as North Bound whereas Traffic from Sialkot to Daska is taken as South Bound. The satellite imagery is shown in figure.

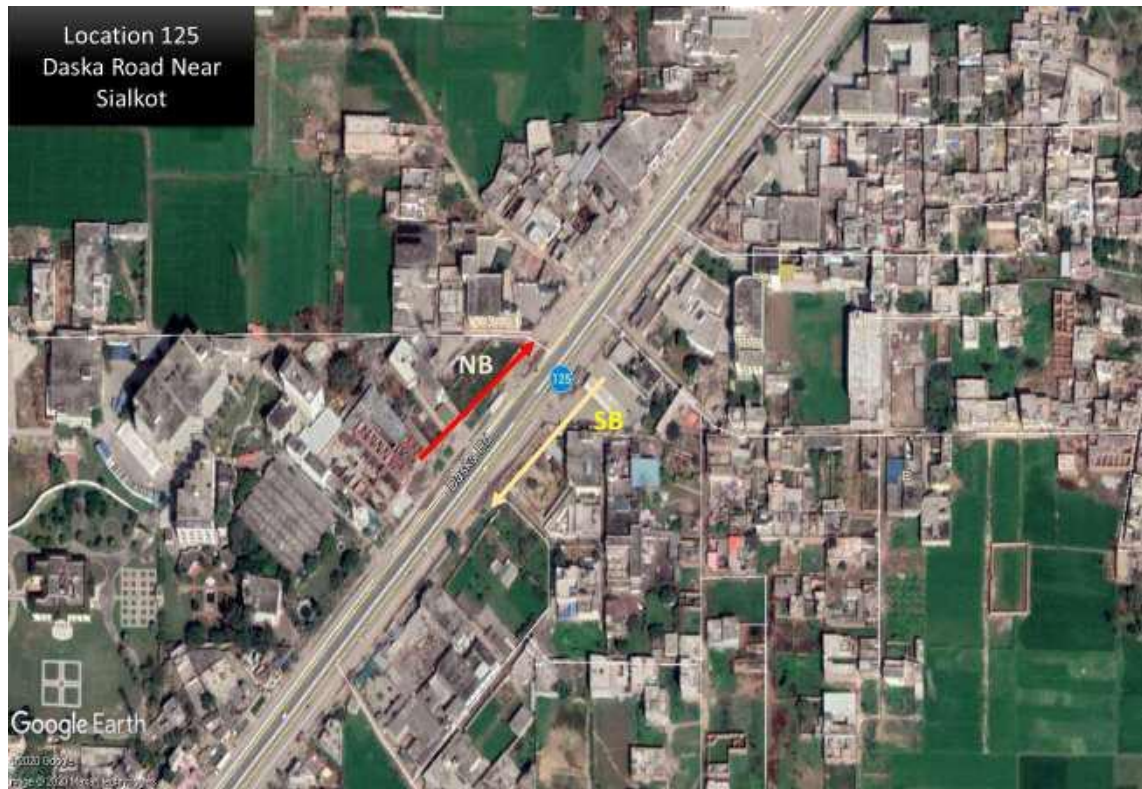


Figure 2-165: Satellite Imagery of Location ID 125

2.4.63 Location ID 126

ID 126 is located on Pasrur Road near Sialkot. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Pasrur to Sialkot is taken as North Bound whereas Traffic from Sialkot to Pasrur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-166: Satellite Imagery of Location ID 126

2.4.64 Location ID 127

ID 127 is located on Gujranwala Road near Daska. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Gujranwala to Daska is taken as North Bound whereas Traffic from Daska to Gujranwala is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-167: Satellite Imagery of Location ID 127

2.4.65 Location ID 128

ID 128 is located on Pasrur Road near Daska. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Pasrur to Daska is taken as North Bound whereas Traffic from Daska to Pasrur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-168: Satellite Imagery of Location ID 128

2.4.66 Location ID 129

ID 129 is located on Pasrur Road near Narowal. It is a 4-lane divided Highway with width of each lane being 3.3 meters. Traffic from Narowal to Pasrur is taken as North Bound whereas Traffic from Pasrur to Narowal is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-169: Satellite Imagery of Location ID 129

2.4.67 Location ID 130

ID 130 is located on Shakargarh ~ Zafarwal Road near Shakargarh. It is a 2-lane Highway with width of each lane being 3.3 meters. Traffic from Shakargarh to Zafarwal is taken as North Bound whereas Traffic from Zafarwal to Shakargarh is taken as South Bound. The satellite imagery is shown in figure.

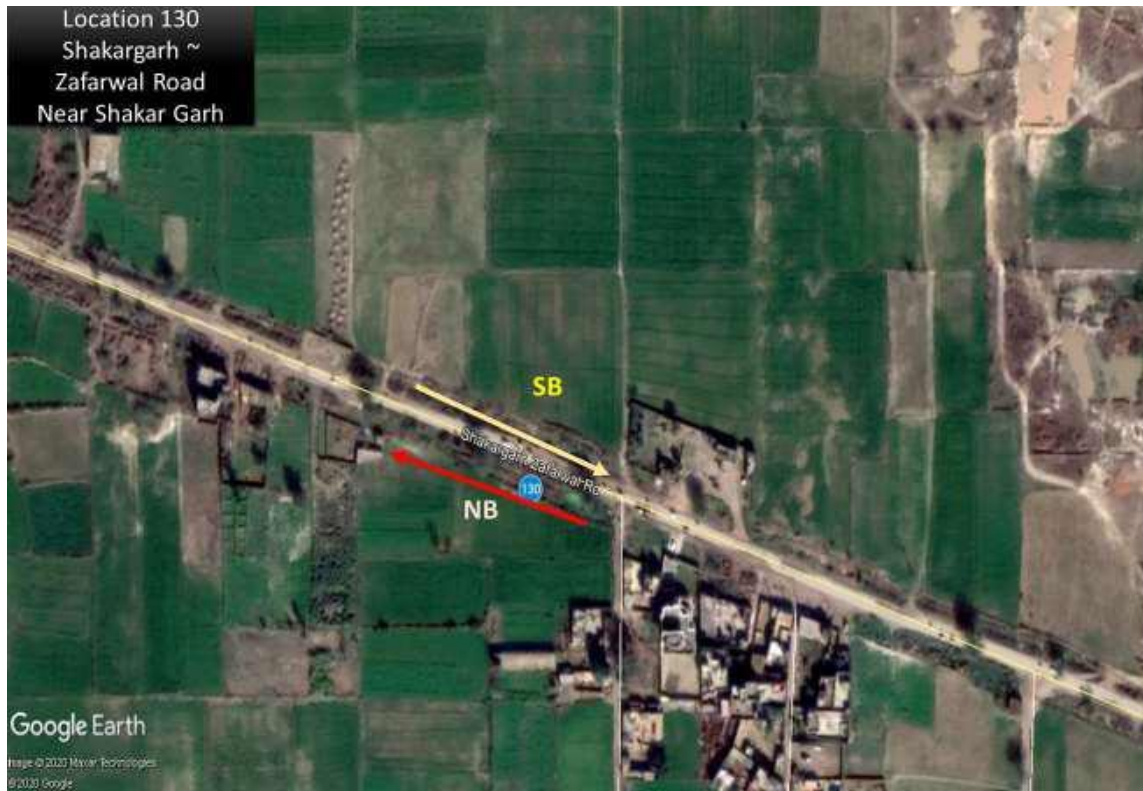


Figure 2-170: Satellite Imagery of Location ID 130

2.4.68 Location ID 131

ID 131 is located on Narowal ~ Shakargarh Road near Shakargarh. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Narowal to Shakargarh is taken as North Bound whereas Traffic from Shakargarh to Narowal is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-171: Satellite Imagery of Location ID 131

2.4.69 Location ID 132

ID 132 is located on Narowal ~ Muridke Road near Narang Morr. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Muridke to Narang Mandi is taken as North Bound whereas Traffic from Narang Mandi to Muridke is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-172: Satellite Imagery of Location ID 132

2.4.70 Location ID 133

ID 133 is located on Narowal ~ Muridke Road near Narang Morr. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Shahdara to Kala Khatai is taken as North Bound whereas Traffic from Kala Khatai to Shahdara is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-173: Satellite Imagery of Location ID 133

2.4.71 Location ID 134

ID 134 is located on Mianwali ~ Talagang Road near Mianwali. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Muzaffargarh to Mianwali is taken as North Bound whereas Traffic from Mianwali to Muzaffargarh is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-174: Satellite Imagery of Location ID 134

2.4.72 Location ID 135

ID 135 is located on Bhakkar ~ Jhang Road near Bhakkar. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Layyah to Bhakkar is taken as North Bound whereas Traffic froms Bhakkar to layyah is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-175: Satellite Imagery of Location ID 135

2.4.73 Location ID 136

ID 136 is located on Gujranwala Road near Hafizabad. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Hafizabad to Gujranwala is taken as North Bound whereas Traffic from Gujranwala to Hafizabad taken as South Bound. The satellite imagery is shown in figure.



Figure 2-176: Satellite Imagery of Location ID 136

2.4.74 Location ID 137

ID 137 is located on Jhang Road near Shorkot. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Kabirwala to Shorkot is taken as North Bound whereas Traffic from Shorkot to Kabirwala taken as South Bound. The satellite imagery is shown in figure.

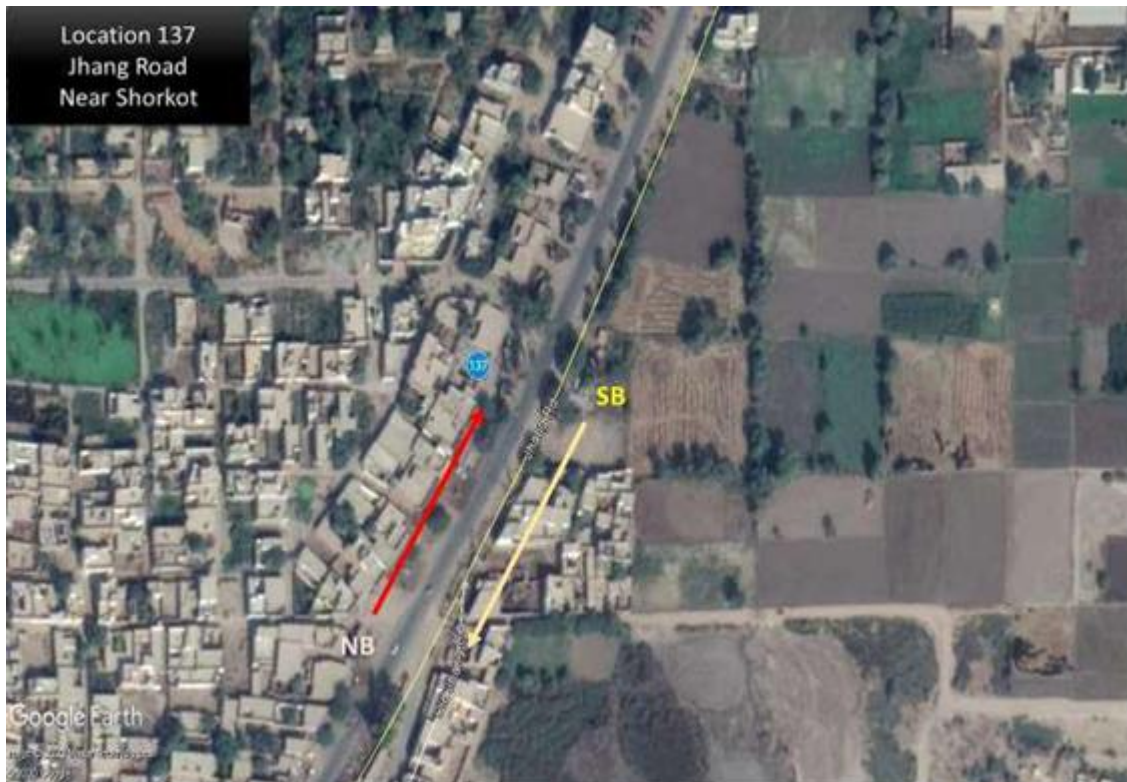


Figure 2-177: Satellite Imagery of Location ID 137

2.4.75 Location ID 138

ID 138 is located on Jhang ~ Chiniot Road near Jhang. It is a 2-lane Highway with width of each lane being 3.6 meters. Traffic from Jhang to Chiniot is taken as North Bound whereas Traffic from Chiniot to Jhang taken as South Bound. The satellite imagery is shown in figure.



Figure 2-178: Satellite Imagery of Location ID 138

2.4.76 Location ID 139

ID 139 is located on Samundri Road near Digikot. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Samundri to Faisalabad is taken as North Bound whereas Traffic from Faisalabad to Samundri taken as South Bound. The satellite imagery is shown in figure.



Figure 2-179: Satellite Imagery of Location ID 139

2.4.77 Location ID 140

ID 140 is located on N-5 near Okara. It is a 4-lane divided Highway with width of each lane being 3.6 meters. Traffic from Multan to Lahore is taken as North Bound whereas Traffic from Lahore to Multan taken as South Bound. The satellite imagery is shown in figure.



Figure 2-180: Satellite Imagery of Location ID 140

2.5 Package – IV (Punjab – 2)

There are 28 locations as identified by the Client for 24-hours Traffic Counts and O-D Survey for package - IV. Figure shows all 28 locations of package-IV.

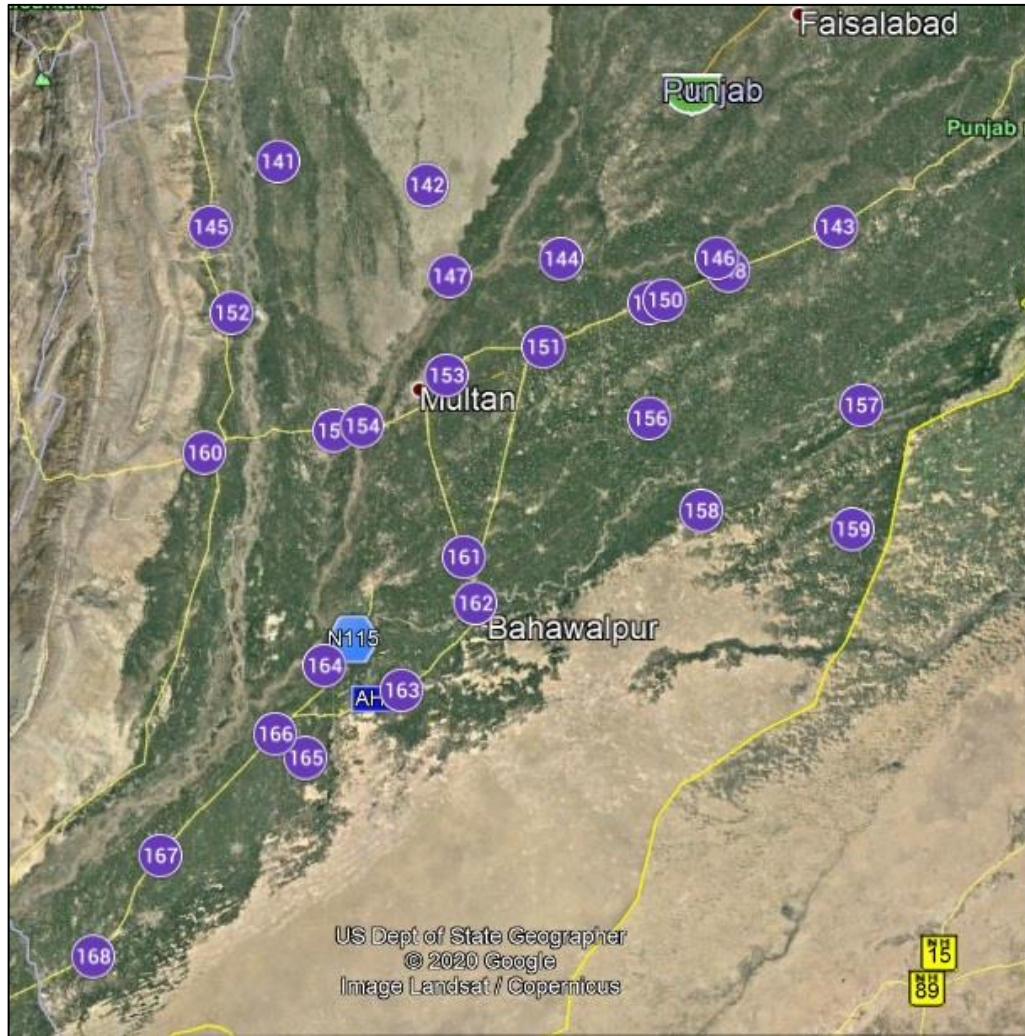


Figure 2-181: All locations of Package-IV

**Package – 4 O-D Survey ,Punjab - II
(28 Locations)**

ID	Location Description	ID	Location Description
141	Karor -Layyah Road (Bhakkar - Layyah)	157	Arifwala Sahiwal Road (Arifwala -Bahaw...
142	Garh Maharaja Road (Chaubara - Garh M...	158	Vehari Road (Vehari -Hasilpur)
143	N-5 Near Sahiwal	159	Near Haroonabad
144	Jhang Road (Shorkot -Sarai Sidhu)	160	N-70 (D.G. Khan - Rakhni)
145	N-55 (D.I.Khan - Taunsa)	161	N-5 Near Lodhran
146	Toba Chichawatni Road (Chichawatni - T...	162	N-5(Lodhran -Bahawarpur)
147	Muzaffargarh Garh Mor Road (Garh Ma...	163	N-5 Near Ahmedpur
148	N-5 Near Chichawatni	164	Ali Pur Uch Sharif Road (Alipur -Uch Shar...
149	N-5(Chichawantni -Mian Channun)	165	Liaquatpur - Bahawalpur Road (Ahmedp...
150	Mian Channun Burewala Road (Mian Ch...	166	N-5(Uch Sharif - T.M.Panah)
151	N-5 Near Khanewal	167	N-5 Near Rahim Yar Khan
152	Taunsa Barrage Road (Kot Addu - Shada...	168	N-5 Near Sadiqabad
153	N-5 Near Multan		
154	N-70 (Multan - Muzaffargarh)		
155	N-70 (Muzaffargarh - D.G. Khan)		
156	Vehari Burewala Road (Burewala - Vehari)		

Figure 2-182: Description of Locations of Package – IV

2.5.1 Location ID 141

Location ID 141 located on Karor to Layyah Road. It is 6 to 7 meters two lanes urban highway (One Lane for each side of traffic) which connects two cities of Punjab Kot Adu and Layyah. Traffic going from Layyah to Kot Adu is taken as North Bound NB. Traffic going from Kot Addu to Layyah is taken as South Bound SB. Figure shows Location ID 141.

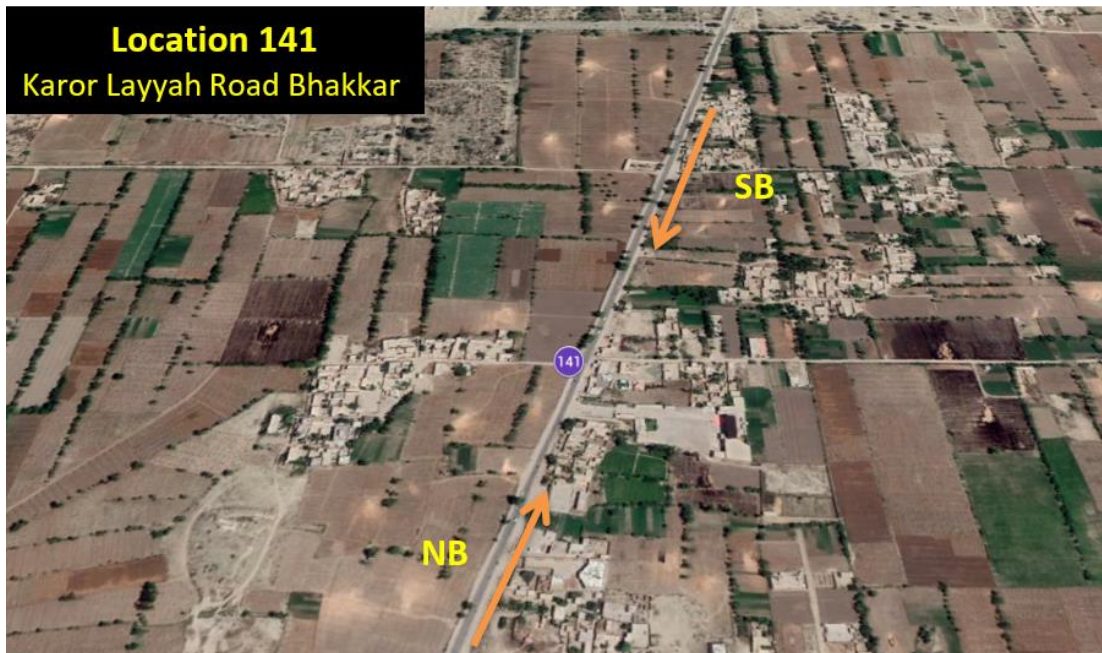


Figure 2-183: Satellite Image of Location ID 141



Figure 2-184: Location ID 141

2.5.2 Location ID 142

Location ID 142 located on Garh Maharaja Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic) which connects two cities of Punjab Layyah and Shorkot. Traffic going from Layyah to Shorkot is taken as North Bound NB. Traffic going from Shorkot to Layyah is taken as South Bound SB. Figures shows Location ID 142.



Figure 2-185: Satellite Image of Location ID 142



Figure 2-186: Location ID 142

2.5.3 Location ID 143

Location ID 143 located on main GT Road N-5 on Okara Toll Plaza. It is 2 lanes each side main carriageway. Location ID 143 connects two cities Okara and Sahiwal. Traffic going from Sahiwal to Okara is taken as North Bound NB. Traffic going from Okara to Sahiwal is taken as South Bound SB. Figure shows Location ID 143.



Figure 2-187: Satellite Image of Location ID 143



Figure 2-188: Location ID 143

2.5.4 Location ID 144

Location ID 144 located on Jhang Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic) which connects two cities of Punjab Shorkot and Kabirwala. Traffic going from Kabirwala to Shorkot is taken as North Bound NB. Traffic going from Shorkot to Kabirwala is taken as South Bound SB. Figure shows Location ID 144.

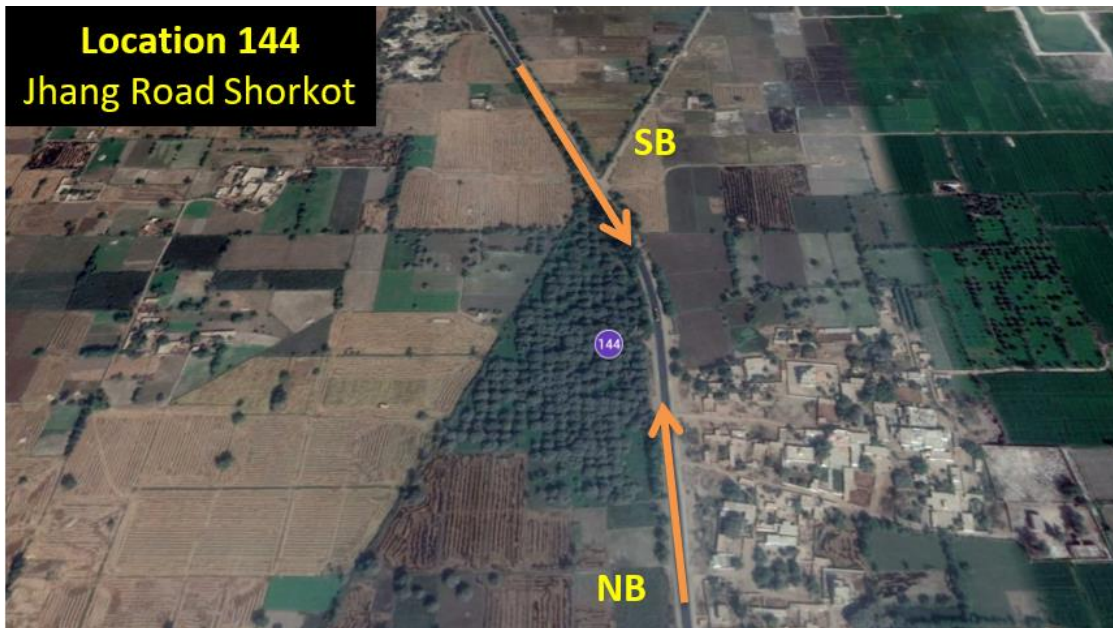


Figure 2-189: Satellite Image of Location ID 144



Figure 2-190: Location ID 144

2.5.5 Location ID 145

Location ID 145 located on Indus Highway N-55. It is 2 lanes main carriageway. Location ID 145 connects two cities DG Khan and Taunsa. Traffic going from DG Khan to Taunsa is taken as North Bound NB. Traffic going from Taunsa to DG Khan is taken as South Bound SB. Figure shows Location ID 145.

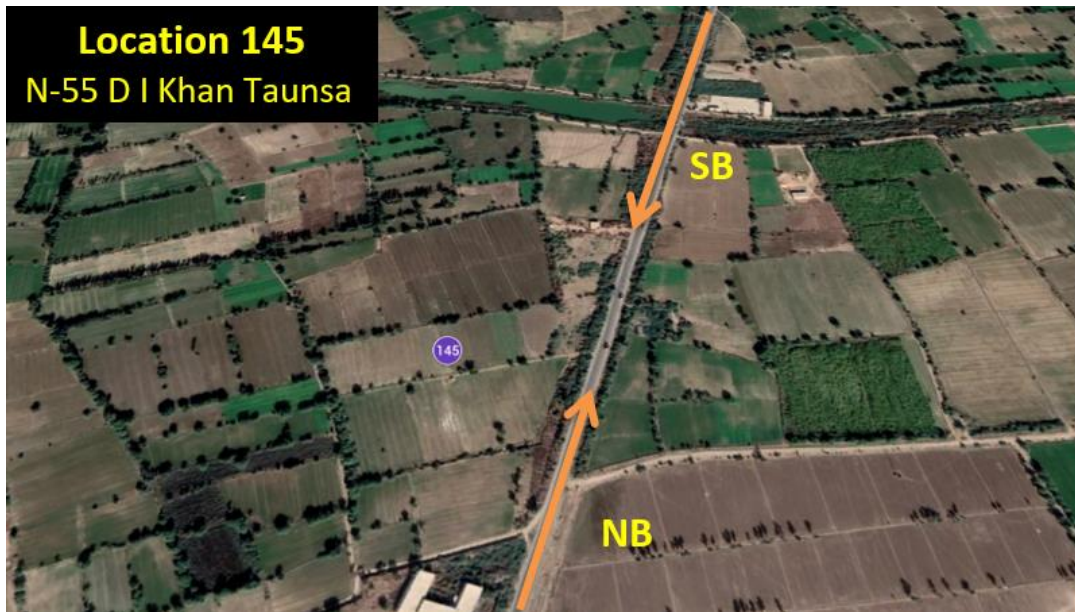


Figure 2-191: Satellite Image of Location ID 145



Figure 2-192: Location ID 145

2.5.6 Location ID 146

Location ID 146 located on Chichawatni to Toba Tek Singh. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic) which connects two cities of Punjab Toba Tek Singh and Chichawatni. Traffic going from Toba Tek Singh to Chichawatni is taken as North Bound NB. Traffic going from Chichawatni to Toba Tek Singh is taken as South Bound SB. Figure shows Location ID 146.



Figure 2-193: Satellite Image of Location ID 146



Figure 2-194: Location ID 146

2.5.7 Location ID 147

Location ID 147 located on Muzaffargarh Garh Mor Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic) which connects two cities of Punjab Muzaffargarh and Jhang. Traffic going from Jhang to Muzaffargarh is taken as North Bound NB. Traffic going from Muzaffargarh to Jhang is taken as South Bound SB. Figure shows Location ID 147.



Figure 2-195: Satellite Image of Location ID 147



Figure 2-196: Location ID 147

2.5.8 Location ID 148

Location ID 148 located on main GT Road N-5 on Harappa Toll Plaza. It is 2 lanes each side main carriageway. Location ID 148 connects two cities Chichawatni and Sahiwal. Traffic going from Chichawatni to Sahiwal is taken as North Bound NB. Traffic going from Sahiwal to Chichawatni is taken as South Bound SB. Figure shows Location ID 148.

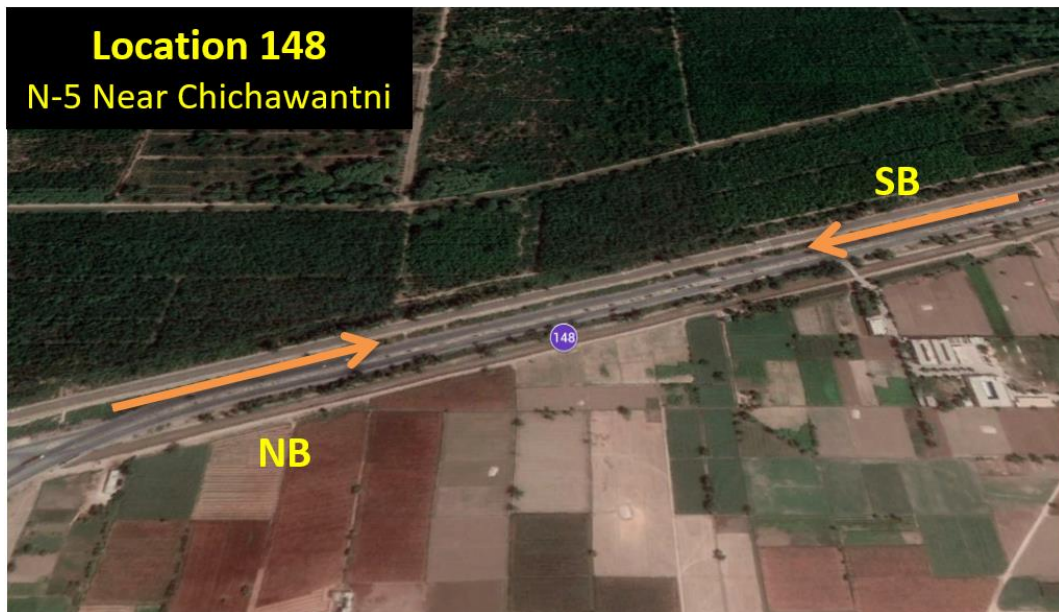


Figure 2-197: Satellite Image of Location ID 148



Figure 2-198: Location ID 148

2.5.9 Location ID 149

Location ID 149 located on main GT Road N-5 on Mian Channu Toll Plaza. It is 2 lanes each side main carriageway. Location ID 149 connects two cities Mian Channu and Chichawatni. Traffic going from Mian Channu to Chichawatni is taken as North Bound NB. Traffic going from Chichawatni to Mian Channu is taken as South Bound SB. Figure shows Location ID 149.



Figure 2-199: Satellite Image of Location ID 149



Figure 2-200: Location ID 149

2.5.10 Location ID 150

Location ID 150 located on Mian Channun Burewala Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic) which connects two cities of Punjab Mian Channu and Burewala. Traffic going from Burewala to Mian Channu is taken as North Bound NB. Traffic going from Mian Channu to Burewala is taken as South Bound SB. Figure shows Location ID 150.

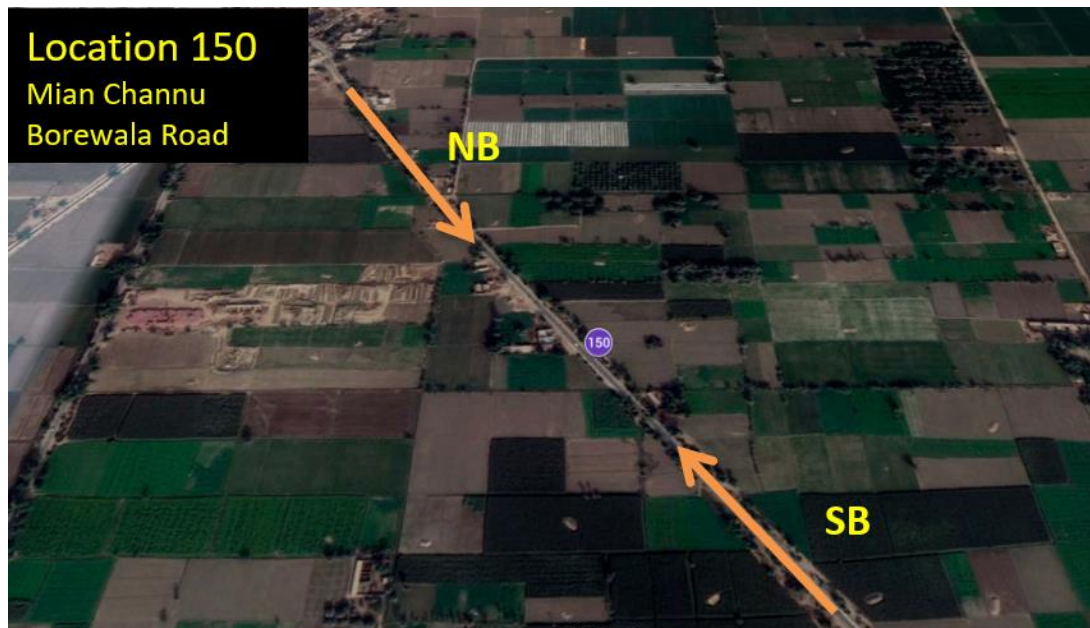


Figure 2-201: Satellite Image of Location ID 150



Figure 2-202: Location ID 150

2.5.11 Location ID 151

Location ID 151 located on Khanewal Toll Plaza. It is 2 lanes each side main carriageway. Location ID 151 connects two cities Khanewal and Mian Channu. Traffic going from Khanewal to Mian Channu is taken as North Bound NB. Traffic going from Mian Channu to Khanewal is taken as South Bound SB. Figure shows Location ID 151.



Figure 2-203: Satellite Image of Location ID 151



Figure 2-204: Location ID 151

2.5.12 Location ID 152

Location ID 152 located on Taunsa Barrage Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic). It is a link road which connects N-55 Indus Highway with Layyah and Kot Addu. Traffic going from N-55 to Layyah is taken as North Bound NB. Traffic going from Layyah to N-55 is taken as South Bound SB. Figure shows Location ID 152.



Figure 2-205: Satellite Image of Location ID 152



Figure 2-206: Location ID 152

2.5.13 Location ID 153

Location ID 153 located on Lodhreh Toll Plaza on N-5A. It is 2 lanes each side main carriageway. It is also defined as bypass between Khanewal and Lodhreh. Location ID 153 connects two cities Khanewal and Lodhreh. Traffic going from Lodhreh to Khanewal is taken as North Bound NB. Traffic going from Khanewal to Lodhreh is taken as South Bound SB. Figure shows Location ID 153.



Figure 2-207: Satellite Image of Location ID 153



Figure 2-208: Location ID 153

2.5.14 Location ID 154

Location ID 154 located on Sher Shah Toll Plaza on N-70. It is 2 lanes each side main carriageway. It connects two cities of Punjab Multan and Muzaffargarh. Traffic going from Multan to Muzaffargarh is taken as North Bound NB. Traffic going from Muzaffargarh to Multan is taken as South Bound SB. Figure shows Location ID 154.

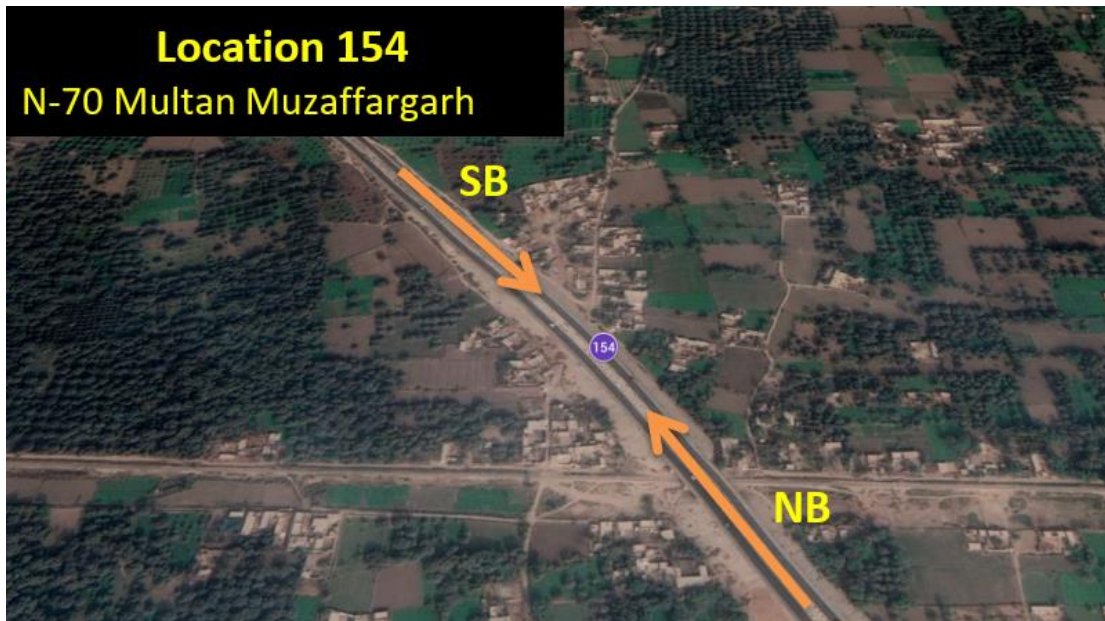


Figure 2-209: Satellite Image of Location ID 154



Figure 2-210: Location ID 154

2.5.15 Location ID 155

Location ID 155 located on Ghazi Ghat Toll Plaza on N-70. It is 2 lanes each side main carriageway. It connects two cities of Punjab Muzaffargarh and DG Khan. Traffic going from Muzaffargarh to DG Khan is taken as North Bound NB. Traffic going from DG Khan to Muzaffargarh is taken as South Bound SB. Figure shows Location ID 155.



Figure 2-211: Satellite Image of Location ID 155



Figure 2-212: Location ID 155

2.5.16 Location ID 156

Location ID 156 located on Burewala Vehari Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic). It connects two cities Vehari and Burewala. Traffic going from Vehari to Burewala is taken as North Bound NB. Traffic going from Burewala to Vehari is taken as South Bound SB. Figure shows Location ID 156.



Figure 2-213: Satellite Image of Location ID 156



Figure 2-214: Location ID 156

2.5.17 Location ID 157

Location ID 157 located on Arifwala Sahiwal Road Bahawalnagar Toll Plaza. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic). It connects two cities Bahawalnagar and Arifwala. Traffic going from Arifwala to Bahawalnagar is taken as North Bound NB. Traffic going from Bahawalnagar to Arifwala is taken as South Bound SB. Figure shows Location ID 157.

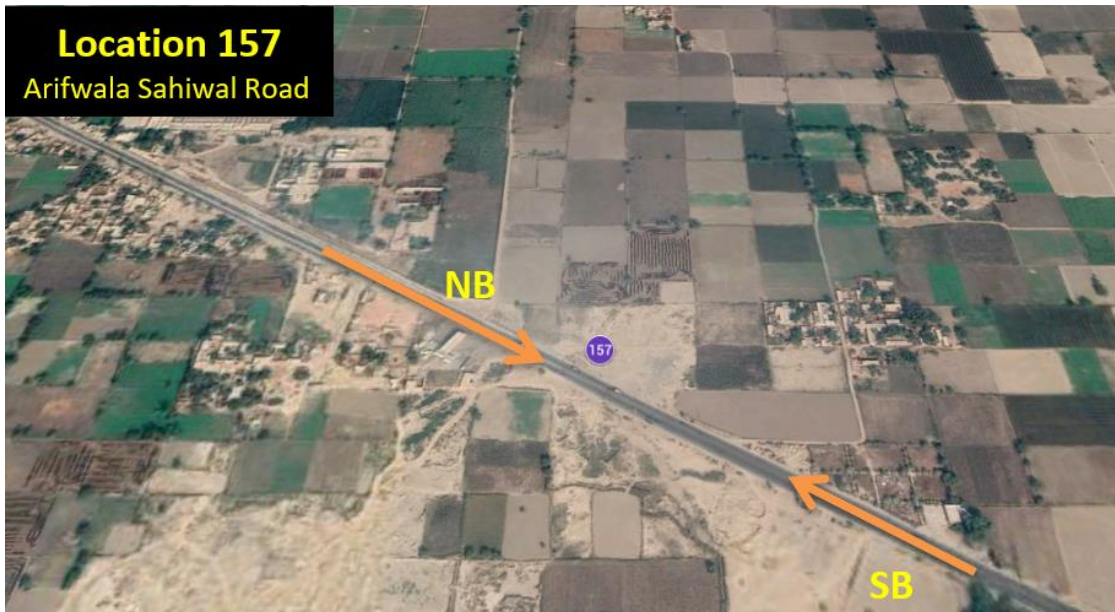


Figure 2-215: Satellite Image of Location ID 157



Figure 2-216: Location ID 157

2.5.18 Location ID 158

Location ID 158 located on Vehari Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic). It connects two cities Vehari and Hasilpur. Traffic going from Hasilpur to Vehari is taken as North Bound NB. Traffic going from Vehari to Hasilpur is taken as South Bound SB. Figure shows Location ID 158.

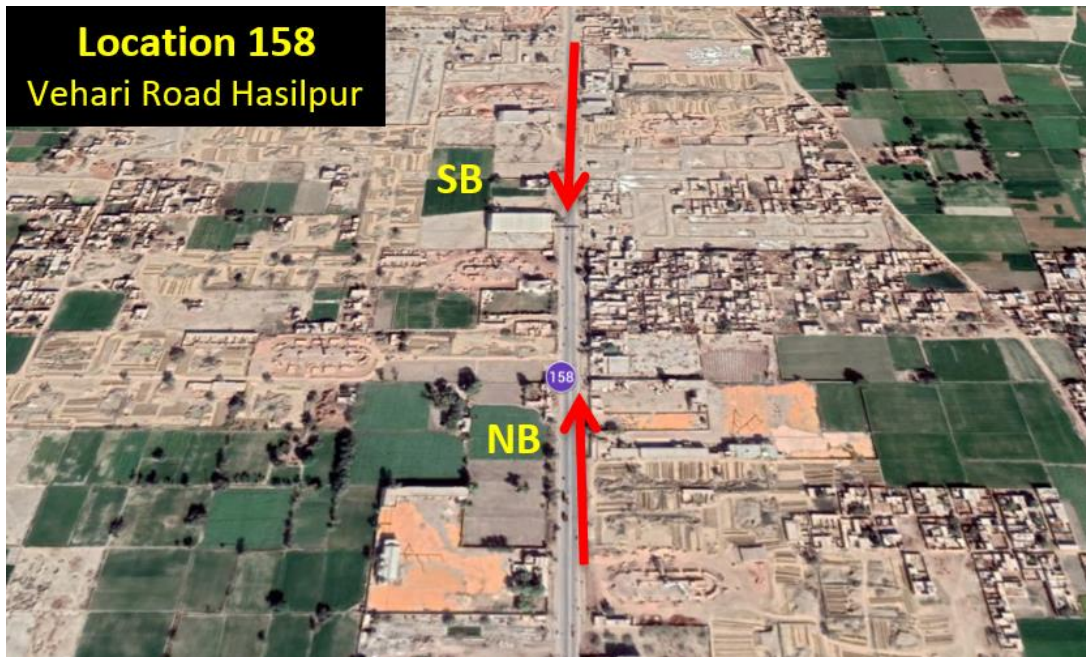


Figure 2-217: Satellite Image of Location ID 158



Figure 2-218: Location ID 158

2.5.19 Location ID 159

Location ID 159 located on Haroonabad Bahawalnagar Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic). It connects two cities Bahawalnagar and Haroonabad. Traffic going from Haroonabad to Bahawalnagar is taken as North Bound NB. Traffic going from Bahawalnagar to Haroonabad is taken as South Bound SB. Figure shows Location ID 159.

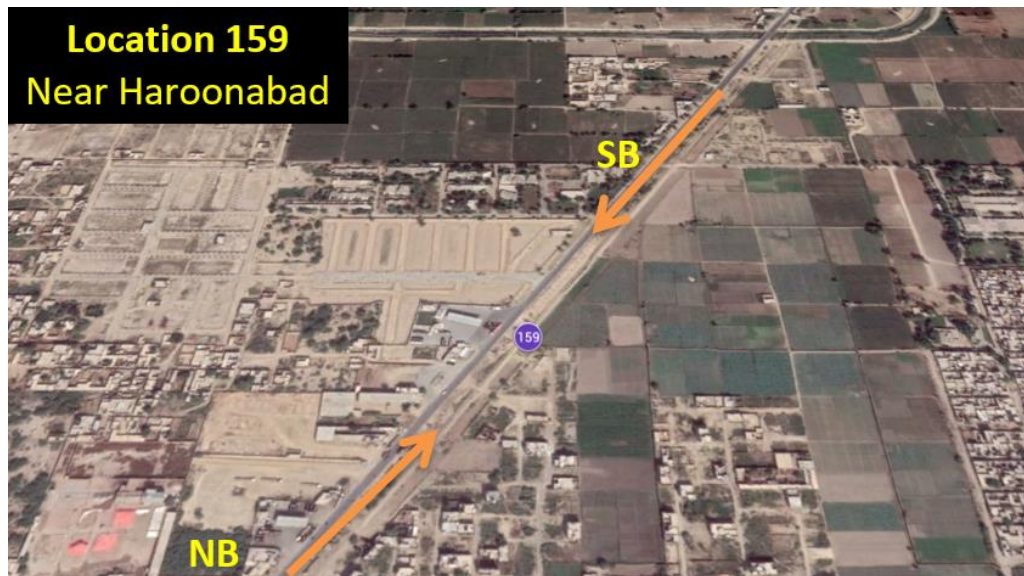


Figure 2-219: Satellite Image of Location ID 159



Figure 2-220: Location ID 159

2.5.20 Location ID 160

Location ID 160 located on National Highway N-70. It is 2 lanes main carriageway. Location ID 160 connects two cities DG Khan and Sakhi Sarwar. Traffic going from DG Khan to Sakhi Sarwar is taken as North Bound NB. Traffic going from Sakhi Sarwar to DG Khan is taken as South Bound SB. Figure shows Location ID 160.



Figure 2-221: Satellite Image of Location ID 160



Figure 2-222: Location ID 160

2.5.21 Location ID 161

Location ID 161 located on Basti Malooq Toll Plaza. It is 2 lanes each side main carriageway. Location ID 161 connects two cities Multan and Lodhren. Traffic going from Lodhren to Multan is taken as North Bound NB. Traffic going from Multan to Lodhren is taken as South Bound SB. Figure shows Location ID 161.



Figure 2-223: Satellite Image of Location ID 161



Figure 2-224: Location ID 161

2.5.22 Location ID 162

Location ID 162 located on Sutlej Toll Plaza. It is 2 lanes each side main carriageway. Location ID 162 connects two cities Bahawalpur and Lodhren. Traffic going from Bahawalpur to Lodhren is taken as North Bound NB. Traffic going from Lodhren to Bahawalpur is taken as South Bound SB. Figure shows Location ID 162.

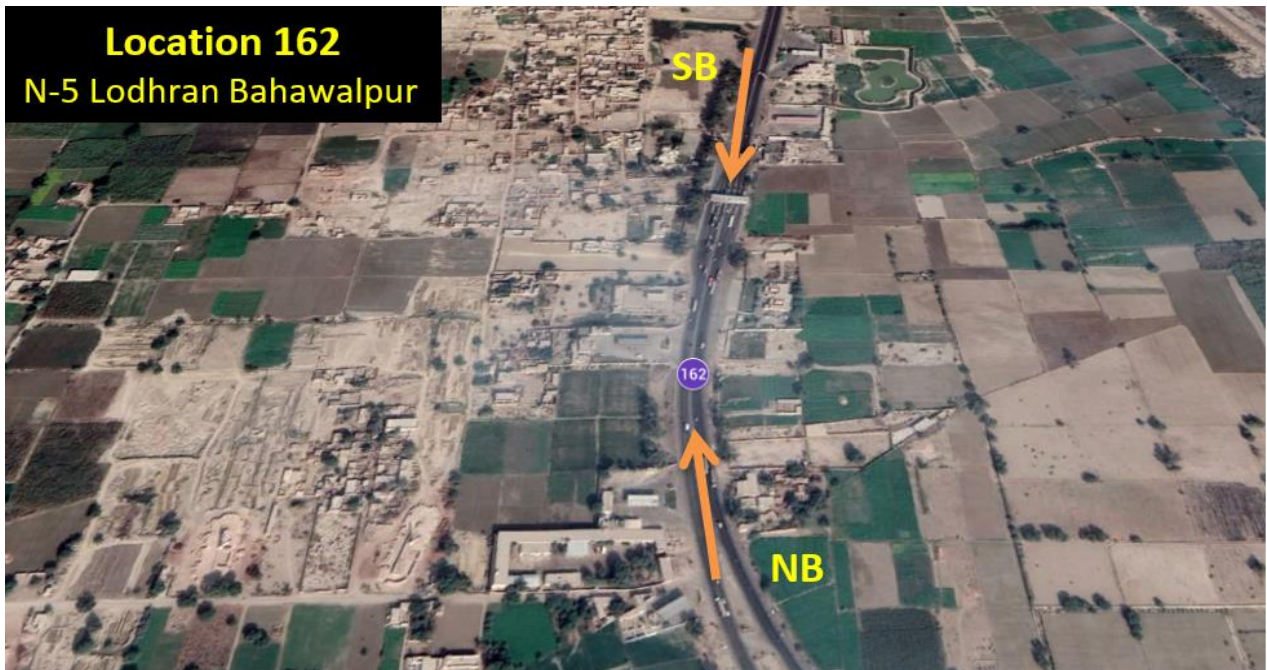


Figure 2-225: Satellite Image of Location ID 162



Figure 2-226: Location ID 162

2.5.23 Location ID 163

Location ID 163 located on Ahmedpur Toll Plaza. It is 2 lanes each side main carriageway. Location ID 163 connects two cities Bahawalpur and Ahmedpur. Traffic going from Ahmedpur to Bahawalpur is taken as North Bound NB. Traffic going from Bahawalpur to Ahmedpur is taken as South Bound SB. Figure shows Location ID 163.

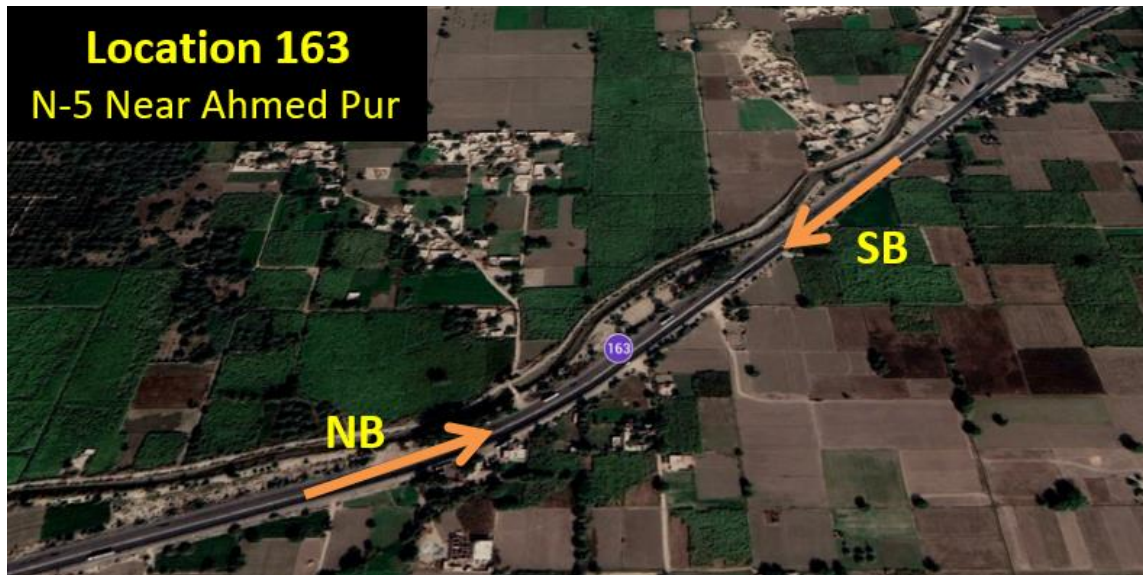


Figure 2-227: Satellite Image of Location ID 163



Figure 2-228: Location ID 163

2.5.24 Location ID 164

Location ID 164 located on Alipur Uch Sharif Road. It is 5 to 6 meters two lanes urban highway (One Lane for each side of traffic). It connects two cities Alipur and Uch Sharif. Traffic going from Uch Sharif to Alipur is taken as North Bound NB. Traffic going from Alipur to Uch Sharif is taken as South Bound SB. Figure shows Location ID 164.



Figure 2-229: Satellite Image of Location ID 164



Figure 2-230: Location ID 164

2.5.25 Location ID 165

Location ID 165 located on Liaquatpur Road. It is 3 to 4 meters two lanes urban highway (One Lane for each side of traffic). It connects two cities Liaquatpur and Chani Goth. Traffic going from Liaquat to Chani Goth is taken as North Bound NB. Traffic going from Chani Goth to Liaquatpur is taken as South Bound SB. Figure shows Location ID 165.



Figure 2-231: Satellite Image of Location ID 165



Figure 2-232: Location ID 165

2.5.26 Location ID 166

Location ID 166 located on Khan Bella Toll Plaza. It is 2 lanes each side main carriageway. Location ID 166 connects two cities TM Panah and Zahir Pir. Traffic going from Zahir Pir to TM Panah is taken as North Bound NB. Traffic going from TM Panah to Zahir Pir is taken as South Bound SB. Figure shows Location ID 166.



Figure 2-233: Satellite Image of Location ID 166



Figure 2-234: Location ID 166

2.5.27 Location ID 167

Location ID 167 located on Khan Bella Toll Plaza. It is 2 lanes each side main carriageway. Location ID 167 connects two cities Rahimyar Khan and Zahir Pir. Traffic going from Rahimyar Khan to Zahir Pir is taken as North Bound NB. Traffic going from Zahir Pir to Rahimyar Khan is taken as South Bound SB. Figure shows Location ID 167.



Figure 2-235: Satellite Image of Location ID 167



Figure 2-236: Location ID 167

2.5.28 Location ID 168

Location ID 168 located on N-5 Before Sadiqabad City. It is 2 lanes each side main carriageway. Location ID 168 connects two cities Rahimyar Khan and Sadiqabad. Traffic going from Sadiqabad to Rahimyar Khan is taken as North Bound NB. Traffic going from Rahimyar Khan to Sadiqabad is taken as South Bound SB. Figure shows Location ID 168.

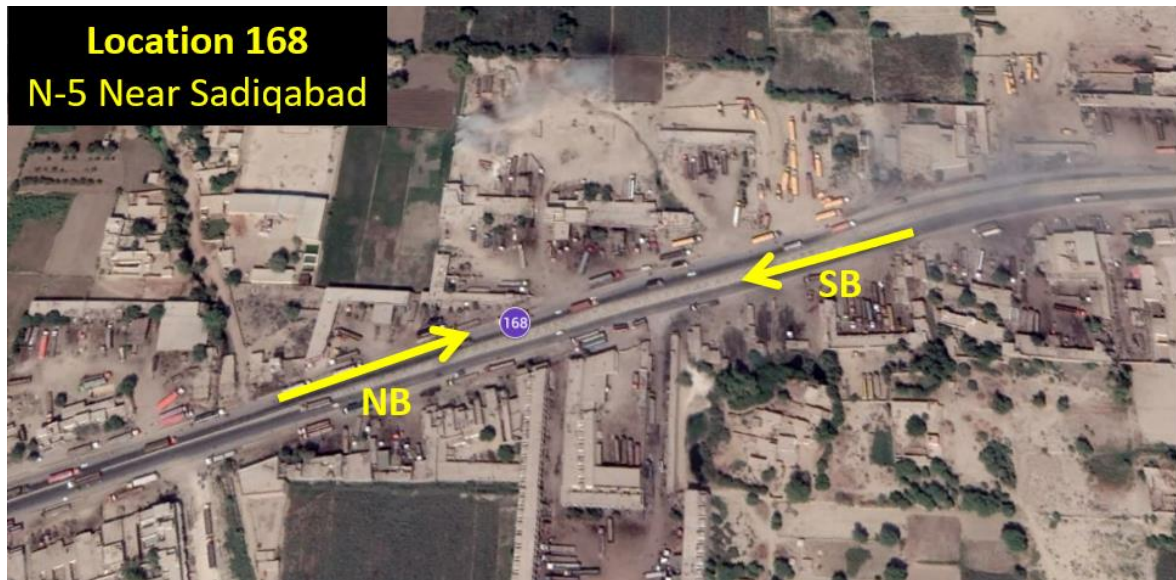


Figure 2-237: Satellite Image of Location ID 168



Figure 2-238: Location ID 168

2.6 Package – V (Sindh)

Package – V locations are located in Sindh Province of Pakistan. There are 25 locations as identified by client for 24-Hours Traffic counts and O-D Survey for Package-V. Figure and Table shows all 25 locations of package - V.

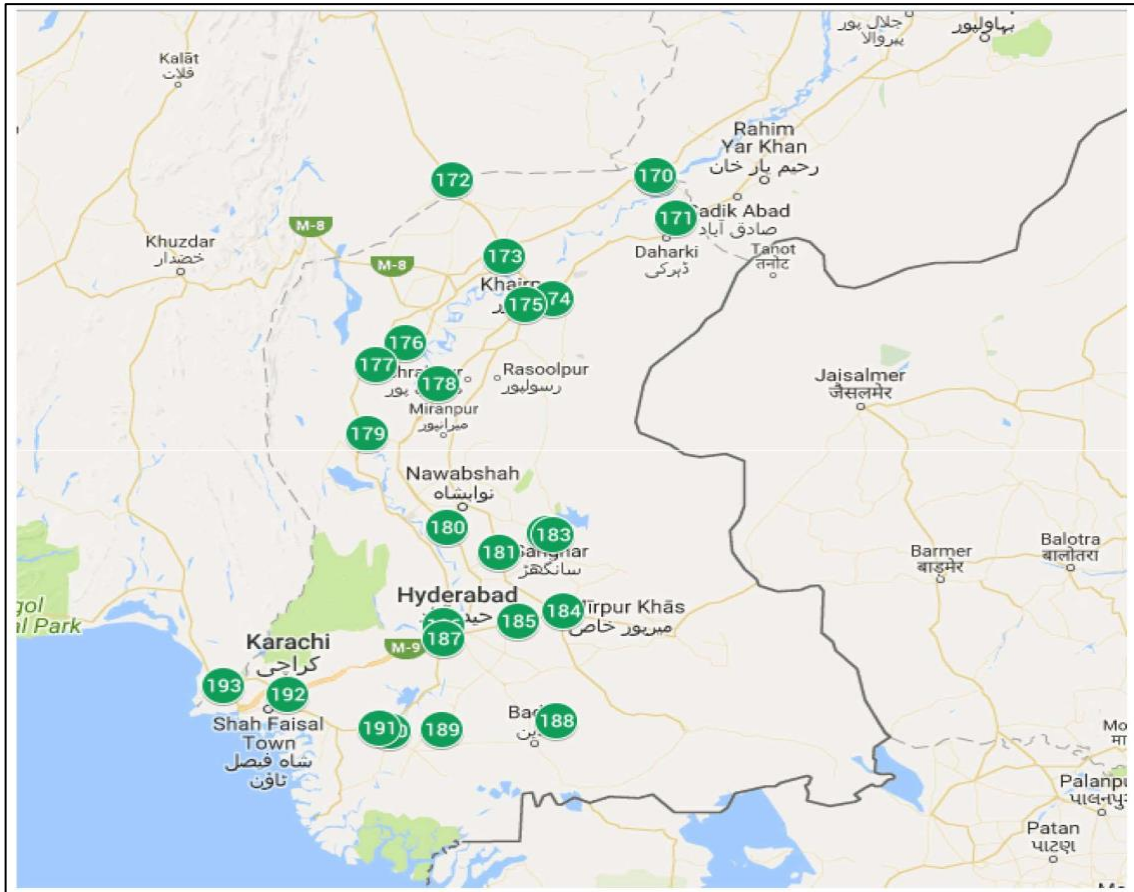


Figure 2-239: Satellite image of Survey Locations Package - V

**Package – 5 O-D Survey, Sindh
(25 Locations)**

ID	Location Description	ID	Location Description
169	Kashmore Gaddu Road (Rahimyar - Kash...	184	Khipro Road (Sindhri - Mirpur Khas)
170	N-55(Rojhan - Kashmor)	185	N-120 (Tando Allahyar)
171	N-5 (Saiqabad - Ubauro)	186	N-55 (Kotri -Thatta)
172	N65 (Jacobabad - Jhatpat)	187	N-5 (Hyderabad - Kotri)
173	N-65 (Sukkur - Shikarpur)	188	Digri Tando Bago Road
174	Saleh Pat Road (Rohri - Sorah)	189	T.M.Khan Mirpur Bathoro Road
175	N-5 (Rohri - Khairpur)	190	Thatta Sujawal Road (Thatta - Sujawal)
176	Sehewani Sark Road (Badrah - Dadu)	191	N-5 (Thatta - Karachi)
177	N-55 (Kambar - Mehar)	192	M-9 (Karachi - Hyderabad)
178	N-5 (Kot Diji - Kandiaro)	193	N-25 (Hub)
179	Dadu - Moro Road (Badhan - Dadu)		
180	N-5 (Sakrand - Hala)		
181	Shahdadpur Nawabshah Road (Nawabs...		
182	Nawabshah Road (Nawabashah - Sangh...		
183	Jamrao Road (Sorah - Jamaro Head		

Figure 2-240: Description of all Locations of Package – V

2.6.1 Location ID 169

ID 169 is located Kashmore ~ Guddu road which is a 2 lane road, with width of each lane being 3.3 meters. The road connects Rahim Yar Khan with Kashmore. Traffic going from Kashmore to Rahim Yar Khan is taken as North Bound whereas traffic going from Rahim Yar Khan to Kashmore is taken as South Bound. Figure Shows the satellite imagery of Location ID 169.



Figure 2-241: Satellite Imagery of Location ID 169

2.6.2 Location ID 170

ID 170 is located on Indus Highway N-55 near Kashmore. It is a 2 lane highway with width of each lane being 3.6 meters. It connects Karachi with Peshawar. Traffic from Kashmore to Rojhan is taken as North Bound whereas Traffic from Rojhan to Kashmore is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-242: Satellite Imagery of Location ID 170

2.6.3 Location ID 171

ID 171 is located on N-5 near Ubauro. It is a 4 lane divided highway with width of each lane being 3.6 meters. It connects Karachi with Torkham. Traffic from Ubauro to Sadiqabad is taken as North Bound whereas Traffic from Sadiqabad to Ubauro is taken as South Bound. The satellite imagery is shown in figure.

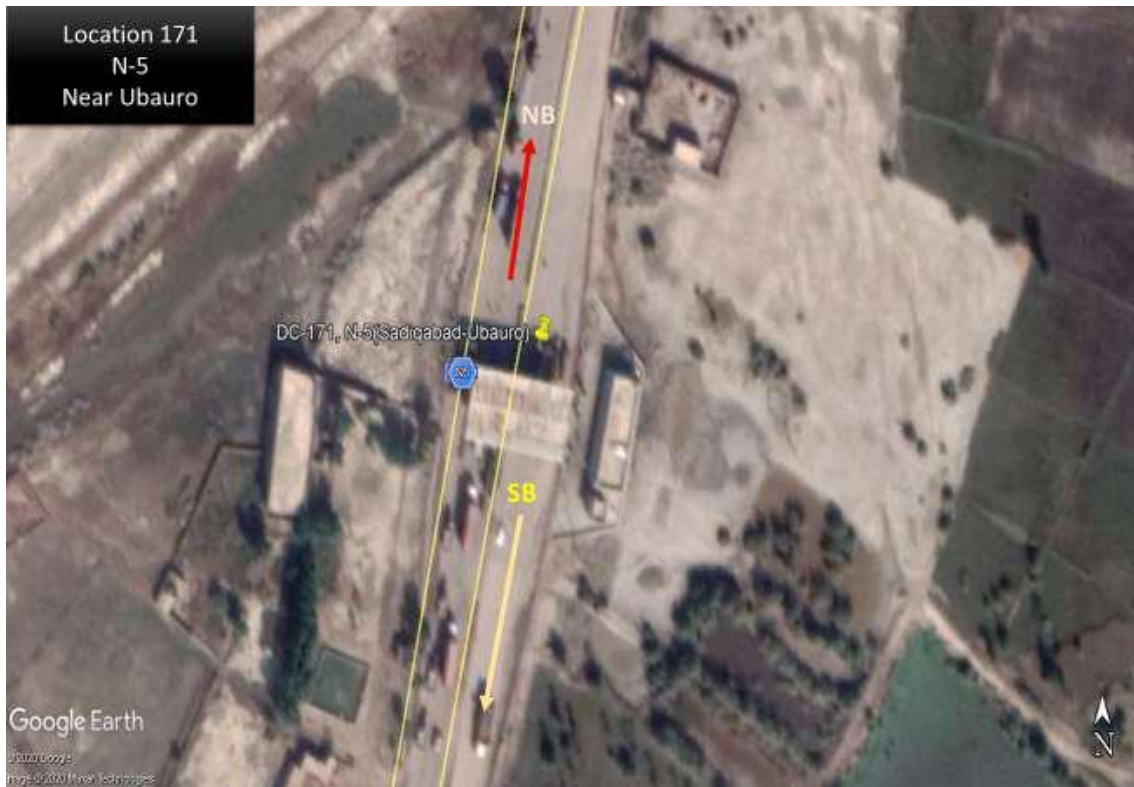


Figure 2-243: Satellite Imagery of Location ID 171

2.6.4 Location ID 172

ID 172 is located on N-65 near Jacobabad. It is a 2 lane highway with width of each lane being 3.6 meters. It is an integral connection to Quetta from Sukkur. Traffic from Shikarpur to Dera Murad Jamali is taken as North Bound whereas Traffic from Dera Murad Jamali to Shikarpur is taken as South Bound. The satellite imagery is shown in figure.

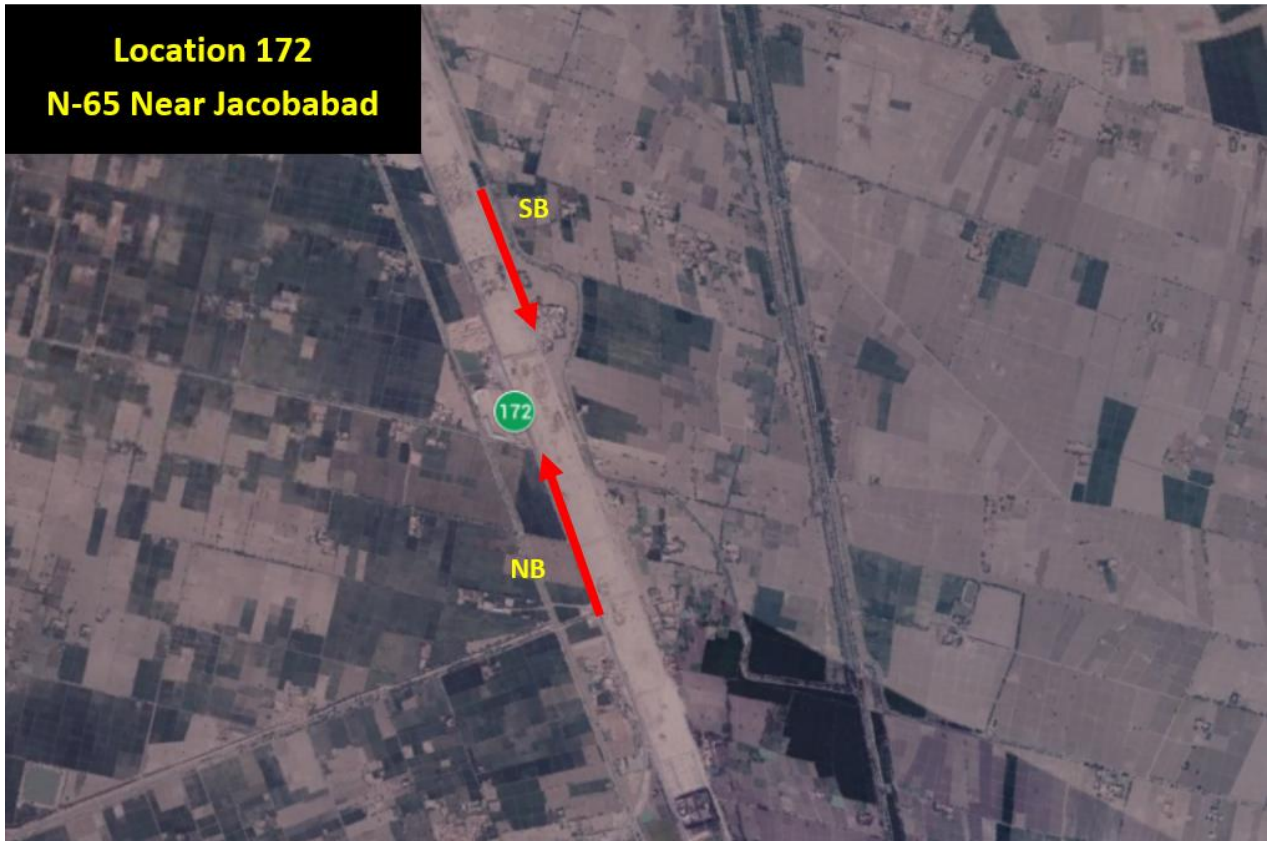


Figure 2-244: Satellite Imagery of Location ID 172

2.6.5 Location ID 173

ID 173 is located on N-65 near Shikarpur. It is a 4 lane divided Highway with width of each lane being 3.6 meters. It connects Sukkur to Quetta. Traffic from Sukkur to Shikarpur is taken as North Bound whereas Traffic from Shikarpur to Sukkur is taken as South Bound. The satellite imagery is shown in figure.

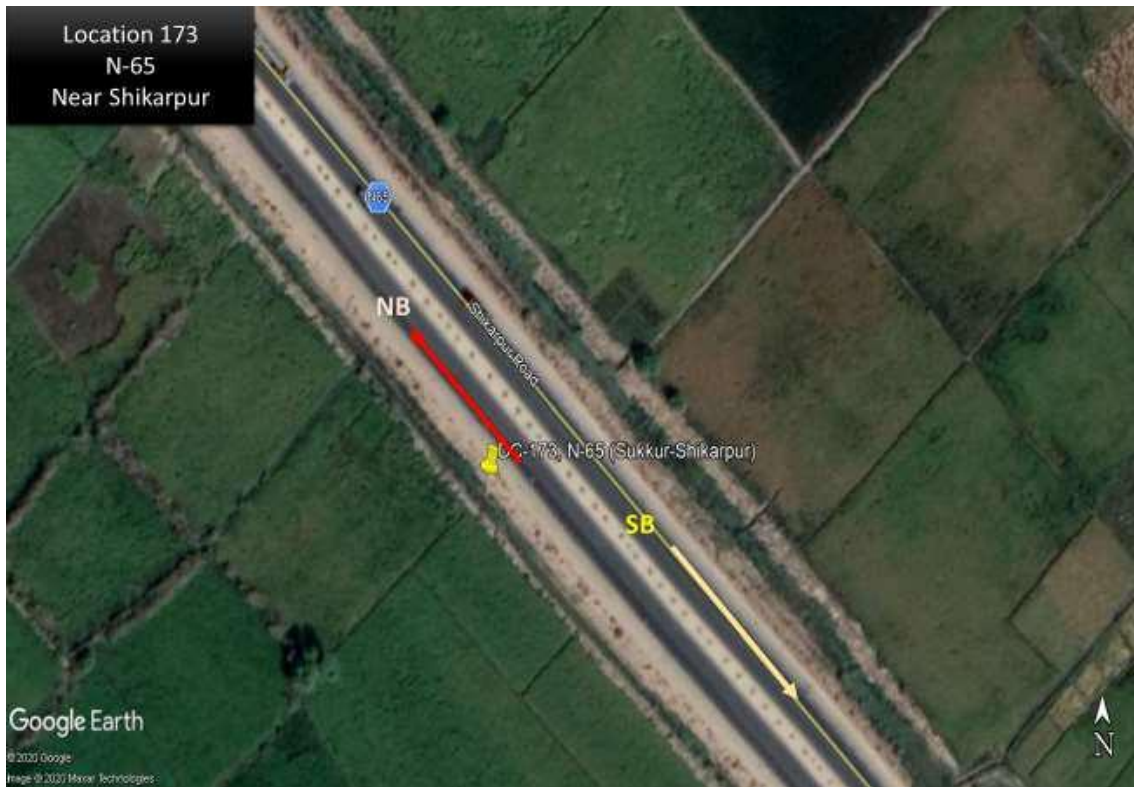


Figure 2-245: Satellite Imagery of Location ID 173

2.6.6 Location ID 174

ID 174 is located on Saleh Pat / Nara road near Saleh Pat. It is a 2 lane Highway with width of each lane being 3.3 meters. It connects Sorah to Rohri. Traffic from Sorah to Rohri is taken as North Bound whereas Traffic from Rohri to Sorah is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-246: Satellite Imagery of Location ID 174

2.6.7 Location ID 175

ID 175 is located on N-5 near Khairpur. It is a 4 lane divided Highway with width of each lane being 3.6 meters. It connects Karachi to Peshawar. Traffic from Khairpur to Rohri is taken as North Bound whereas Traffic from Rohri to Khairpur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-247: Satellite Imagery of Location ID 175

2.6.8 Location ID 176

ID 176 is located on Sehwani Sark Road near Badah. It is a 2 lane Highway with width of each lane being 3.0 meters. Traffic from Dadu to Badah is taken as North Bound whereas Traffic from badah to Dadu is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-248: Satellite Imagery of Location ID 176

2.6.9 Location ID 177

ID 177 is located on N-55 near Nasirabad. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Mehar to Qambar is taken as North Bound whereas Traffic from Qambar to Mehar is taken as South Bound.. The satellite imagery is shown in figure.



Figure 2-249: Satellite Imagery of Location ID 177

2.6.10 Location ID 178

ID 178 is located on N-5 near Hingorja. It is a 4 lane divided Highway with width of each lane being 3.6 meters. Traffic from Kandiaro to Kot Diji is taken as North Bound whereas Traffic from Kot Diji to Kandiaro is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-250: Satellite Imagery of Location ID 178

2.6.11 Location ID 179

ID 179 is located on Dadu Moro road near Dadu. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Moro to Dadu is taken as North Bound whereas Traffic from Dadu to Moro is taken as South Bound. The satellite imagery is shown in figure.

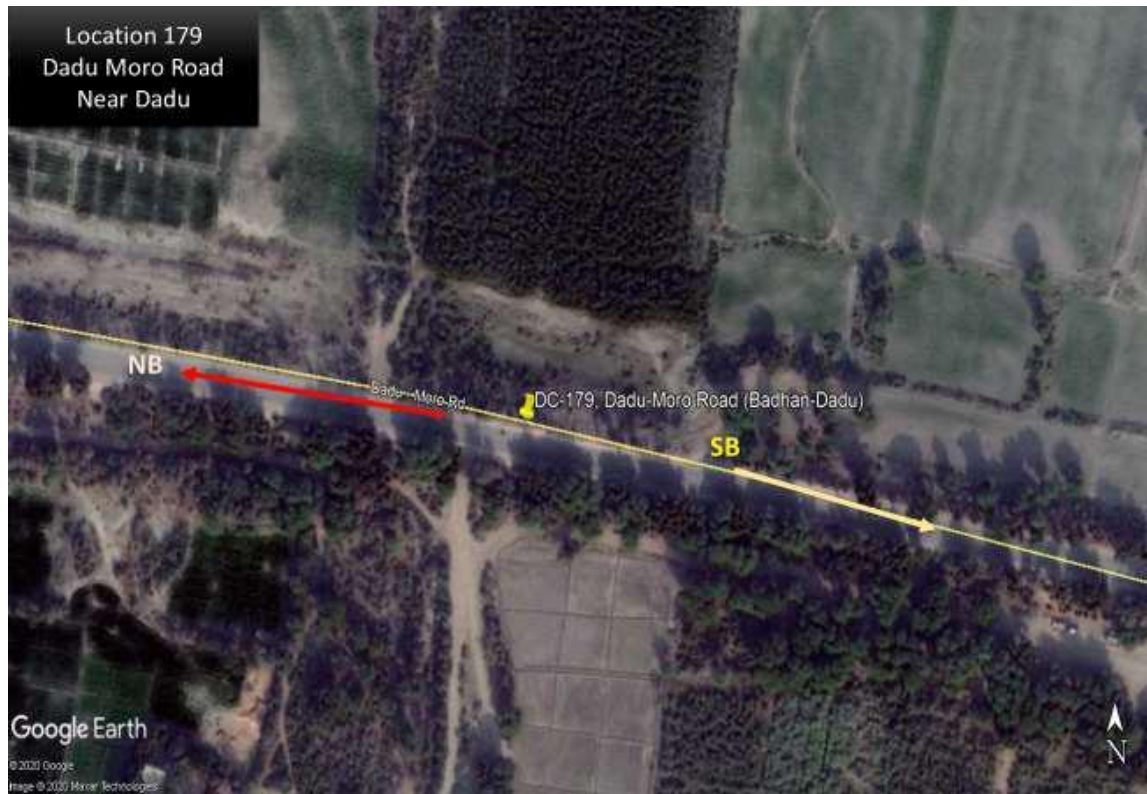


Figure 2-251: Satellite Imagery of Location ID 179

2.6.12 Location ID 180

ID 180 is located on N-5 near Saeedabad. It is a 4 lane divided Highway with width of each lane being 3.6 meters. Traffic from Hala to Sakrand is taken as North Bound whereas Traffic from Sakrand to Hala is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-252: Satellite Imagery of Location ID 180

2.6.13 Location ID 181

ID 181 is located on Shadadpur ~ Nawabshah Road near Goth Khan Rind. It is a 2 lane Highway with width of each lane being 3.0 meters. Traffic from Shadadpur to Nawabshah is taken as North Bound whereas Traffic from Nawabshah to Shadadpur is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-253: Satellite Imagery of Location ID 181

2.6.14 Location ID 182

ID 182 is located on Nawab Shah Road near Khadro. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Sanghar to Nawabshah is taken as North Bound whereas Traffic from Nawabshah to Sanghar is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-254: Satellite Imagery of Location ID 182

2.6.15 Location ID 183

ID 183 is located on Jamrao Road near Sanghar. It is a 2 lane Highway with width of each lane being 3.0 meters. Traffic from Jamrao to Sorah is taken as North Bound whereas Traffic from Sorah to Jamrao is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-255: Satellite Imagery of Location ID 183

2.6.16 Location ID 184

ID 184 is located on Khipro Road near Mirpur Khas. It is a 2 lane Highway with width of each lane being 3.6 meters. Traffic from Mirpur to Khipro is taken as North Bound whereas Traffic from Khipro to Mirpur is taken as South Bound.. The satellite imagery is shown in figure.



Figure 2-256: Satellite Imagery of Location ID 184

2.6.17 Location ID 185

ID 185 is located on N-120 near Tando Allahyar. It is a 4 lane divided Highway with width of each lane being 3.6 meters. Traffic from Hyderabad to Mirpur Khas is taken as North Bound whereas Traffic from Mirpur Khas to Hyderabad is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-257: Satellite Imagery of Location ID 185

2.6.18 Location ID 186

ID 186 is located on N-5 near Kalri Lake. It is a 4 lane divided Highway with width of each lane being 3.6 meters. Traffic from Thatta to Kotri is taken as North Bound whereas Traffic from Kotri to Thatta is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-258: Satellite Imagery of Location ID 186

2.6.19 Location ID 187

ID 187 is located on N-5 near Kotri. It is a 4 lane divided Highway with width of each lane being 3.6 meters. Traffic from Kotri to Hyderabad is taken as North Bound whereas Traffic from Hyderabad to Kotri is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-259: Satellite Imagery of Location ID 187

2.6.20 Location ID 188

ID 188 is located on Digri ~ Tando Bago Road near Tando Bago. It is a 2 lane divided Highway with width of each lane being 3.0 meters. Traffic from Tando Bago to Kotri is taken as North Bound whereas Traffic from Kotri to Tando Bago is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-260: Satellite Imagery of Location ID 188

2.6.21 Location ID 189

ID 189 is located on Tando Muhammad Khan ~ Mirpur Bathoro Road near Mirpur Bathoro. It is a 2 lane divided Highway with width of each lane being 3.0 meters. Traffic from Sujawal to Mirpur Bathoro is taken as North Bound whereas Traffic from Mirpur Bathoro to Sujawal is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-261: Satellite Imagery of Location ID 189

2.6.22 Location ID 190

ID 190 is located on Thatta ~ Sujawal road near Sujawal. It is a 2 lane Highway with width of each lane being 3.3 meters. Traffic from Sujawal to Thatta is taken as North Bound whereas Traffic from Thatta to Sujawal is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-262: Satellite Imagery of Location ID 190

2.6.23 Location ID 191

ID 191 is located on N-5 near Karachi. It is a 4 lane divided Highway with width of each lane being 3.6 meters. Traffic from Karachi to Thatta is taken as North Bound whereas Traffic from Thatta to Karachi is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-263: Satellite Imagery of Location ID 191

2.6.24 Location ID 192

ID 192 is located on Karachi ~ Hyderabad Motorway M-9 near Karachi. It is a 6 lane divided motorway with width of each lane being 3.6 meters. Traffic from Karachi to Hyderabad is taken as North Bound whereas Traffic from Hyderabad to Karachi is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-264: Satellite Imagery of Location ID 192

2.6.25 Location ID 193

ID 193 is located on N-25 near Hub. It is a 2 lanes highway with width of each lane being 3.6 meters. Traffic from Karachi to Hub is taken as North Bound whereas Traffic from Hub to Karachi is taken as South Bound. The satellite imagery is shown in figure.



Figure 2-265: Satellite Imagery of Location ID 193

2.7 Package – VI (Baluchistan)

All locations of Package – VI are located in Baluchistan Province of Pakistan. There are 25 locations as identified by the Client for 24-hours Traffic Counts and O-D Survey for package -VI. Figure shows all locations of Package - VI while details of locations are presented Table.

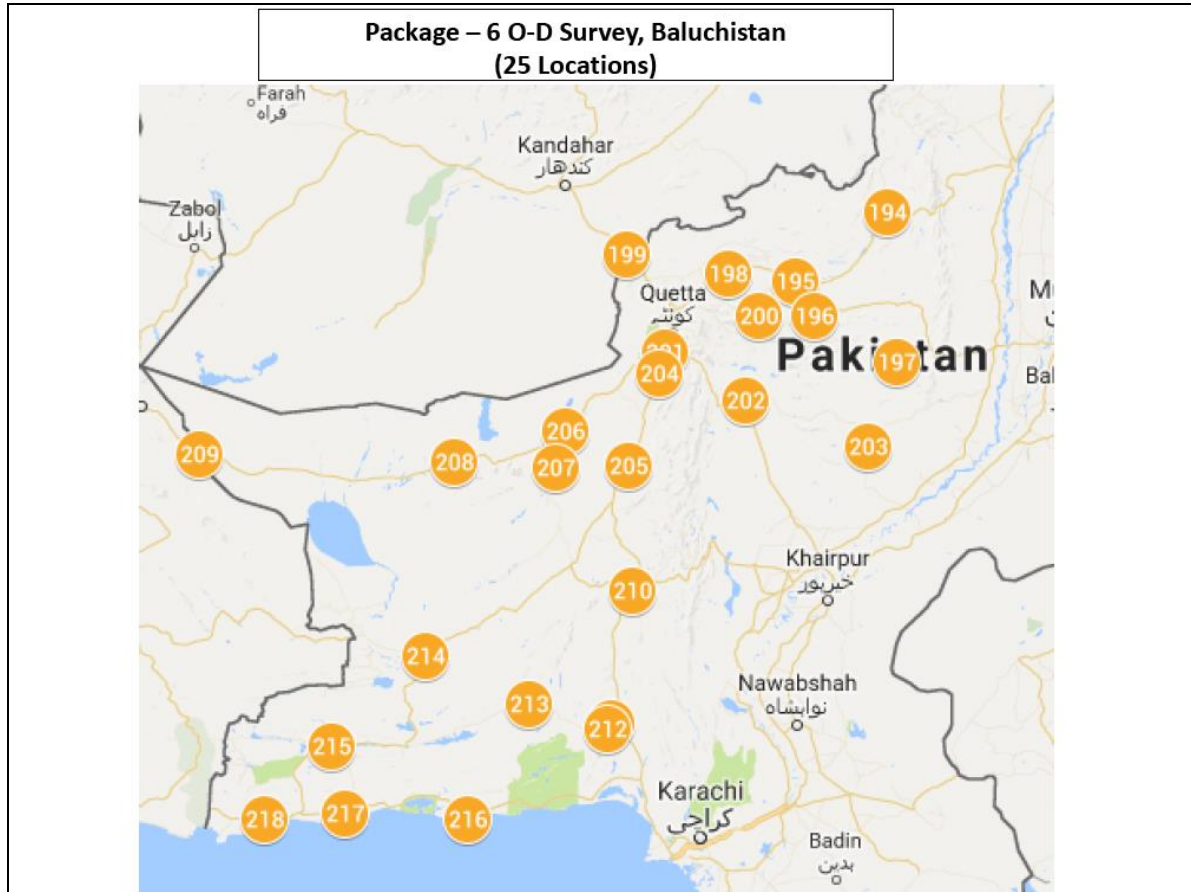


Figure 2-266: All Locations of Package - VI

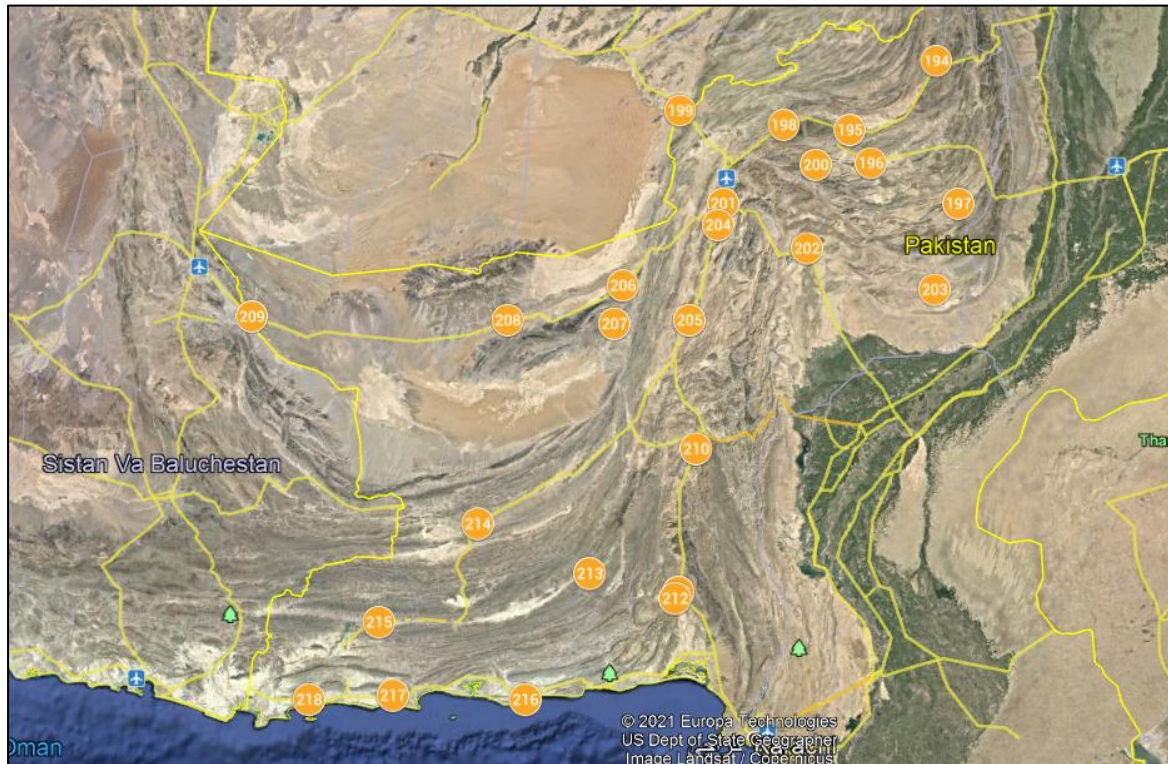


Figure 2-267: All Locations of Package - VI marked on Google Earth imagery

Table 4: Description of All Locations of Package-VI

O-D Survey Locations Package - VI (Baluchistan) Total 25 Locations					
S.No	ID	Location Description	S.No	ID	Location Description
1	194	Zhob - Wanna Road	14	207	Near Kharan
2	195	N-50 Near Qila Saifullah	15	208	N-40 Near Dalbandin
3	196	Sinjjawi Road (Sinjawai - Loralai)	16	209	N-40 (Pak-Afghan Border Taftan)
4	197	Rakni Road (Near Barkhan)	17	210	N-25 (Near Khuzdar)
5	198	N-50 (Muslim Bagh - Quetta)	18	211	N-25 (Khuzdar-Bela)
6	199	Pak-Afghan Border (Chaman)	19	212	Bela - Hoshab Road (Near Bela)
7	200	Loralai Road (Near Ziarat)	20	213	Bela - Hoshab Road (Near Awaran)
8	201	N-25 (Quetta - Mastung)	21	214	N-85 (Near Panjgur)
9	202	N-65 (Bolan Pass)	22	215	Mand Road (Near Turbat)
10	203	Sui Road (Near Dera Bugti)	23	216	N-10 (Malan - Ormara)
11	204	N-25 (Near Mastung)	24	217	N-10 (Near Pasni)
12	205	N-25 (Near Kalat)	25	218	N-10 (Near Gwadar)
13	206	N-40 (Quetta - Chagai)			

2.7.1 Location ID 194

Location ID 194 located on Zohb - Wana Road. It is 5 to 6 meters two lanes Carriageway which connects Zohb with Wana. Traffic going from Wana to Zohb is taken as North Bound NB. Traffic going from Zohb to Wana is taken as South Bound SB. Figure shows Location ID 194.

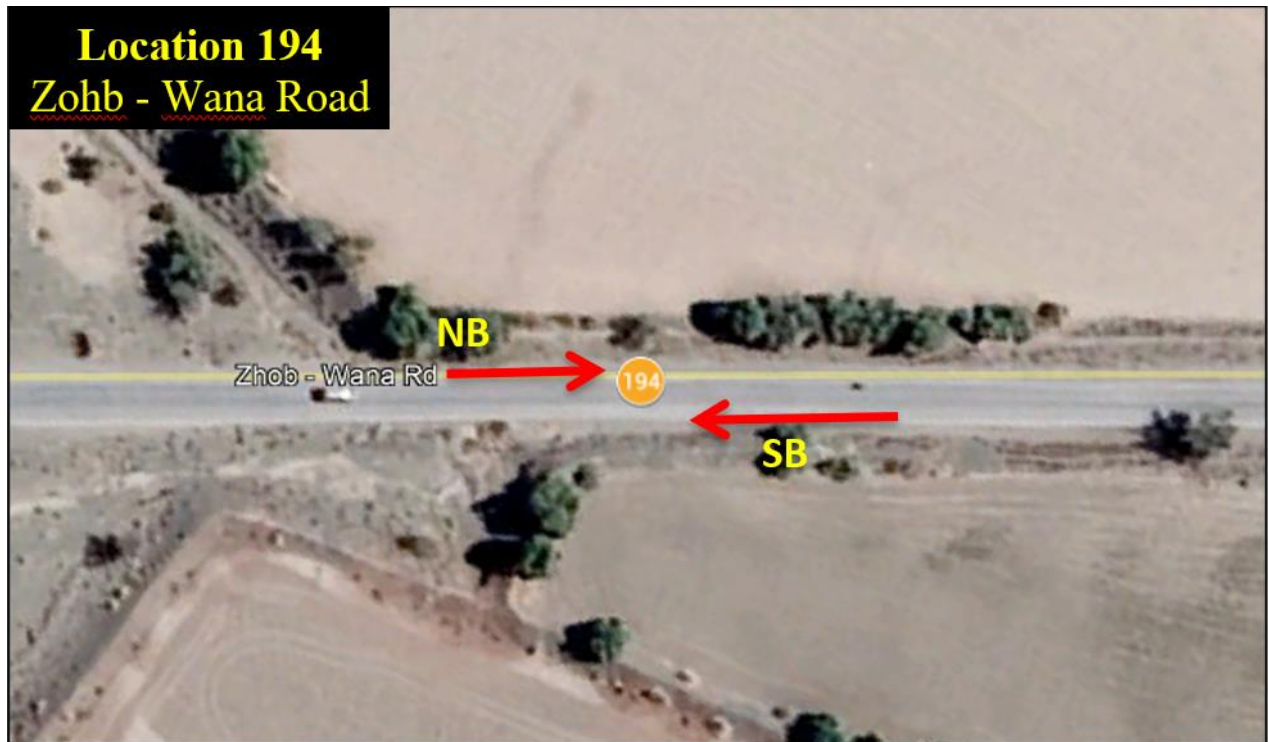


Figure 2-268: Satellite Image of Location ID 194

2.7.2 Location ID 195

Location ID 195 located on N-50 Kuchlak – Zhob Highway near Qilla Saifullah. National highway N-50 which starts from Kuchlak and ends at D.I Khan. Traffic going from Qilla Saifullah to Zhob is taken as North Bound NB. Traffic going from Zhob to Qilla Saifullah is taken as South Bound SB. Figure shows Location ID 195.



Figure 2-269: Satellite Image of Location ID 195

2.7.3 Location ID 196

Location ID 196 located on Sinjawai Road (Sinjawai – Loralai) Near Loralai. Location ID 196 connects Quetta/Ziarat with Loralai. Traffic going from Ziarat to Loralai is taken as North Bound NB. Traffic going from Loralai to Ziarat is taken as South Bound SB. Figure shows Location ID 196.

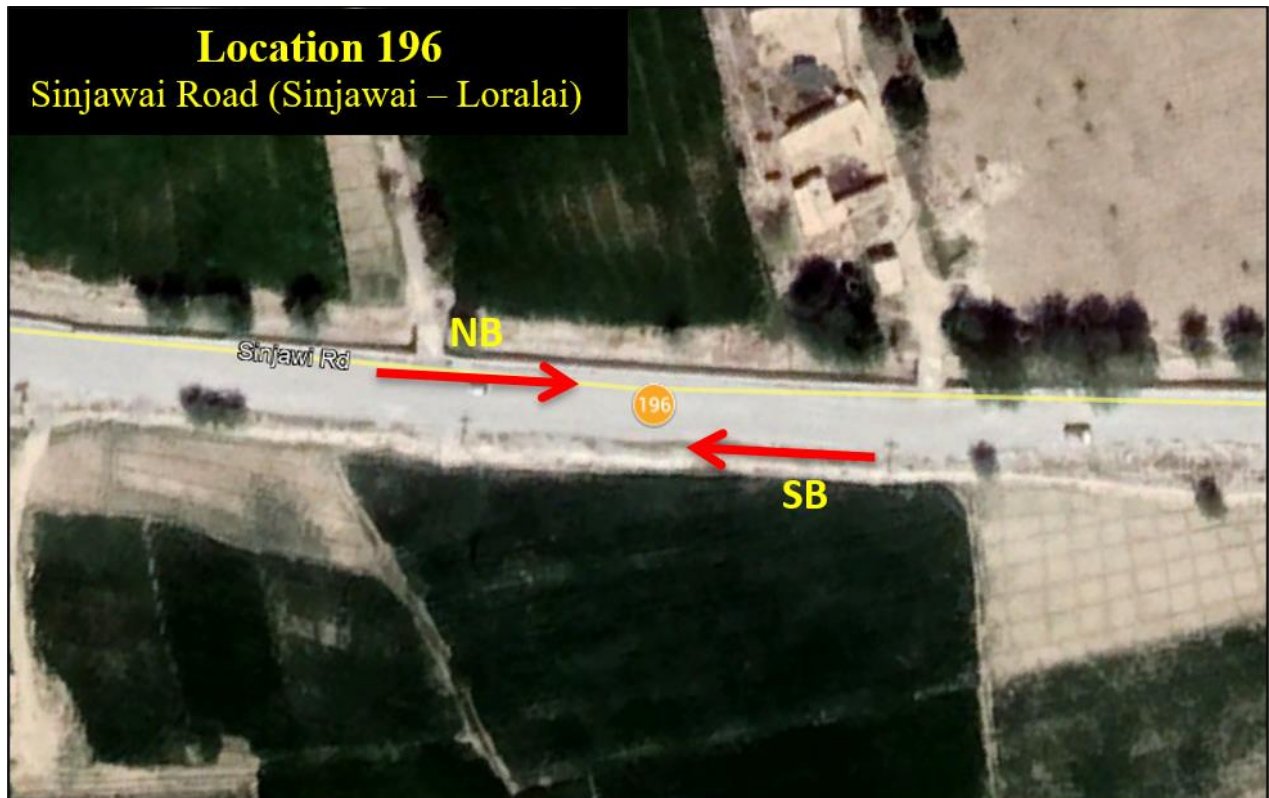


Figure 2-270: Satellite Image of Location ID 196

2.7.4 Location ID 197

Location ID 197 located on Rakni Road near Barkhan. It is 5 to 6 meters road. Traffic going from Dera Bugti to Barkhan is taken as North Bound NB. Traffic going from Barkhan to Dera Bugti is taken as South Bound SB. Figure shows satellite imagery of Location ID 197.

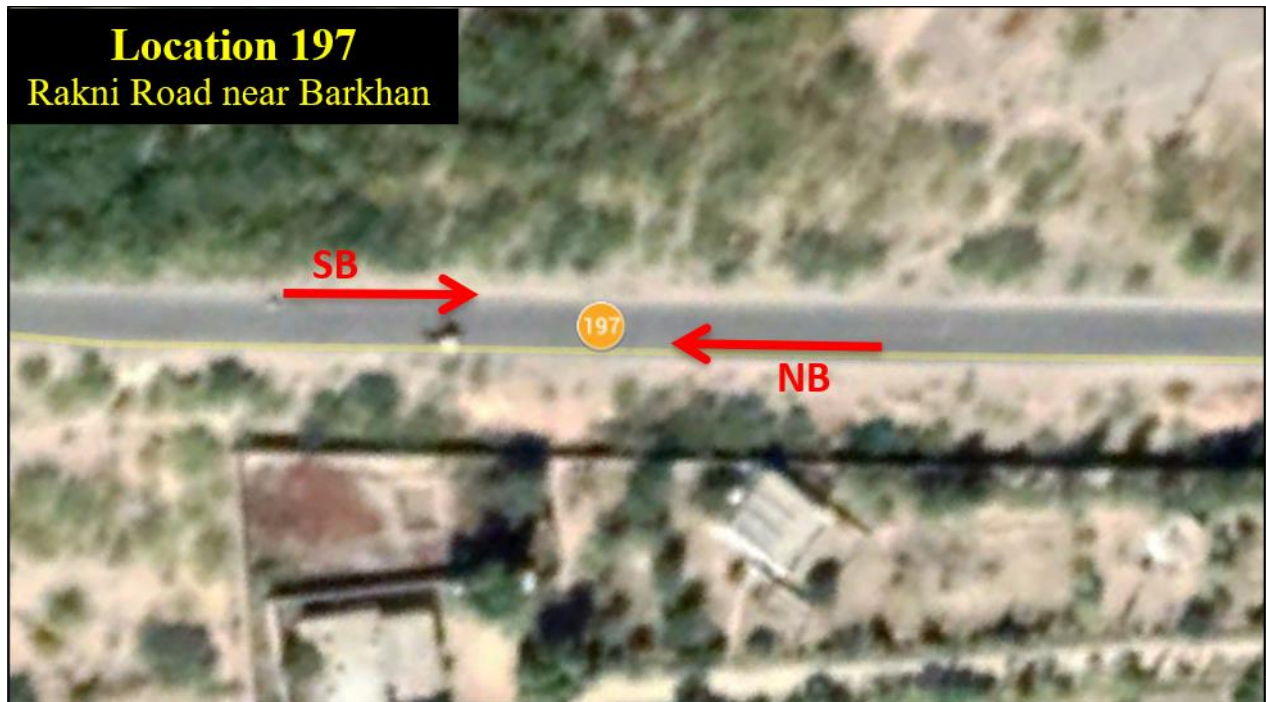


Figure 2-271: Satellite Image of Location ID 197

2.7.5 Location ID 198

Location ID 198 located on N-50 (Muslim Bagh – Quetta) near Muslim Bagh. Location ID 198 connects Muslim Bagh with Quetta. Traffic going from Qilla Saifullah to Quetta is taken as North Bound NB while the reverse is taken as South Bound SB. Figure shows Location ID 198.

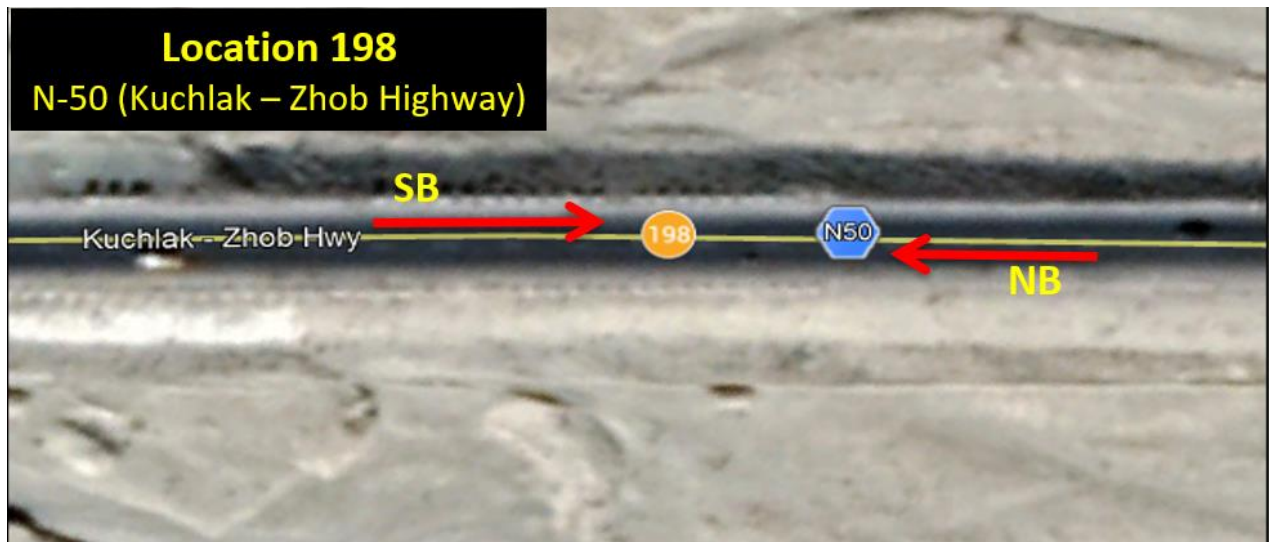


Figure 2-272: Satellite Image of Location ID 198

2.7.6 Location ID 199

Location ID 199 located on N-25 Pak-Afghan Border (Chaman). Location ID 199 connects Quetta with Chaman and Pak-Afghan Border. Traffic going from Quetta to Chaman is taken as North Bound NB. Traffic going from Chaman to Quetta is taken as South Bound SB. Figure shows Location ID 199.

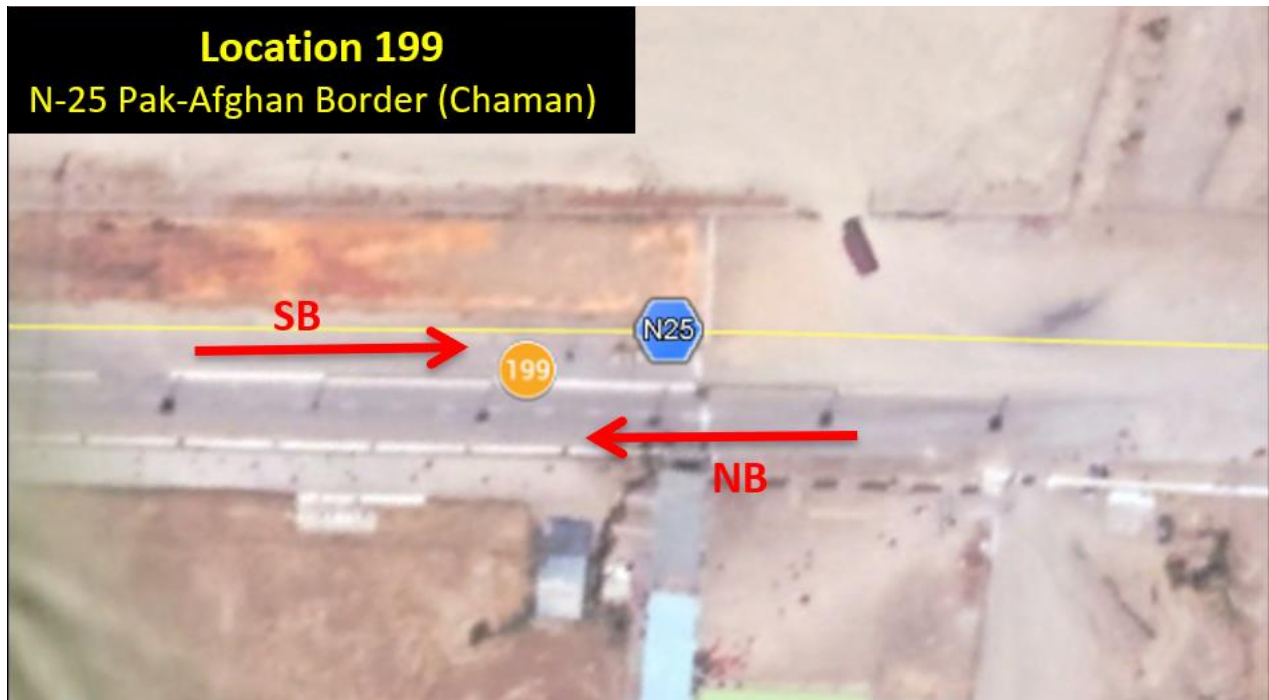


Figure 2-273: Satellite Image of Location ID 199

2.7.7 Location ID 200

Location ID 200 located on Loralai Road near Ziarat. It is 6 to 7 meters two lanes road which connects Loralai with Ziarat and further Quetta. Traffic going from Quetta to Loralai is taken as North Bound NB. Traffic going from Loralai to Quetta is taken as South Bound SB. Figure shows Location ID 200.



Figure 2-274: Satellite Image of Location ID 200

2.7.8 Location ID 201

Location ID 201 located on N-25 (Quetta – Mastung) also known as RCD (Regional Cooperation Development) Highway. Location ID 201 connects Mastung and Quetta. Traffic going from Mastung to Quetta is taken as North Bound NB. Traffic going from Quetta to Mastung is taken as South Bound SB. Figure shows Location ID 201.

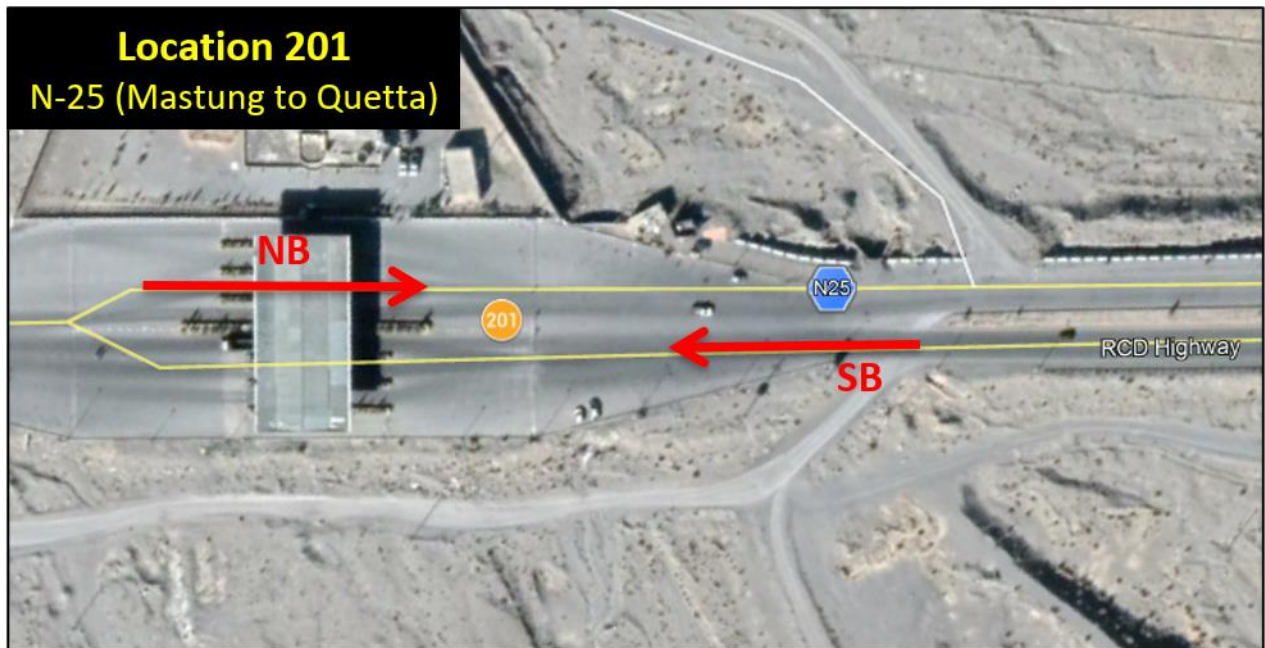


Figure 2-275: Satellite Image of Location ID 201

2.7.9 Location ID 202

Location ID 202 located on N-65 (Bolan Pass) also known as Quetta – Jaccobabad Highway. It is 9 to 10 meters National Highway. Location ID 202 connects Shikarpur with Dhadar. Traffic going from Jacobabad to Quetta is taken as North Bound NB. Traffic going from Quetta to Jacobabad is taken as South Bound SB. Figure shows Location ID 202.

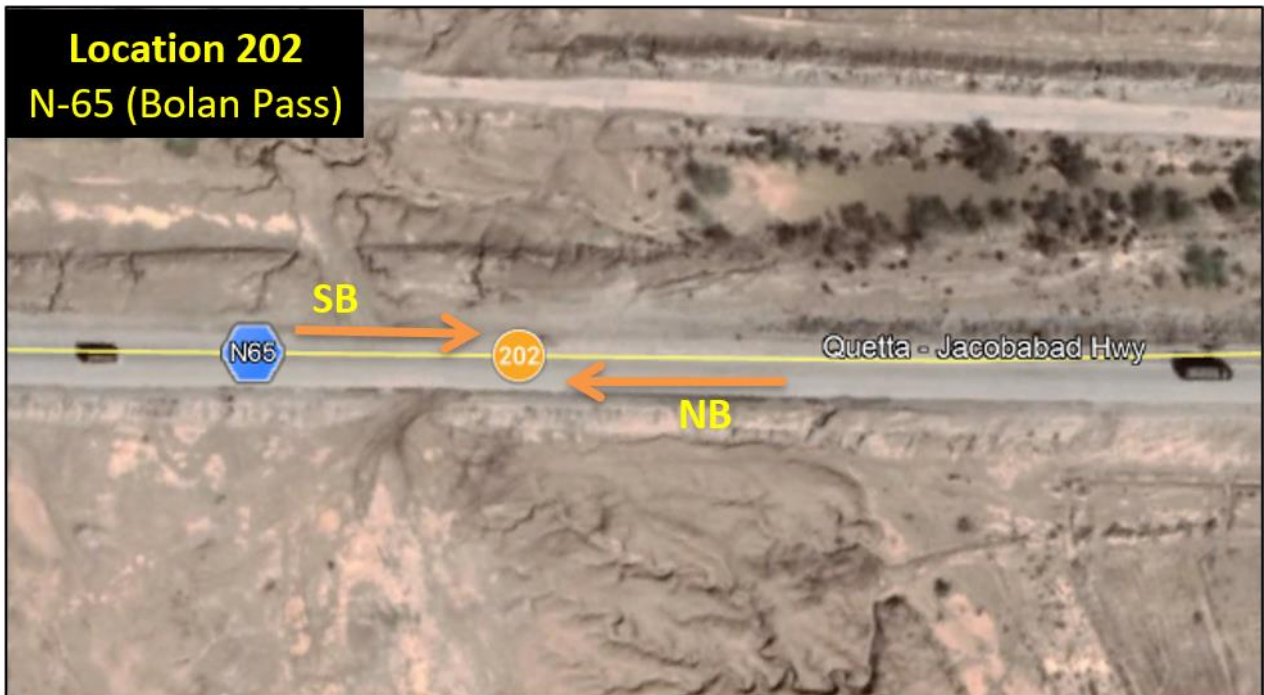


Figure 2-276: Satellite Image of Location ID 202

2.7.10 Location ID 203

Location ID 203 located on Sui Road near Dera Bugti. It is 4 to 5 meters road. Traffic going from Dera Bugti to Sui is taken as North Bound NB. Traffic going from Sui to Dera Bugti is taken as South Bound SB. Figure 2.12 shows Location ID 203.

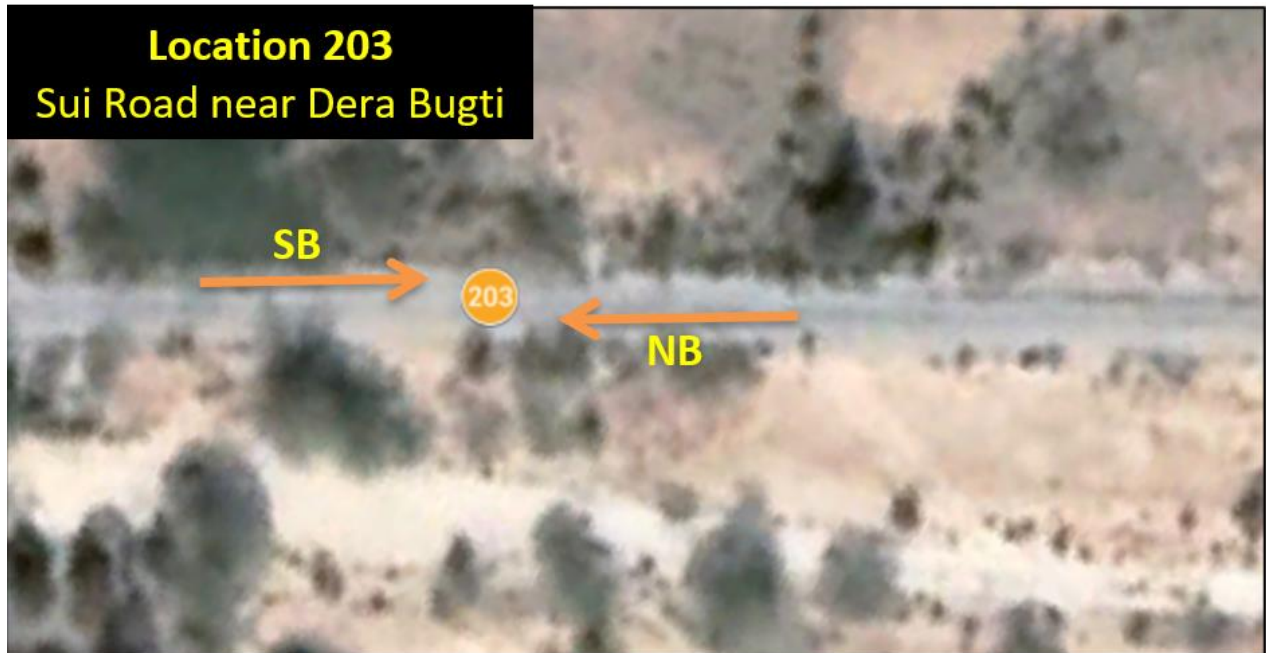


Figure 2-277: Satellite Image of Location ID 203

2.7.11 Location ID 204

Location ID 204 located on N-25 near Mastung. It is main National Highway also known as Regional Cooperation for Development Highway (RCD) which connects Khuzdar/Karachi with Quetta. Traffic going from Karachi to Quetta is taken as North Bound NB. Traffic going from Quetta to Kaachi/Khuzdar is taken as South Bound SB. Figure shows Location ID 204.



Figure 2-278: Satellite Image of Location ID 204

2.7.12 Location ID 205

Location ID 205 located on National Highway N-25 near Kalat. It is 11 to 12 meters Main National Highway. It connects Khuzdar with Quetta. Traffic going from Khuzdar to Quetta is taken as North Bound NB. Traffic going from Quetta to Khuzdar is taken as South Bound SB. Figure shows Location ID 205.



Figure 2-279: Satellite Image of Location ID 205

2.7.13 Location ID 206

Location ID 206 located on National Highway N-40 (Quetta - Chagai). It is 6.5 to 7.5 meters National Highway. Location ID 206 connects Nushki with Taftan. Traffic going from Nushki to Taftan is taken as North Bound NB. Traffic going from Taftan to Nushki is taken as South Bound SB. Figure shows Location ID 206.



Figure 2-280: Satellite Image of Location ID 206

2.7.14 Location ID 207

Location ID 207 located on Nushki - Kharan Road (Near Kharan). It is 3 to 4 meters road. It connects Nushki with Kharan. Traffic going from Nushki to Kharan is taken as North Bound NB. Traffic going from Kharan to Nushki is taken as South Bound SB. Figure shows Location ID 207.

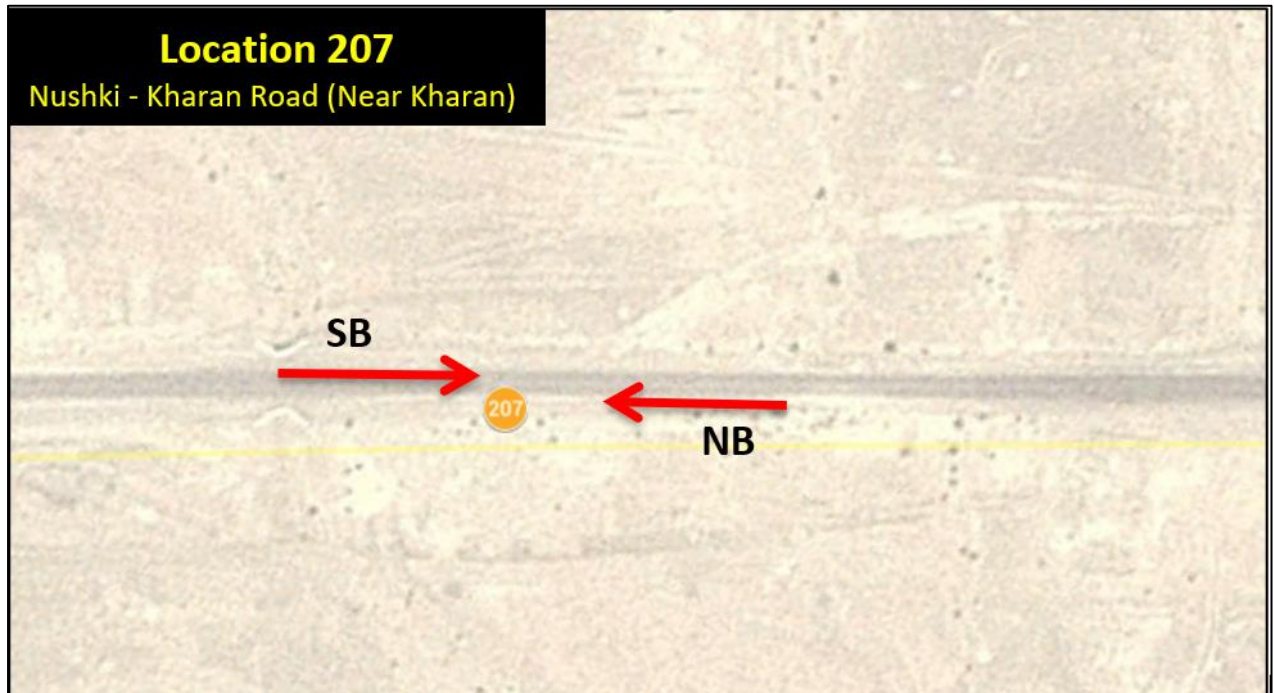


Figure 2-281: Satellite Image of Location ID 207

2.7.15 Location ID 208

Location ID 208 located on N-40 near Dalbandin. It connects Nushki with Balbandin and Zahedan. Traffic going from Nushki to Dalbandin is taken as North Bound NB. Traffic going from Dalbandin to Nushki is taken as South Bound SB. Figure shows Location ID 208.



Figure 2-282: Satellite Image of Location ID 208

2.7.16 Location ID 209

Location ID 209 located on Pak-Afghan Border, Taftan. It is a 2 lanes each side median separated National Highway. It connects Quetta with Taftan. Traffic going from Quetta to Taftan is taken as North Bound NB. Traffic going from Taftan to Quetta is taken as South Bound SB. Figure shows Location ID 209.

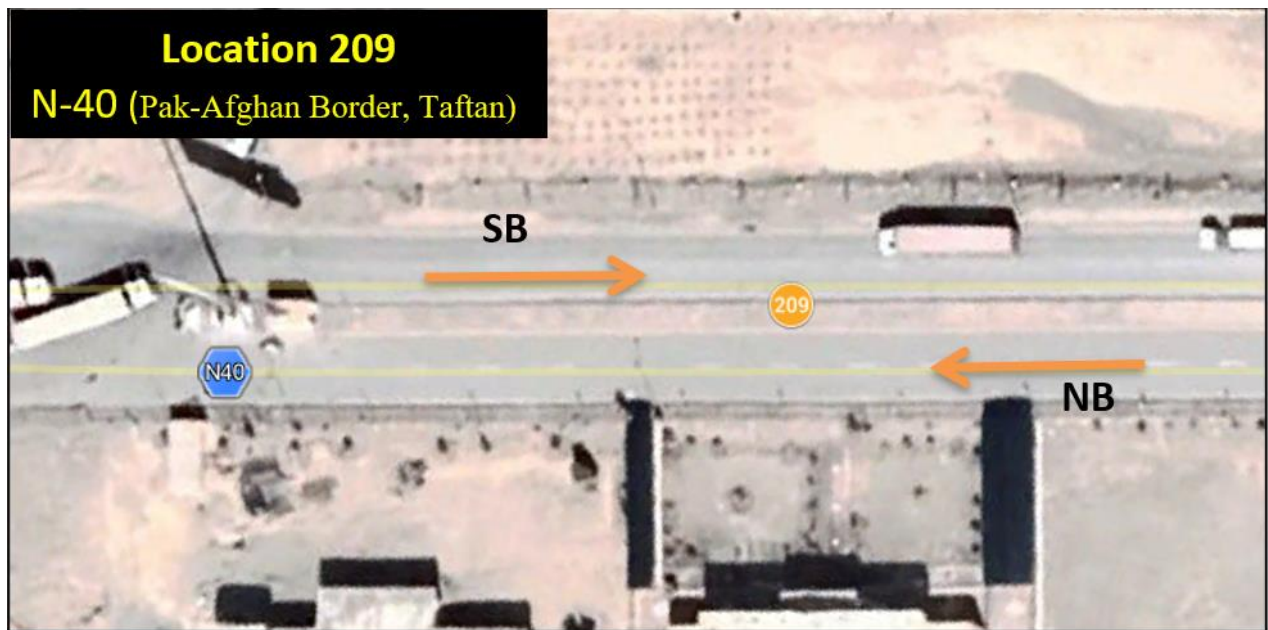


Figure 2-283: Satellite Image of Location ID 209

2.7.17 Location ID 210

Location ID 210 located on National Highway N-25 (RCD Highway) near Khuzdar. It is a 2 lanes National Highway. It connects Karachi with Quetta passing through Khuzdar and Qalat. Traffic going from Quetta to Karachi is taken as North Bound NB. Traffic going from Karachi to Quetta and Khuzdar is taken as South Bound SB. Figure shows Location ID 210.



Figure 2-284: Satellite Image of Location ID 210

2.7.18 Location ID 211

Location ID 211 located on National Highway N-25. It is a 7 to 8 meters National Highway. It connects Karachi with Quetta. Traffic going from Quetta to Karachi is taken as North Bound NB. Traffic going from Karachi to Quetta and Khuzdar is taken as South Bound SB. Figure shows Location ID 211.



Figure 2-285: Satellite Image of Location ID 211

2.7.19 Location ID 212

Location ID 212 located on Bela – Hoshab Road near Bela. It is 5 to 6 meters single carriageway. It connects Bela with Quetta. Traffic going from Quetta to Bela/Karachi is taken as North Bound NB. Traffic going from Bela/Karachi to Quetta is taken as South Bound SB. Figure shows satellite imagery of Location ID 212.



Figure 2-286: Satellite Image of Location ID 212

2.7.20 Location ID 213

Location ID 213 located on Bela – Hoshab Road near Awaran. It is 7 to 8 meters single carriageway. Location ID 213 connects Bela with Hoshab. Traffic going from Karachi/Bela to Awaran/Hoshab is taken as North Bound NB. Traffic going from Awaran/Hoshab to Karachi/Bela is taken as South Bound SB. Figure shows satellite imagery of Location ID 213.



Figure 2-287: Satellite Image of Location ID 213

2.7.21 Location ID 214

Location ID 214 located on N-85 Panjgur – Hoshab Highway near Panjgur. It is 8 to 9 meters National Highway. Location ID 214 connects Hoshab with Panjgur. Traffic going from Hoshab to Khuzdar is taken as North Bound NB while Traffic going from Khuzdar to Hohab is taken as South Bound SB. Figure shows Location ID 214.

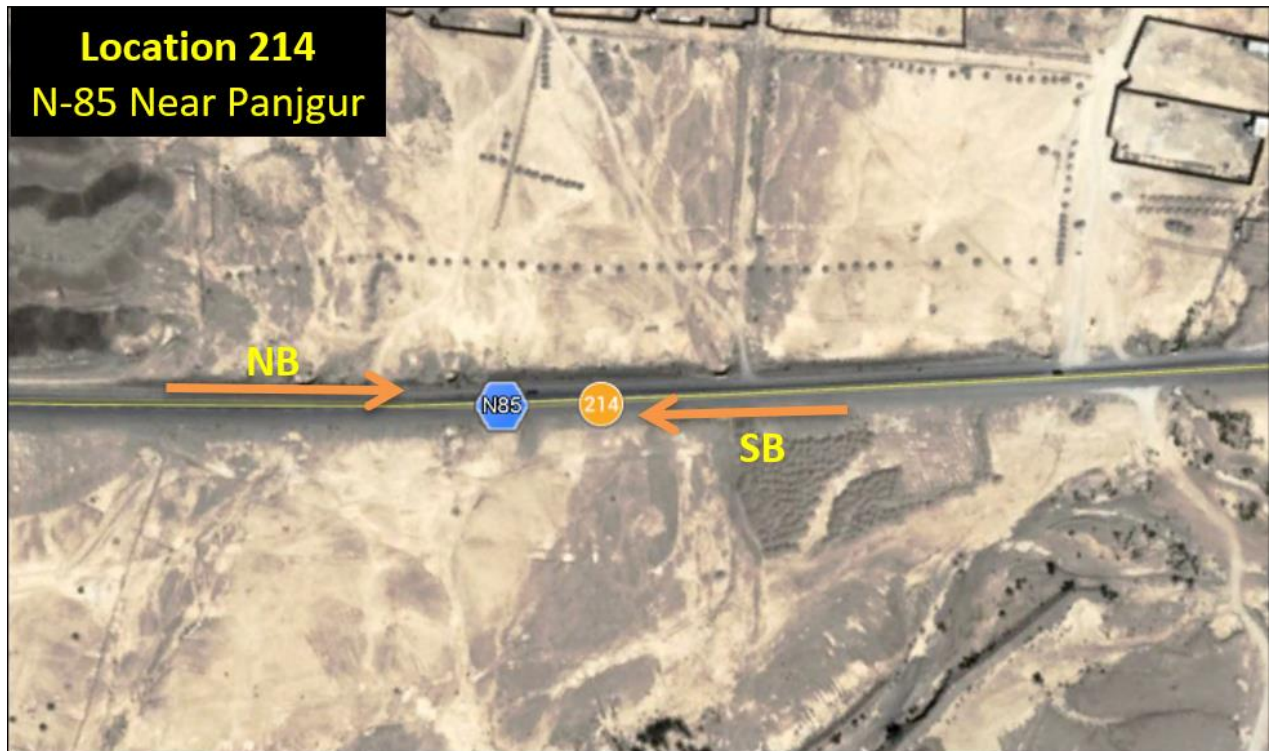


Figure 2-288: Satellite Image of Location ID 214

2.7.22 Location ID 215

Location ID 215 located on Mand Road near Turbat. It is a 6 to 7 meters road. Location 215 connects Turbat with Pasni and Pashin. Traffic going from Turbat to Pasni is taken as North Bound NB. Traffic going from Pasni to Turbat is taken as South Bound SB. Figure shows Location ID 215.

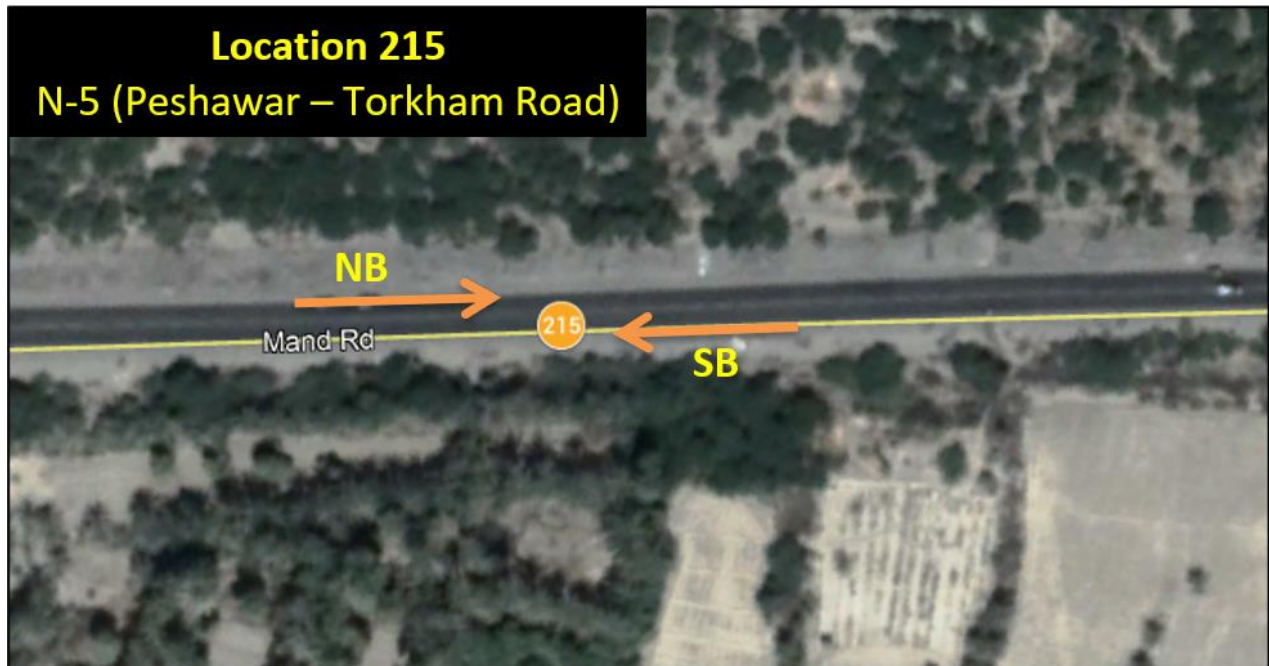


Figure 2-289: Satellite Image of Location ID 215

2.7.23 Location ID 216

Location ID 216 located on N-10 Makran Coastal Highway. It is a 5 to 6m road. Location ID 216 connects Ormara with Malan. Traffic going from Gwadra to Karachi is taken as North Bound NB while Traffic going from Karachi to Gwadar is taken as South Bound SB. Figure shows satellite imagery of Location ID 216.



Figure 2-290: Satellite Image of Location ID 216

2.7.24 Location ID 217

Location ID 217 located on N-10 Makran – Coastal Highway near Pasni. It is 7 to 8 meters two lanes single carriageway. Location ID 217 connects Pasni with Gwadar. Traffic going from Gwadar to Karachi is taken as North Bound NB. Traffic going from Karachi to Gwadar is taken as South Bound SB. Figure shows Satellite imagery of Location ID 217.

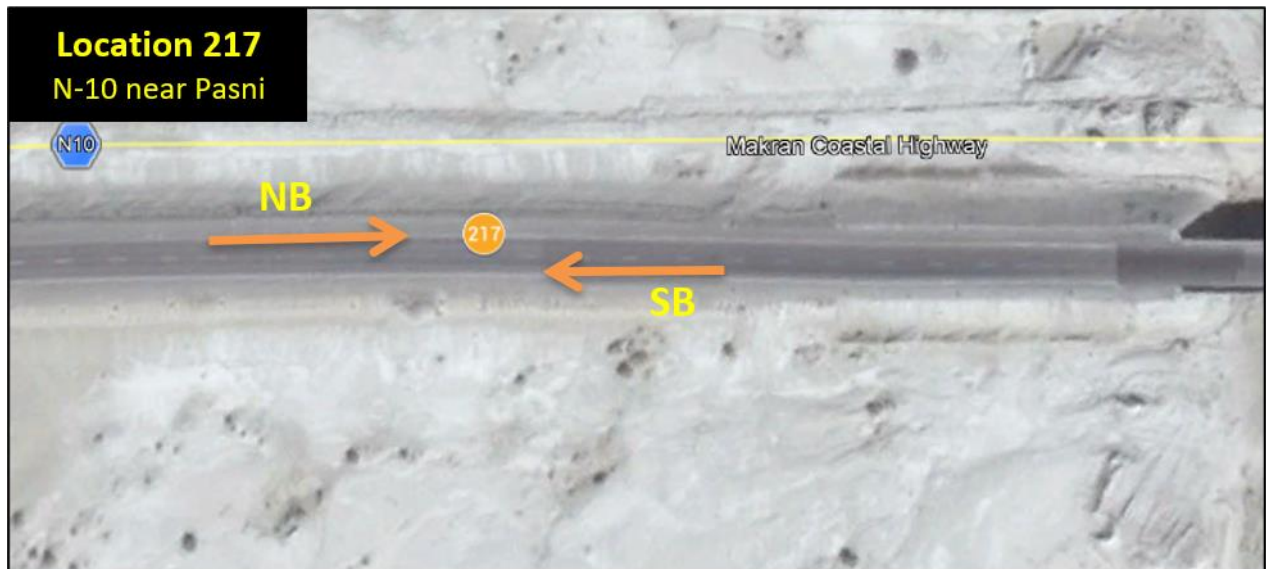


Figure 2-291: Satellite Image of Location ID 217

2.7.25 Location ID 218

Location ID 218 located on N-10 near Gwadar. It connects Gwadar with Pasni. Traffic going from Gwadar to Pasni is taken as North Bound NB while Traffic going from Pasni to Gwadar is taken as South Bound SB. Figure shows satellite imagery of Location ID 218.



Figure 2-292: Satellite Image of Location ID 218



3.0 METHODOLOGY FOR TRAFFIC COUNTS AND ORIGIN DESTINATION SURVEY

3.1 Traffic Counts

3.1.1 Introduction

Consultant has conducted the Detailed traffic counts for duration of 24 hours at all 218 locations as specified by the client. The counts were carried out to determine the sample size and average daily traffic volume (ADT). The 24 hours' traffic count was carried out along with the classification of vehicles.

3.1.2 Vehicle Classification and Type of Counts

The following is the classification of vehicles that had been surveyed.

- Car/Jeep/Taxi/Pickup/4WD
- Minibus/Medium Buses (up to 20 seats) Toyota Hiace Transit Vehicle with 12 to 18 seats)
- Large Bus (Over 20 seats)
- Pickup - Truck Open Back Single /Double Cabin
- 2-Axle truck (Rigid)
- 3-Axle truck (Rigid)
- Articulated Vehicles 4,5,6 or more Axles
- Agriculture Tractor/Trolley

<h2>Vehicle Classification for The Project</h2>	
<p>1) Car/Jeep/Taxi/Pickup/4WD</p> 	<p>5) 2- Axle Truck</p> 
<p>2) Mini Bus/Medium Buses (up to 20 seats) Toyota Hiace Transit Vehicle with 12 to 18 seats)</p> 	<p>6) 3-Axle Truck</p> 
<p>3) Large Buses</p> 	<p>7) Articulated Vehicles 4,5,6 or more Axles</p> 
<p>4) Pickup - Truck Open Back Single /Double Cabin</p> 	<p>8) Agriculture Tractor/Trolley</p> 

Figure 3-1: Vehicle Classification

3.1.3 Survey Equipment and Methodology

The consultant has used state of the art equipment to perform directional classified counts at all locations. The directional classified counts will be performed carried by using The Video Recording Units (VRU). VRU provides a high-definition video recording. Data will be extracted from there coded videos using software and as well as manually. It should be noted that all data which will be reported in this report is likely to be collected using VRU. Figure shows the snapshots of VRU used for this project.



Figure 3-2: Snapshots of VRU

3.2 Origin Destination (OD) Survey and Zones

3.2.1 Introduction

Origin-Destination O-D surveys were conducted to ascertain the road user information and necessary data collection in the study area. The O-D Surveys provide data regarding the origin and destination of each vehicle type travelling along the studied corridor. The O-D surveys information has been collected as sample surveys for passenger vehicles and freight vehicles for 24 hours at all 218 locations of 6 Packages.

3.2.2 Survey Methodology

3.2.2.1 Overview

For Origin Destination (O-D) Survey, it is essential that the survey staff should have appropriate training and qualification with respect to road safety, survey execution, understanding of survey. For O-D survey there were 2 survey teams, and each team consists of 12 members. O-D and Traffic counts were done on 2 locations at same time. Usually, 2 days are required for survey at each location. Survey was carried out on the first day and mobilization of the staff takes place on the next. O-D survey was carried out in 2 shifts. 6 members were assigned to each shift, 2 members were assigned on each side of the road for survey. The timing of each shift was 8 to 12 hours. The O-D survey was started at 7 AM in the morning and it ends after 24 hours. Two (2) Policemen were designated at each location to stop vehicles for O-D survey.

3.2.2.2 Sample Size

Origin-Destination (O-D) survey plays important role in determination / estimation of anticipated traffic on a transportation facility. This survey was carried out as sample based. Client had asked to cover 15% of total vehicles with 20% of freight passenger's coverage and 10% coverage for car passengers is required.

Each survey site was carefully located at such point that surveys was preferably be safely undertaken. Maximum effort would be made for consideration of sufficient space for vehicles to pull off the road on both sides. The sections of roads in the vicinity of the survey location adopted was preferably straight and flat, providing good visibility from a distance. Interviews was conducted with a random sample of drivers for each direction, corresponding roughly to the daylight hours.

3.2.2.3 Survey Vehicles


Since surveys was done at almost all locations of Pakistan, extensive traveling of survey staff was involved in the study. Comfortable vehicles able to sustain deteriorated road conditions such Toyota Hiace and/or Toyota Hilux Double cabin was hired.

3.2.2.4 Survey Method


Vehicles was flagged down randomly with the assistance of local government police, and the drivers was interviewed according to the interview item. It was ensured that this procedure do not make a long queue of the vehicles during the interview. After a vehicle was flagged down, it was ensured that the previous interview has already been taken.

3.2.2.5 Survey Questionnaire and Codes

Origin destination survey include detail information from single vehicle. So, detail survey form was designed separately for Cars and Heavy vehicles and for public transport separately. This information then further be converted in coded form. Codes were already defined by client NTRC. Figure 3.3 shows Origin Destination Survey Form for cars and heavy vehicle, Figure 3.4 shows the Origin Destination Survey Form for public transport and Table Shows the commodity Codes.



Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)



Surveyor Name: _____ Time Period: _____ Date: _____


Location: _____ Direction: _____ Day: _____

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle capacity	Loading Condition	Commodity Carried	Unit	Quantity
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												


Vehicle Type	1. Car/Jeep/Taxi/Pickup/4WD	Purpose for LTV Vehicles	Origin/Destination	1. Home	2. Work	3. Business	4. Education	5. Shopping	6. Recreational	7. Visit Relatives	8. Others	
	2. Pickup Truck Open Back Single/Double Cabin											
	3. 2-Axle Truck	Purpose for HTV Vehicles	Origin/Destination	1. Load	2. Unload	3. Load/Unload	4. Workshop & Others					
	4. 3-Axle Truck											
	5. 4-Axle and Above Truck											
	6. Tractor/ Trolley											

Supervisor Signature : _____

Figure 3-3: Origin Destination Survey Form for Cars and Heavy Vehicle



Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)



Surveyor Name: _____ Time Period: _____ Date: _____

Location: _____ Direction: _____ Day: _____

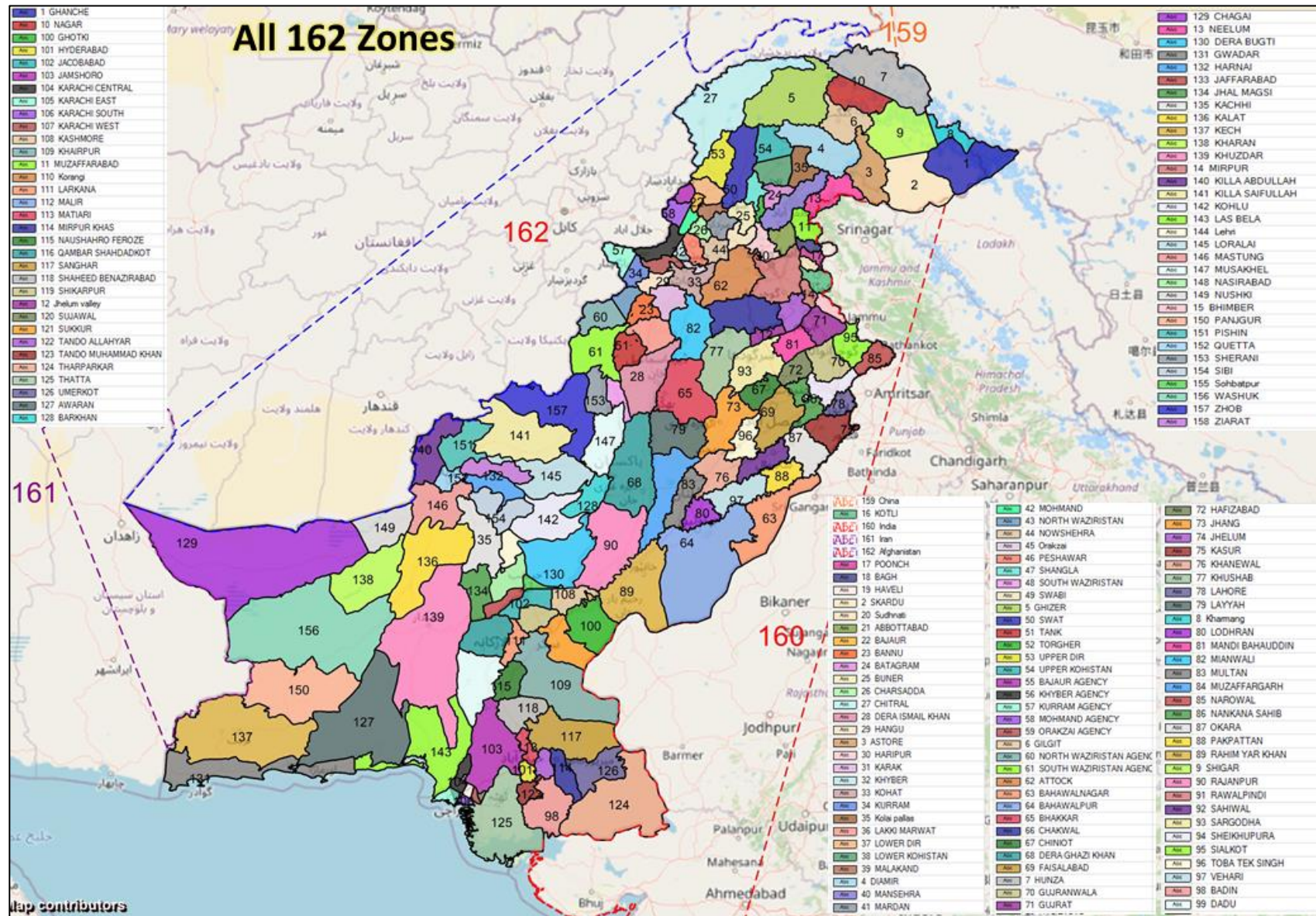
Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1								
2								
3								

Figure 3-4: Origin Destination Survey Form for Public Transport



3.3 Zoning

The study includes whole Pakistan, so the study area has been divided in to 162 Zones. All the districts of Pakistan are taken as a single zone. There are 158 internal zones and 4 external zone. Internal zones include all 158 districts of Pakistan. External zones include China, India, Iran and Afghanistan. Table shows all internal and external zones. **Error! Not a valid link. Error! Not a valid link.**Figure on next page shows all 162 zones of study area.



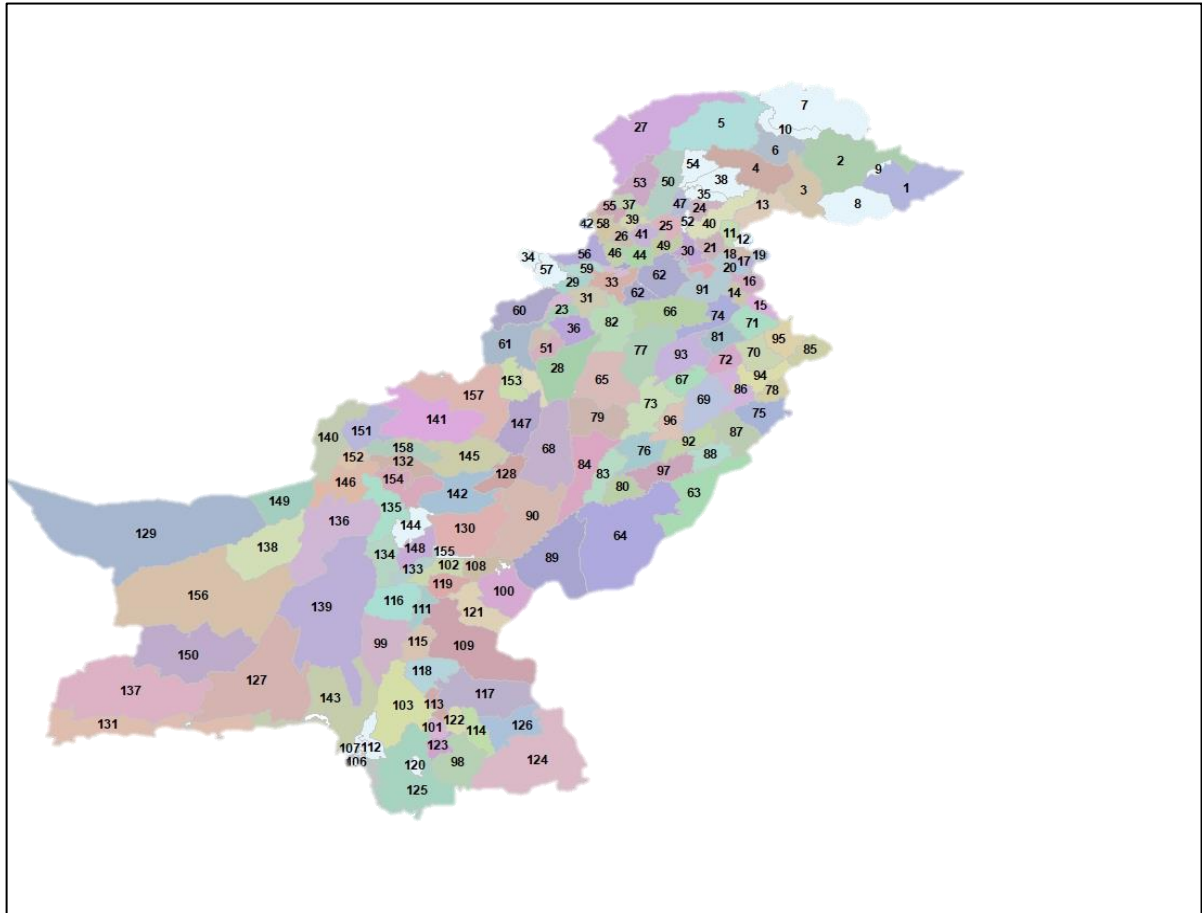


Figure: All Internal Zones

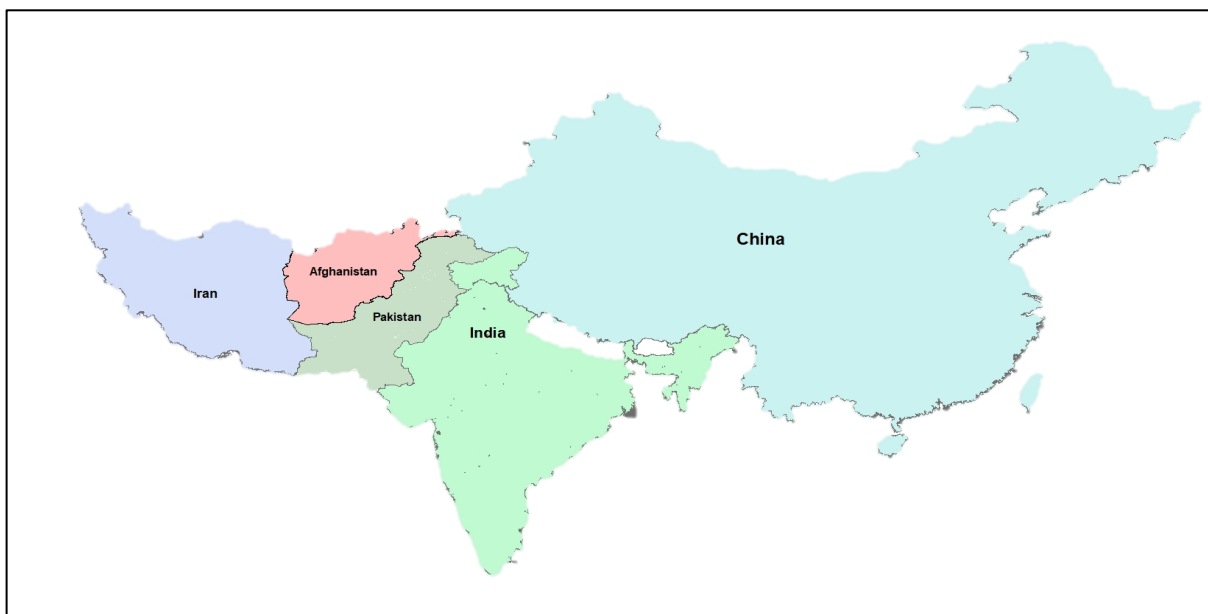


Figure: All External Zones

3.4 Commodity Codes

Commodity codes adopted for different items are presented in the following section.

Table 5: Commodity Codes

Code	Commodity	Code	Commodity
	AGR, FOOD, FISH, FOREST & L/STOCK PROD		MISCELLANEOUS MANUFACTURES
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	Motorcycle, 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	Generals 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
196	Other Agr. Products	595	Other misc. products n.s.e
198	Other animal products		
199	Other agr. Food, fish, forest, products		MINING AND QUARRYING
	RAW MATERIALS	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
	BULK MANUFACTURES	645	Other Metallic ores
		650	Other Mining & Quarrying
305	Cement		
310	Fertilizer		FUEL, LUBRICANTS (Mineral)
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
	BASIC MANUFACTURES	740	Lubricants
		745	Gas products Cylinders
405	Flour and its preparations including biscuit &...	750	Firewood, Charcoal
410	Industrial raw food (oils)	755	Misc. Fuel and Lubricants
415	Vegetable ghee and refined edible oil (processed)		MISC. GOODS NOT CLASSIFID
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,...	n.e.s.	Not Elsewhere Specified
465	Iron and steel – Billets, pipes, tubing's, girders, pig...		
470	Iron and steel finished products and other metal		
475	Cement manufactures concrete, slabs, sleepers, etc.		
480	Bricks and firebricks		
485	Other basic manufactures, n.e.s.		



3.4.1 Codes for all Vehicles

Type of Vehicles	Codes
Car/Jeep/Taxi/Pickup/4WD	1
Hiace	2
Minibus	3
Bus	4
Pickup Truck Open Back Single/ Double Cabin	5
2-Axle Truck	6
3-Axle Truck	7
4-Axle and Above Truck	8
Tractor/ Trolley	9

3.4.2 Codes for Origin/Destination Purposes for Cars, Minibuses, Large Buses and Hiace

Origin/Destination Purposes	Codes
Home	1
Work	2
Business	3
Education	4
Shopping	5
Recreational	6
Visit Relatives	7
Others	8

3.4.3 Codes for Origin/Destination Purposes for Heavy Vehicles

Origin/Destination Purposes	Codes
Load	1
Unload	2
Load/Unload	3
WorkShop	4

3.4.4 Codes for Heavy Vehicles Loading Condition

Heavy Vehicles Loading Condition	Codes
Empty	1
0.25	2
0.5	3
0.75	4

Heavy Vehicles Loading Condition	Codes
Full	5
20' Container	6
40' Container	7
60' Container	8

3.4.5 Vehicle Types

The following vehicles were surveyed:

- Car/Jeep/Taxi/Pickup/4WD
- Mini Bus/Medium Buses (un to 20seats) Toyota Hiace Transit Vehicle with 12 to 18 seats)
- Large Bus (Over 20 seats)
- Pickup - Truck Open Back Single /Double Cabin
- 2-Axle truck (Rigid)
- 3-Axle truck (Rigid)
- Articulated Vehicles 4,5,6 or more Axles
- Agriculture Tractor/Trolley

3.4.6 Interview Items

Interview items are as follows:

Vehicle Category	Interview items
(a) Car	Origin Location, Destination Location, Number of occupants, Trip purpose at origin and destination or at least at destination, Usage of expressway
(b) Minibuses/ Large Buses	Origin, Destination, Number of passengers, Usage of expressway
(c) Truck	Origin, Destination, Cargo type including break-bulk category. Tonnage of cargo, Usage of expressway

Origin and Destination includes the name of city (town or village), district, and province. The vehicle type of the interviews was recorded in accordance with the classification below:

Vehicle Category	Vehicle type
(a) Car	Passenger car, pick-up/van, taxi and 4-WD
(b) Bus	Minibus up to 20 Max, Large bus up to 40 Max.
(c) Truck	Pick-up truck, 2-axle truck, 3+-axle truck/dump/trailer, Container truck/trailer, Agriculture Tractor/Trolley

4.0 DATA COLLECTION AND ANALYSIS

4.1 Overview

The objective of the study was to assess the traffic impact on existing roads and identification of any other re-routing options available with the given resources as well as improvement plan, if required, to cater the existing traffic. Data was collected on all 218 locations in whole Pakistan. Collection of data includes classified counts and origin destination survey for 24 hours at the same time in 2 rounds i.e. Round-I and Round-II for all locations discussed above.

4.2 Coordination NHMP, Provincial Police, NHA

Detail coordination was required with the concerning departments to conduct Traffic count and Origin Destination survey on all 218 locations. At all 218 locations, some locations were located on NHA toll plazas, some locations were on Provincial highways of each province, some locations were on National Highways and some locations were on Motorway toll plazas. Letters were issued by client NTRC to the following departments. On the basis of these letters consultant met with the concerned focal persons of NHMP, NHA and Provincial Police. With the coordination of these departments consultant carried out their survey.

4.3 Package – I (AJK/GB)

4.3.1 Round – I

As discussed in previous section Classified traffic count and origin destination survey was done on all 27 locations as specified by Client NTRC for Package – I Round-I. Round-1 was done in the month of March and April 2019. Video recording unit (VRU) was used for classified counts as discussed and OD was performed by our OD team. Detail of Round-I Package-I is presented in the following table

OD Survey and Traffic Count Survey for Round-1 was done in March and April 2019.

Table 6: Traffic Counts/ OD Survey Data Collection Schedule for Package-I Round-1

O - D Data Collection Schedule for Package-1 Round-I					
Sr. No	Locations	Location ID	Road	Date	Days
1	Pak-China Border	1	N-35	16-04-2019	Tuesday



O - D Data Collection Schedule for Package-1 Round-I					
Sr. No	Locations	Location ID	Road	Date	Days
	(Khunjrab)				
2	Near Skardu	2	S-1	16-04-2019	Tuesday
3	Near Gilgit	3	N-35	17-04-2019	Thursday
4	N-15 Near Chilas	4	N-15	18-04-2019	Friday
5	N-35 (Dasu - Challas)	5	N-35	04-03-2019	Wednesday
6	Near Kalam	6	N-15	04-01-2019	Monday
7	Near Kaghan	7	N-15	04-04-2019	Thursday
8	N-90 (Besham - Khawezakhel)	8	N-90	04-03-2019	Wednesday
9	Near Chitral	9	N-45	04-02-2019	Tuesday
10	N-45 Near Dir	10	N-45	04-02-2019	Tuesday
11	N-95 Near Swat	11	N-95	04-01-2019	Monday
12	Near Mingora	12	N-45	04-01-2019	Monday
13	KP-6 (N-45 Chakdara to Dir)	13	N-45	04-02-2019	Tuesday
14	AJK Near Neelum	14	Neelum Valley Road	05-03-2019	Friday



O - D Data Collection Schedule for Package-1 Round-I					
Sr. No	Locations	Location ID	Road	Date	Days
15	AJK S-2 Near Muzaffarabad	15	Kohala-Muzaffarabad Road	05-02-2019	Thursday
16	AJK Muzaffarabad	16	Abbottabad Road	05-02-2019	Thursday
17	Mansehra-Talhatta Road (Manshra - Muzaffarabad)	17	Manshra - Muzaffarabad Road	04-04-2019	Thursday
18	N-35 Near Mansehra	18	N-35	04-04-2019	Thursday
19	AJK Near Hattian	19	Muzaffarabad-Chakothei Road	05-01-2019	Wednesday
20	N-35 Near Abbottabad	20	N-35	04-05-2019	Friday
21	Near Nathia Gali	21	Abbotabad Nathia Gali Road	04-05-2019	Friday
22	N-35 Near Havelian	22	N-35	04-05-2019	Friday
23	N-75 (Murree - Muzaffarabad)	23	Lower Topa-Kohala Road	30/4/2019	Tuesday
24	AJK Near Bagh	24	Ghazi Millat Road	30/4/2019	Tuesday
25	AJK Near Rawalakot	25	Bagh Highway	29/4/2019	Monday
26	AJK Near Azad Pattan	26	Azad Pattan Kohala Road	29/4/2019	Monday
27	Near Kotli AJK	27	Kotli Mirpur Road	29/4/2019	Monday

4.3.2 Round – II

Classified traffic count and origin destination survey was done on all 27 locations as specified by Client NTRC for Round – II Package -I. Round-2 was done in the month of June and July 2019. Video recording unit (VRU) was used for classified counts as discussed and OD was performed by our OD team. Details of Round-II Package-I is presented in the table below.

Table 7: Traffic Counts/ OD Survey Data Collection Schedule for Package-I Round-2

O - D Data Collection Schedule for Package-1 Round-II					
Sr. No	Locations	Location ID	Road	Date	Days
1	Pak-China Border (Khunjrab)	1	N-35	13-06-2019	Thursday
2	Near Skardu	2	S-1	15-06-2019	Saturday
3	Near Gilgit	3	N-35	14-06-2019	Friday
4	N-15 Near Chilas	4	N-15	16-06-2019	Sunday
5	N-35 (Dasu - Challas)	5	N-35	17-06-2019	Monday
6	Near Kalam	6	N-15	19-06-2019	Wednesday
7	Near Kaghan	7	N-15	02-07-2019	Tuesday
8	N-90 (Besham - Khawezakhel)	8	N-90	17-06-2019	Monday
9	Near Chitral	9	N-45	24-06-2019	Monday
10	N-45 Near Dir	10	N-45	24-06-2019	Monday
11	N-95 Near Swat	11	N-95	19-06-2019	Wednesday



O - D Data Collection Schedule for Package-1 Round-II					
Sr. No	Locations	Location ID	Road	Date	Days
12	Near Mingora	12	N-45	21-06-2019	Friday
13	KP-6 (N-45 Chakdara to Dir)	13	N-45	21-06-2019	Friday
14	AJK Near Neelum	14	Neelum Valley Road	Cancelled	Firing at LOC
15	AJK S-2 Near Muzaffarabad	15	Kohala-Muzaffarabad Road	01-07-2019	Monday
16	AJK Muzaffarabad	16	Abbottabad Road	01-07-2019	Monday
17	Mansehra-Talhatta Road (Manshra - Muzaffarabad)	17	Manshra - Muzaffarabad Road	28-07-2019	Friday
18	N-35 Near Mansehra	18	N-35	28-07-2019	Friday
19	AJK Near Hattian	19	Muzaffarabad-Chakothei Road	04-07-2019	Thursday
20	N-35 Near Abbottabad	20	N-35	26-06-2019	Wednesday
21	Near Nathia Gali	21	Abbotabad Nathia Gali Road	09-07-2019	Tuesday
22	N-35 Near Havelian	22	N-35	26-06-2019	Wednesday
23	N-75 (Murree - Muzaffarabad)	23	Lower Topa-Kohala Road	09-07-2019	Tuesday
24	AJK Near Bagh	24	Ghazi Millat Road	05-07-2019	Friday

O - D Data Collection Schedule for Package-1 Round-II					
Sr. No	Locations	Location ID	Road	Date	Days
25	AJK Near Rawalakot	25	Bagh Highway	05-07-2019	Friday
26	AJK Near Azad Pattan	26	Azad Pattan Kohala Road	06-07-2019	Saturday
27	Near Kotli AJK	27	Kotli Mirpur Road	11/07/2019	Tuesday

4.4 Package – II (FATA + KPK)

4.4.1 Round – I

Classified traffic count and origin destination survey was performed on all 36 locations as specified by Client NTRC. Round-1 was done in April 2019 to May 2019. For FATA Round-1 was conducted in the month of September 2019. Video recording unit (VRU) was used for classified counts as discussed and OD was performed by our OD team.

Table 8: Traffic Counts/ OD Survey Data Collection Schedule for Package-II Round-1

Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-1					
Sr. No	Locations	Location ID	Road	Date	Day
1	N-50 (D.I.Khan - Zhob)	61	N-50	26/3/2019	Tuesday
2	Near Tank	63	Tank-DI Khan Road	26/3/2019	Tuesday
3	N-55 Near Lakki Marwat	56	N-55	26/3/2019	Tuesday
4	Essa Khel Mianawali Road (Isa Khel - Lakki)	57	Issa Khel Mianwali Road	26/3/2019	Tuesday
5	Near Bannu	55	Banu Road	27/3/2019	Wednesday



Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-1					
Sr. No	Locations	Location ID	Road	Date	Day
6	N-55 (Karak - Bannu)	58	N-55 Karak Bannu Road	27/3/2019	Wednesday
7	Bannu to Miran Shah Road	54	Bannu Miran Shah Road	27/3/2019	Wednesday
8	Kohat Fateh Jang Road (Kushargarh Bridge)	43	Kohat Fateh Jang Road	28/3/2019	Thursday
9	N-55 (Peshawar - Kohat)	44	N-55 Peshawar Kohat Road	28/3/2019	Thursday
10	N-80 Near Kohat	45	N-80 Kohat Fateh Jang Road	28/3/2019	Thursday
11	Near Hangu	53	Thall Hangu Road	28/3/2019	Thursday
12	Pak-Afghan Border (Torkham)	49	Peshawar Torkham Road	29/3/2019	Friday
13	M-1 Motorway Toll Plaza at Peshawar (NB/SB)	42	Islamabad Peshawar Motorway	29/3/2019	Friday
14	KP-2 (Charsadda Road)	41	Charsadda Road	29/3/2019	Friday
15	M-1 Rashakai Interchange (NB/SB)	37	Islamabad Peshawar Motorway	30/3/2019	Saturday
16	KP-4 (Charsadda - Mardan Road)	38	Charsadda - Mardan Road	30/3/2019	Saturday
17	N-45 (Mardan - Malakand)	40	N-45 Mardan Malakand Road	30/3/2019	Saturday
18	M-1 Jehangira Interchange	32	Islamabad Peshawar	8/4/2019	Monday



Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-1					
Sr. No	Locations	Location ID	Road	Date	Day
	(NB/SB)		Motorway		
19	Near Swabi	33	Swabi Road	8/4/2019	Monday
20	Near Topi	28	Swabi Topi Road	8/4/2019	Monday
21	KP-5 (Swabi -Jahangira Road)	36	Swabi -Jahangira Road	9/4/2019	Tuesday
22	N-5 (Attock -Nowshera)	39	N-5	9/4/2019	Tuesday
23	N-35 (Hassanabdal - Haripur)	29	N-35	10/4/2019	Wednesday
24	M-1 Burhan Interchange (NB/SB)	30	Islamabad Peshawar Motorway	11/4/2019	Thursday
25	N-5 (Taxila -Burhan)	31	N-5	11/4/2019	Thursday
26	Ghazi Road (Haripur - Swabi)	34	Haripur - Swabi Road	10/4/2019	Wednesday
27	BKP-1 (Hattar - Haripur)	35	Hattar - Haripur Road	10/4/2019	Wednesday
28	FATA Bajaur Agency	46	Bajur Road	7/9/2019	Saturday
29	FATA Mohmand Agency	47	Mohmand Agency Road	8/9/2019	Sunday
30	KP-3 (Mohmand Agency Road)	48	Mohmand Agency Road	6/9/2019	Friday
31	FATA Khyber Agency	50	Khyber Agency Road	5/9/2019	Thursday

Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-1					
Sr. No	Locations	Location ID	Road	Date	Day
32	FATA Orkzai Agency	51	Orkzai Agency Road	4/9/2019	Wednesday
33	FATA Near Parachinar	52	Parachinar Road	2/9/2019	Monday
34	FATA North Waziristan Agency	59	North Waziristan Road	30/8/2019	Friday
35	Makin Road (Razmak - Tanaei)	60	Razmak Tanai Road	27/8/2019	Tuesday
36	FATA Near Wana	62	Wana Road	28/8/2019	Wednesday

4.4.2 Round – II

Classified traffic count and origin destination survey was performed on all 36 locations as specified by Client NTRC. Round-2 was done in June 2019 to July 2019. Survey of 9 locations of FATA was cancelled due to security reasons. Video recording unit (VRU) was used for classified counts as discussed and OD was performed by our OD team.

OD Survey and Traffic Count Survey for Round-2 was performed in June 2019 to July 2019.

Table 9: Traffic Counts/ OD Survey Data Collection Schedule for Package-II Round-2

Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-2					
Sr. No	Locations	Location ID	Road	Date	Days
1	N-50 (D.I.Khan - Zhob)	61	N-50	27/06/2019	Thursday
2	Near Tank	63	Tank-DI Khan Road	27/06/2019	Thursday
3	N-55 Near Lakki	56	N-55	27/06/2019	Thursday



Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-2					
Sr. No	Locations	Location ID	Road	Date	Days
	Marwat				
4	Essa Khel Mianawali Road (Isa Khel - Lakki)	57	Issa Khel Mianwali Road	27/06/2019	Thursday
5	Near Bannu	55	Banu Road	28/06/2019	Friday
6	N-55 (Karak - Bannu)	58	N-55 Karak Bannu Road	28/06/2019	Friday
7	Bannu to Miran Shah Road	54	Bannu Miran Shah Road	28/06/2019	Friday
8	Kohat Fateh Jang Road (Kushargarh Bridge)	43	Kohat Fateh Jang Road	29/06/2019	Saturday
9	N-55 (Peshawar - Kohat)	44	N-55 Peshawar Kohat Road	29/06/2019	Saturday
10	N-80 Near Kohat	45	N-80 Kohat Fateh Jang Road	29/06/2019	Saturday
11	Near Hangu	53	Thall Hangu Road	29/06/2019	Saturday
12	Pak-Afghan Border (Torkham)	49	Peshawar Torkham Road	01/07/2019	Monday
13	M-1 Motorway Toll Plaza at Peshawar (NB/SB)	42	Islamabad Peshawar Motorway	01/07/2019	Monday
14	KP-2 (Charsadda Road)	41	Charsadda Road	01/07/2019	Monday
15	M-1 Rashakai Interchange (NB/SB)	37	Islamabad Peshawar Motorway	02/07/2019	Tuesday



Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-2					
Sr. No	Locations	Location ID	Road	Date	Days
16	KP-4 (Charsadda - Mardan Road)	38	Charsadda - Mardan Road	02/07/2019	Tuesday
17	N-45 (Mardan - Malakand)	40	N-45 Mardan Malakand Road	02/07/2019	Tuesday
18	M-1 Jehangira Interchange (NB/SB)	32	Islamabad Peshawar Motorway	03/07/2019	Wednesday
19	Near Swabi	33	Swabi Road	03/07/2019	Wednesday
20	Near Topi	28	Swabi Topi Road	03/07/2019	Wednesday
21	KP-5 (Swabi - Jahangira Road)	36	Swabi -Jahangira Road	03/07/2019	Wednesday
22	N-5 (Attock - Nowshera)	39	N-5	04/07/2019	Thursday
23	N-35 (Hassanabdal - Haripur)	29	N-35	05/07/2019	Friday
24	M-1 Burhan Interchange (NB/SB)	30	Islamabad Peshawar Motorway	04/07/2019	Thursday
25	N-5 (Taxila -Burhan)	31	N-5	04/07/2019	Thursday
26	Ghazi Road (Haripur - Swabi)	34	Haripur - Swabi Road	05/07/2019	Friday
27	BKP-1 (Hattar - Haripur)	35	Hattar - Haripur Road	05/07/2019	Friday
28	FATA Bajaur Agency	46	Bajaur Road	Survey Cancelled	Survey Cancelled



Traffic Counts/ OD Survey Data Collection Schedule for Package-2 Round-2					
Sr. No	Locations	Location ID	Road	Date	Days
29	FATA Mohmand Agency	47	Mohmand Agency Road	Survey Cancelled	Survey Cancelled
30	KP-3 (Mohmand Agency Road)	48	Mohmand Agency Road	Survey Cancelled	Survey Cancelled
31	FATA Khyber Agency	50	Khyber Agency Road	Survey Cancelled	Survey Cancelled
32	FATA Orkzai Agency	51	Orkzai Agency Road	Survey Cancelled	Survey Cancelled
33	FATA Near Parachinar	52	Parachinar Road	Survey Cancelled	Survey Cancelled
34	FATA North Waziristan Agency	59	North Waziristan Road	Survey Cancelled	Survey Cancelled
35	Makin Road (Razmak - Tanai)	60	Razmak Tanai Road	Survey Cancelled	Survey Cancelled
36	FATA Near Wana	62	Wana Road	Survey Cancelled	Survey Cancelled

4.5 Package – III (PUNJAB - 1)

4.5.1 Round – I

OD Survey and Traffic Count for Round-1 was done in December 2018 to February 2019.

Table 10: Traffic Counts/ OD Survey Data Collection Schedule for Package-III Round-1

TRAFFIC COUNTS/ OD SURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – III ROUND -1				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
1	CHAPER BISMILLAH HOTEL	64	RAWAT ~ KALLAR SYEDAN	26/12/2018
2	PHULGRAN TOLL PLAZA	65	N75	14/02/2019
3	TOLL PLAZA	66	N80	15/02/2019
4	KAHUTA ROAD	67	KAHUTA ROAD	26/12/2018
5	ISLAMABAD PESHAWER TOLL PLAZA	68	M 1	16/02/2019
6	MANDRA TOLL PLAZA	69	N-5	26/12/2018
7	CHAKRI TOLL PLAZA	70	M 2	16/02/2019
8	ATTOCK PETROL PUMP	71	TALAGANG - DHULLIAN ROAD	16/02/2019
9	BALKASAR TOLL PLAZA	72	M 2	15/02/2019
10	SHELL PUMP	73	MANDRA CHAKWAL ROAD	27/12/2018
11	KALLAR KAHAR TOLL PLAZA	74	M 2	15/02/2019
12	LILLAHTOLL PLAZA	75	M 2	15/02/2019
13	MIAN NASEER PETROL PUMP	76	TOBA GOJRA ROAD	17/01/2019
14	BHERA TOLL PLAZA	77	M 2	14/02/2019
15	SALAM TOLL PLAZA	78	M 2	14/02/2019
16	MAKHDOM INTERCHANGE	79	M 2	14/02/2019
17	KOT SARWAR TOLL PLAZA	80	M 2	02/12/2019
18	KOLI FAQEER	81	JHANG FAISALABAD ROAD	11/01/2019
19	KHANQA DOGRAN TOLL PLAZA	82	M 2	12/02/2019
20	SHEIKHUPURA TOLL PLAZA	83	M 2	12/02/2019
21	KALA SHAH KAKU TOLL PLAZA	84	M 2	02/12/2018
22	D I KHAN ROAD	85	D I KHAN ROAD	09/01/2019
23	QUALITY 1 PUMP	86	TOBA TO SHORKOT RD	17/01/2019
24	FAIZPUR TOLL PLAZA	87	M 2	11/02/2019
25	BABU SABU TOLL PLAZA	88	M2	09/02/2019
26	RAVI TOLL PLAZA	89	M2	08/02/2019
27	FAKHRABAD TOLL PLAZA	90	TALAGANG TO MIANWALI	07/01/2019
28	PSO PUMP	91	TALAGANG ROAD	07/01/2019
29	ATTOCK PETROL PUMP	92	KALAR KAHAR ROAD	07/01/2019
30	SARGODA BHALWAL ROAD	93	SARGODA BHALWAL ROAD	12/01/2019
31	CHENAB TOLL PLAZA	94	N 5	29/12/2018
32	ASKHAR PUMP MURAD WALA	95	LAHORE ROAD	11/01/2019
33	SHAHKOT TO SHEIKHUPURA	96	FAISALABAD ~ SHEIKHUPURA	14/01/2019
34	MAKKUANA TOLL PLAZA	97	FAISALABAD ROAD	12/01/2019
35	POLICE CHECK POST MARI MANDI	98	OKARA FAISALABAD ROAD	16/01/2019



TRAFFIC COUNTS/ OD DURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – III ROUND -1				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
36	MANGLA POLICE CHECK POST	99	MIRPUR ROAD	28/12/2018
37	KHALIQABAD CHECK POST	100	MIRPUR ROAD	28/12/2018
38	BHARING TOLL PLAZA	101	KOTLA ROAD	28/12/2018
39	TERAKI TOLL PLAZA	102	N 5	27/12/2018
40	JHELM TOLL PLAZA	103	N 5	27/12/2018
41	KALA SHAH KAKU TOLL PLAZA	104	N 5	03/01/2019
42	POLICE STATION MITHA TIVANA	105	SARGODA MIANWALI ROAD	08/01/2019
43	FATEH SHAH	106	JHURABAD MUZAFFARGARH ROAD	10/01/2019
44	OOCTL PUMP	107	SARGODA FAISALABAD ROAD	11/01/2019
45	SHAKARWAL CHECK POST	108	JHANG BHAKAR ROAD	09/01/2019
46	HEAD BALUKI TOLL PLAZA	109	BHAI PHERU MORE KHUND ROAD	14/01/2019
47	PATTUKI TOLL PLAZA	110	N5	15/01/2019
48	NAKI ROAD	111	DEPALPUR ROAD	14/01/2019
49	BYCO PUMP	112	BHERA MALAKWAL ROAD	05/01/2019
50	KHUSHAB TOLL PLAZA	113	SARGODHA ROAD	08/01/2019
51	HAMEED RESTURENT	114	SARGODHA JHANG ROAD	10/01/2019
52	TALIBWALA ROAD	115	SARGODHA ROAD	12/01/2019
53	ABDUL MALIK TOLL PLAZA	116	LAHORE SARGODHA ROAD	03/01/2019
54	PSO PUMP FAISALABAD ROAD	117	FAISALABAD ROAD	16/01/2019
55	PINDI BHATIAN ROAD	118	M 3	13/02/2019
56	FAISALABAD TOLL PLAZA	119	M 3	13/02/2019
57	GOJRA INTERCHANGE	120	M 3	13/02/2019
58	ASKAR PUMP	121	BATAPUR - WAGAH	03/01/2019
59	HASHMI HOTEL	122	SARGODA ROAD	05/01/2019
60	GUJRANWALA TOLL PLAZA	123	N 5	02/02/2019
61	PSO PUMP SAMBRIAL ROAD	124	SIALKOT ROAD	29/12/2018
62	ATTOCK PETROL PUMP	125	DASKA ROAD	29/12/2018
63	PASRUR ROAD	126	PASRUR ROAD	31/12/2018
64	GUJRANWALA ROAD	127	GUJRANWALA ROAD	31/12/2018
65	PSO PUMP	128	PASRUR ROAD	31/12/2018
66	TOTAL PUMP PASRUR ROAD	129	PASRUR ROAD	01/01/2019
67	NEAR SHAKARGARH	130	SHAKARGARH ROAD	02/01/2019
68	HASCOL PUMP NOOR KOT	131	NAROWAL SHAKARGARH ROAD	01/01/2019
69	TOTAL PUMP NARANG MANDI	132	NAROWAL MUREEDKAY ROAD	02/01/2019
70	SHAHDRA TO KALA KHATAI ROAD	133	KALA KHATIE NARANG MANDI ROAD	02/01/2019
71	MIANWALI TOLL PLAZA	134	SARGODHA MIANWALI ROAD	08/01/2019
72	MADWA PETROLEUM	135	BHAKKAR JHANG ROAD	09/01/2019
73	PSO PUMP MEAR HAFIZABAD	136	GUJRANWALA ROAD	05/01/2019
74	25PULL CHECK POST	137	JHANG ROAD	17/01/2019



TRAFFIC COUNTS/ OD DURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – III ROUND -1				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
75	TOLL PLAZA CHINOT JHUNG ROAD	138	CHINNIOT ROAD	10/01/2019
76	MAZHABI TOLL PLAZA	139	OKARA FAISALABAD ROAD	16/01/2019
77	OKARA TOLL PLAZA	140	N 5	15/01/2019

4.5.2 Round – II

O-D Survey and Traffic Count for Round-2 was done in April 2019 to July 2019

Table 11: Traffic Counts/ OD Survey Data Collection Schedule for Package-III Round-2

TRAFFIC COUNTS/ OD DURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – III ROUND -2				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
1	CHAPER BISMILLAH HOTEL	64	KALLAR SYEDAN ROAD	21/4/2019
2	PHULGRAN TOLL PLAZA	65	N 75	23/4/2019
3	QUTBAL TOLL PLAZA	66	N80	19/4/2019
4	KAHUTA CLUB	67	KAHUTA ROAD	22/4/2019
5	ISLAMABAD PESHAWER TOLL PLAZA	68	M1	20/4/2019
6	MANDRA TOLL PLAZA	69	N5	24/4/2019
7	CHAKRI TOLL PLAZA	70	M2	05/04/2019
8	DHULIAN	71	TALAGANG ROAD	20/7/2019
9	BALKASAR TOLL PLAZA	72	M2	03/05/2019
10	MANDRA CHAKWAL ROAD	73	MANDRA CHAKWAL ROAD	02/05/2019
11	KALLAR KAHAR TOLL PLAZA	74	M2	01/05/2019
12	LILLAH TOLL PLAZA	75	M2	30/04/2019
13	ID 76 NEAR PETROL PUMP	76	GOJRA TOBA ROAD	02/07/2019
14	BHERA TOLL PLAZA	77	M2	29/04/2019
15	SALIM TOLL PLAZA	78	M2	28/04/2019
16	MAKHDOM INTERCHANGE	79	M2	17/07/2019
17	KOT SARWAR TOLL PLAZA	80	M2	15/07/2019
18	HASCOL PETROL PUMP	81	JHANG-FAISALABAD ROAD	18/07/2019
19	KHANQADOGAN TOLL PLAZA	82	M2	12/07/2019
20	SHEIKHUPURA TOLL PLAZA	83	M2	11/07/2019
21	KALA SHAH KAKU TOLL PLAZA	84	M2	24/04/2019
22	D I KHAN ROAD	85	D I KHAN ROAD	05/07/2019
23	TOBA - SHORKOT ROAD	86	TOBATEK SING-SHORKOT ROAD	01/07/2019
24	FAIZPUR TOLL PLAZA	87	M2	08/07/2019
25	NEAR ZERO POINT LAHORE	88	M2	09/07/2019
26	RAVI TOLL PLAZA	89	M2	27/06/2019
27	BANHAFAZ G	90	MIANWALI TALAGANG RD	07/07/2019
28	JHATLA	91	TALAGANG ROAD	08/07/2019



TRAFFIC COUNTS/ OD DURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – III ROUND -2				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
29	PAIL	92	KALLAR KAHAR ROAD	09/07/2019
30	SARGODHA BHALWAL ROAD	93	SARGODHA BHALWAL ROAD	12/07/2019
31	CHANAB TOLL PLAZA	94	N5	19/06/2019
32	LAHORE ROAD	95	LAHORE ROAD	16/07/2019
33	SHAHKOT TOLL PLAZA	96	FAISALABAD SHEIOKHUPURA ROAD	19/07/2019
34	BISMILLAH PETROL PUMP	97	FAISALABAD ROAD	06/07/2019
35	QANDHARI PETROLIUM	98	OKARA FAISALABAD ROAD	04/07/2019
36	MIRPUR ROAD	99	MIRPUR ROAD	18/06/2019
37	POLICE CHECK POST	100	MIRPUR ROAD	17/06/2019
38	BHIMBER GUJRAT ROAD	101	KOTLA ROAD	19/06/2019
39	TERRAKI TOLL PLAZA	102	N5	17/06/2019
40	N5	103	N5	18/06/2019
41	KALA SHAH KAKU TOLL PLAZA	104	N5	25/06/2019
42	TOTAL PUMP JOHARABAD	105	SARGODHA MIANWALI ROAD	11/07/2019
43	FATEH SHAH	106	JAUHARABAD MUZAFFAR GARH RD	02/07/2019
44	46 ADDA TOLL PLAZA	107	SARGODHA FAISALABAD ROAD	26/6/2019
45	DHALL MOR	108	JHANG BHAKKAR ROAD	03/07/2019
46	BHAI PHERU MORE KHUNDA ROAD	109	BHAI PHERU MORE KHUNDA ROAD	07/07/2019
47	PATTUKI TOLL PLAZA	110	N5	28/06/2019
48	NAVEED ZARAI FARM	111	DEPAL PUR ROAD	29/06/2019
49	MAQBOOL HOTEL	112	BHERA MALAKWAL ROAD	27/04/2019
50	JHELMUM BRIDGE	113	SARGODHA ROAD	10/07/2019
51	RAZA PETROL PUMP	114	SARGODHA JHANG ROAD	20/07/2019
52	PSO PUMP MANGNEE	115	N60	13/07/2019
53	AJNALA PUMP	116	LAHORE SARGODHA ROAD	10/07/2019
54	JARANWALA - OKARA ROAD	117	FAISALABAD ROAD	03/07/2019
55	PINDI BHATTIAN	118	M3	18/07/2019
INTERCHANGE				
56	FAISALABAD TOLL PLAZA	119	M4	15/07/2019
57	GOJRA TOLL PLAZA	120	M4	17/07/2019
58	GT ROAD WAGHA	121	BATAPUR ~ WAGAH ROAD	26/06/2019
59	HASHMI HOTEL	122	SARGODHA ROAD	26/04/2019
60	GUJRANWALA TOLL PLAZA	123	N5	23/06/2019
61	SHELL PETROL PUMP	124	SIALKOT ROAD	20/06/2019
62	DASKA ROAD	125	DASKA ROAD	20/06/2020
63	PASRUR ROAD	126	PASRUR ROAD	21/06/2019
64	SIALKOT ROAD	127	GUJRANWALA ROAD	22/06/2019
65	PSO PUMP KOTLI BAWA	128	PASRUR ROAD	21/06/2019
66	NAROWAL PASRUR ROAD	129	PASRUR ROAD NEAR NAROWAL	22/06/2019
67	BISMILLAH HOTEL	130	SHAKAR GARH ROAD	23/06/2019

TRAFFIC COUNTS/ OD SURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – III ROUND -2				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
68	NAROWAL SHAKARGARH ROAD	131	NAROWAL SHAKARGARH ROAD	24/06/2019
69	CNG STATION	132	NAROWAL-MURIDKE ROAD	25/06/2019
70	POLICE CHECK POST	133	KALA KHATAI NARANG MANDI RD	26/06/2019
71	NEAR JANRIA	134	SARGODHA MIANWALI ROAD	06/07/2019
72	JHAN KHAN	135	JHANG-BHAKKAR RD	04/07/2019
73	NEW QUETTA HOTEL	136	GUJRANWALA ROAD	13/07/2019
74	NEAR SHORKOT	137	JHANG ROAD	01/07/2019
75	CHINNIOT ROAD	138	CHINNIOT ROAD	19/07/2019
76	OKARA FAISALABAD ROAD	139	OKARA FAISALABAD ROAD	03/07/2019
77	OKARA TOLL PLAZA	140	N5	20/06/2019

4.6 Package – IV (PUNJAB - 2)

4.6.1 Round – I

Classified traffic count and origin destination survey was done on all 28 locations as specified by Client NTRC. Round-1 was done in the month of December 2018 to January 2019. Video recording unit (VRU) was used for classified counts as discussed and OD was performed by our OD team.

OD Survey and Traffic Count Survey for Round-1 was done in December 2018 to January 2019.

Table 12: Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-1

Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-1				
Sr. No	Locations	Location ID	Road	Date
1	N-5 Near Sadiqabad	168	N-5	17th/18th Dec 2018
2	N-5 Near Rahim Yar Khan	167	N-5	17th/18th Dec 2018
3	N-5(Uch Sharif - T.M.Panah)	166	N-5	19th/20th Dec 2018
4	N-5 Ahmedpur Toll Plaza	163	N-5	19th/20th Dec 2018



Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-1				
Sr. No	Locations	Location ID	Road	Date
5	Near Police Station TMP	164	Alipur-Uch Sharif Road	21st/22nd Dec 2018
6	Near Police Station Liaquatpur	165	Liaquatpur-Bahawalpur Road	21st/22nd Dec 2018
7	N-5 Lodhran Toll Plaza	161	N-5	24th/25th Dec 2018
8	N-5 Sutlej Toll Plaza	162	N-5	24th/25th Dec 2018
9	Near Police Station Larr	153	N-5	26th/27th Dec 2018
10	N-70 Sher Shah Toll Plaza	154	N-70	26th/27th Dec 2018
11	N-70 Ghazi Ghat Toll Plaza	155	N-70	28th/29th Dec 2018
12	N-70 Sakhi Sarwar Toll Plaza	160	N-70	28th/29th Dec 2018
13	N-55 Taunsa Toll Plaza	145	N-55	31st Dec 2019/1st Jan 2019
14	Near Police Station D.G.Khan	152	Taunsa Barrage Road	31st Dec 2019/1st Jan 2019
15	Near District Police Office Layyah	141	Kot Addu Layyah Road	2nd/3rd Jan 2019
16	Near Police Station Chaubara	142	Garh Maharaja Road	2nd/3rd Jan 2019
17	Near Police Station Ahmedpur Sial Jhang	147	Muzaffargarh Mor Road	4th/5th Jan 2019



Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-1				
Sr. No	Locations	Location ID	Road	Date
18	Near Police Station Shorkot	144	Jhang Road	4th/5th Jan2019
19	Near Police Station Chichawatni	146	Toba Chichawatni Road	7th/8th Jan2019
20	N-5 Harappa Toll Plaza	148	N-5	7th/8th Jan2019
21	N-5 Okara Toll Plaza	143	N-5	9th/10th Jan2019
22	Near Police Station Shakhkot	150	Mian Channu Burewala Road	9th/10th Jan2019
23	N-5 Mian Channu Toll Plaza	149	N-5	11th/12th Jan2019
24	N-5 Khanewal Toll Plaza	151	N-5	11th/12th Jan2019
25	Near Police Station Machewal	156	Vehari Burewala Road	14th/15th Jan2019
26	Near Police Station Baksh Khan	158	Vehari Road	14th/15th Jan2019
27	Bahawalnagar Toll Plaza	157	Arifwala Sahiwal Road	16th/17th Jan2019
28	Near Police Station Dunga Bunga	159	Haroonabad Bahawalnagar Road	16th/17th Jan2019

4.6.2 Round – II

Classified traffic count and origin destination survey was done on all 28 locations as specified by Client NTRC. Round-2 was done in the month of November 2019 to December 2019. Video

recording unit (VRU) was used for classified counts as discussed and OD was performed by our OD team.

OD Survey and Traffic Count Survey for Round-2 was done in November 2019 to December 2019.

Table 13: Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-2

Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-2				
Sr. No	Locations	Location ID	Road	Date
1	N-5 Near Sadiqabad	168	N-5	11th/12th Nov 2019
2	N-5 Near Rahim Yar Khan	167	N-5	11th/12th Nov 2019
3	N-5(Uch Sharif - T.M.Panah)	166	N-5	13th/14th Nov 2019
4	N-5 Ahmedpur Toll Plaza	163	N-5	13th/14th Nov 2019
5	Near Police Station TMP	164	Alipur-Uch Sharif Road	15th/16th Nov 2019
6	Near Police Station Liaquatpur	165	Liaquatpur- Bahawalpur Road	15th/16th Nov 2019
7	N-5 Lodhran Toll Plaza	161	N-5	18th/19th Nov 2019
8	N-5 Sutlej Toll Plaza	162	N-5	18th/19th Nov 2019
9	Near Police Station Larr	153	N-5	20th/21st Nov 2019
10	N-70 Sher Shah Toll Plaza	154	N-70	20th/21st Nov 2019



Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-2				
Sr. No	Locations	Location ID	Road	Date
11	N-70 Ghazi Ghat Toll Plaza	155	N-70	22nd/23rd Nov 2019
12	N-70 Sakhi Sarwar Toll Plaza	160	N-70	22nd/23rd Nov 2019
13	N-55 Taunsa Toll Plaza	145	N-55	25th/26th Nov 2019
14	Near Police Station D.G.Khan	152	Taunsa Barrage Road	25th/26th Nov 2019
15	Near District Police Office Layyah	141	Kot Addu Layyah Road	27th/28th Nov 2019
16	Near Police Station Chaubara	142	Garh Maharaja Road	27th/28th Nov 2019
17	Near Police Station Ahmedpur Sial Jhang	147	Muzaffargarh Mor Road	29th/30th Nov 2019
18	Near Police Station Shorkot	144	Jhang Road	29th/30th Nov 2019
19	Near Police Station Chichawatni	146	Toba Chichawatni Road	2nd/3rd Dec 2019
20	N-5 Harappa Toll Plaza	148	N-5	2nd/3rd Dec 2019
21	N-5 Okara Toll Plaza	143	N-5	4th/5th Dec 2019
22	Near Police Station Shahkot	150	Mian Channu Burewala Road	4th/5th Dec 2019
23	N-5 Mian Channu Toll Plaza	149	N-5	6th/7th Dec 2019
24	N-5 Khanewal Toll Plaza	151	N-5	6th/7th Dec 2019



Traffic Counts/ OD Survey Data Collection Schedule for Package-IV Round-2				
Sr. No	Locations	Location ID	Road	Date
25	Near Police Station Machewal	156	Vehari Burewala Road	9th/10th Dec2019
26	Near Police Station Baksh Khan	158	Vehari Road	9th/10th Dec2019
27	Bahawalnagar Toll Plaza	157	Arifwala Sahiwal Road	11th/12th Dec2019
28	Near Police Station Dunga Bunga	159	Haroonabad Bahawalnagar Road	11th/12th Dec2019

4.7 Package – V (SINDH)

4.7.1 Round – I

OD Survey and Traffic Count for Round-1 was done in January 2019 to February 2019.

Table 14: Traffic Counts/ OD Survey Data Collection Schedule for Package-V Round-1

TRAFFIC COUNTS/ O-D SURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – V ROUND - 1				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
1	GUDDU BARRIAGE	169	KASHMORE-GUDDU ROAD	21/01/2019
2	PUNJAB POLICE CHECK POST KASHMORE	170	N-55	21/01/2019
3	UBAURO TOLL PLAAZA	171	N-5	21/01/2019
4	SHAMBAY SHAH CHECK POST	172	N-65	05/02/2019
5	LAKHI MOR	173	N-65	22/01/2019
6	FAST PETOL PUMP AT SALEH PATH ROAD	174	SALEH PAT ROAD	22/01/2019
7	ROHRI TOLL PLAZA	175	N-5	23/01/2019
8	SEHWANI SARKAR ROAD	176	SEHWANI SARAK ROAD	04/02/2019
9	MEHAR TOLL PLAZA	177	N-55	04/02/2019
10	RANIPUR TOLL PLAZA	178	N-5	23/01/2019
11	JHALLO POST	179	DADU MORO	04/02/2019
12	SAEEDABAD TOLL PLAZA	180	N-5	24/01/2019
13	POLICE CHECK POST SHAHDADPUR-NAWABSHAH	181	NAWABSHAH-SHAHDADPUR	24/01/2019



TRAFFIC COUNTS/ O-D SURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – V ROUND - 1				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
	RD			
14	RAWATANI ROAD	182	NAWABSHAH ROAD	24/01/2019
15	SANGARH SORAH RD	183	SANGARH SORAH RD	23/01/2019
16	PURANA MIRPUR	184	MIRPUR-KHIPARO	25/01/2019
17	N120	185	N-120	25/01/2019
18	NEW BARAN CHECK POST	186	N-5	26/01/2019
19	KOTRI TO HYDERABAD	187	N-5	26/01/2019
20	JUDO ROAD	188	JUDO ROAD	28/01/2019
21	HASCOL PUMP	189	MIRPUR BATHORO ROAD	28/01/2019
22	SAJAWAL TO THATTA ROAD	190	SAJAWAL TO THATTA ROAD	28/01/2019
23	SASSUI TOLL PLAZA	191	SASSUI TOLL PLAZA	29/01/2019
24	M-9 TOLL PLAZA	192	M-9	02/02/2019
25	HUB CHOKI	193	N-25	31/01/2019

4.7.2 Round – II

OD Survey and Traffic Count for Round-2 was done in March 2019 to April 2019.

Table 15: Traffic Counts/ OD Survey Data Collection Schedule for Package-V Round-2

TRAFFIC COUNTS/ OD SURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – V ROUND - 2				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
1	GUDDU BARRIAGE	169	KASHMORE-GUDDU ROAD	25/03/2019
2	PUNJAB POLICE CHECK POST KASHMORE	170	N-55	25/03/2019
3	UBAURO TOLL PLAZA	171	N-5	26/03/2019
4	SHAMBAY SHAH CHECK POST	172	N-65	01/04/2019
5	LAKHI MOR	173	N-65	27/03/2019
6	FAST PETOL PUMP AT SALEH PATH ROAD	174	SALEH PAT ROAD	27/03/2019
7	ROHRI TOLL PLAZA	175	N-5	26/03/2019
8	SEHWANI SARKAR ROAD	176	SEHWANI SARKAR ROAD	01/04/2019
9	MEHAR TOLL PLAZA	177	N-55	02/04/2019
10	RANIPUR TOLL PLAZA	178	N-5	30/03/2019
11	JHALLO POST	179	DADU MORO	02/04/2019
12	SAEEDABAD TOLL PLAZA	180	N-5	04/04/2019
13	POLICE CHECK POST SHAHDADPUR-NAWABSHAH RD	181	NAWABSHAH-SHAHDADPUR	03/04/2019
14	RAWATANI ROAD	182	NAWABSHAH ROAD	04/04/2019
15	SANGARH SORAH RD	183	SANGARH SORAH RD	03/04/2019



TRAFFIC COUNTS/ OD SURVEY DATA COLLECTION SCHEDULE FOR PACKAGE – V ROUND -2				
SR NO	LOCATIONS	LOCATION ID	ROAD	DATE
16	PURANA MIRPUR	184	MIRPUR-KHIPARO	02/04/2019
17	N120	185	N-120	12/04/2019
18	NEW BARAN CHECK POST	186	N-5	12/04/2019
19	KOTRI TO HYDERABAD	187	N-5	06/04/2019
20	JUDO ROAD	188	JUDO ROAD	12/04/2019
21	HASCOL PUMP	189	MIRPUR BATHORO ROAD	26/03/2019
22	SAJAWAL TO THATTA ROAD	190	SAJAWAL TO THATTA ROAD	10/04/2019
23	SASSUI TOLL PLAZA	191	SASSUI TOLL PLAZA	11/04/2019
24	M-9 TOLL PLAZA	192	M-9	08/04/2019
25	HUB CHOKI	193	N-25	12/04/2019

4.8 Package – VI (BALUCHISTAN)

4.8.1 Round – I

Classified traffic count and origin destination survey was performed on all 25 locations as specified by Client NTRC. Round-1 was done in the month of July 2019 to August 2019. Video recording unit (VRU) was used for classified counts as discussed and OD was performed by our OD team.

Table 16: Traffic Counts/ OD Survey Data Collection Schedule for Package-VI Round-1

Traffic Counts/ OD Survey Data Collection Schedule for Package-VI Round-1				
Sr. No	Locations	Location ID	Road	Date & Day
1	Near Zhob	194	Zhob - Wanna Road	Thursday, August 1, 2019
2	N-50 Near Qila Saifullah	195	N-50	Thursday, August 1, 2019
3	Near Loralai Cantt	196	Sinjjawi Road (Sinjawai - Loralai)	Thursday, August 1, 2019
4	Near Barkhan	197	Rakni Road (Near Barkhan)	Tuesday, August 6, 2019
5	Near Muslim Bagh	198	N-50 (Muslim Bagh -	Tuesday, July 30, 2019



Traffic Counts/ OD Survey Data Collection Schedule for Package-VI Round-1				
Sr. No	Locations	Location ID	Road	Date & Day
			Quetta)	
6	Pak-Afghan Border (Chaman)	199	N-25	Tuesday, July 30, 2019
7	Near Ziarat	200	Loralai Road	Tuesday, July 30, 2019
8	Near Mastung	201	N-25 (Quetta - Mastung)	Tuesday, July 30, 2019
9	N-65 Near Sibi	202	N-65 (Bolan Pass)	Tuesday, August 6, 2019
10	Sui Road Near Dera Bugti	203	Sui Road (Near Dera Bugti)	Tuesday, August 6, 2019
11	Near Mastung (N-25)	204	N-25	Thursday, August 8, 2019
12	N-25 Near Qalat	205	N-26	Thursday, August 8, 2019
13	N-25 Near Nushki	206	N-40 (Quetta - Chagai)	Friday, August 2, 2019
14	Near Kharan	207	Kharan Road	Friday, August 2, 2019
15	Near Dalbandin	208	N-40	Friday, August 2, 2019
16	Near Koh-e-Taftan	209	N-41	Friday, August 2, 2019
17	Near Khuzdar	210	N-25	Friday, August 2, 2019
18	Near Bela	211	N-26	Friday, August 9, 2019



Traffic Counts/ OD Survey Data Collection Schedule for Package-VI Round-1				
Sr. No	Locations	Location ID	Road	Date & Day
19	Near Bela	212	Bela - Hoshab Road (Near Bela)	Friday, August 9, 2019
20	Near Awaran	213	Bela - Hoshab Road	Friday, August 9, 2019
21	Near Panjgur	214	N-85	Thursday, August 8, 2019
22	Near Kech Bridge Turbat	215	Mand Road	Friday, July 26, 2019
23	Near Ormara	216	N-10 (Malan - Ormara)	Friday, July 26, 2019
24	Near Pasni	217	N-10 Makran-Costal Highway	Friday, July 26, 2019
25	Near Gwadar	218	N-10 Makran-Costal Highway	Friday, July 26, 2019

4.8.2 Round – II

O-D Survey and Traffic count for Round-II of Package - VI was cancelled due to security reasons.

4.9 O-D Survey Hard Copies

Specified form were design to collect the O-D survey data on field. Some of the samples of data collected on O-D form on site are shown below.



Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: _____ Time Period: _____ Date: _____
Location: _____ Direction: _____

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	H/ALE	14	16	Peshawar	Home	Swabi	work	210
				"	Relatives	"	Home	"
				"	work	"	"	"
				"	Home	"	work	"
				"	work	"	Home	"
2	H/ALE	15	16	Peshawar	Home	Topi (Swabi)	work	220
				"	"	"	"	"
				"	Relatives	"	Home	"
				"	work	"	"	"
				"	Home	"	work	"
3	H/ALE	14	16	Peshawar	Home	Swabi	work	250
				"	"	"	"	"
				"	"	"	Relatives	"
				"	"	"	work	"
				"	"	"	"	"

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: Ali Akbar Time Period: 10:30 AM Date: 31/12/2019
Location: RS Direction: NB Day: Wednesday

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	Mini Bus	14	36	Topi	work	Ghazi	Home	20
				"	"	"	"	"
				"	Home	"	work	"
				"	"	"	"	"
				"	"	"	Home	170
2	Mini Bus	15	15	Topi	work	GS	Home	"
				"	"	"	"	"
				"	Home	"	work	"
				"	"	"	"	"
				"	"	"	"	"
3	Mini Bus	13	35	Topi	work	Ghazi	Home	30
				"	"	"	"	"
				"	"	"	"	"
				"	"	"	"	"
				"	"	"	"	"

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: COMRAHER Time Period: 9 AM Date: 23/12/19
Location: RD-32 Direction: South Bound (East) Day: Wednesday

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	H/ALE	14	16	Peshawar	Home	Swabi	Relatives	230
				"	work	"	Home	"
				"	"	"	"	"
				"	"	"	"	"
				"	"	"	"	"
2	H/ALE	16	16	Peshawar	work	Swabi	Home	230
				"	"	"	"	"
				"	Home	"	Education	"
				"	"	"	"	"
				"	"	"	"	"
3	H/ALE	15	16	Peshawar	work	Topi (Swabi)	Home	220
				"	Relatives	"	"	"
				"	Home	"	work	"
				"	work	"	Home	"
				"	"	"	"	"

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: COMRAHER Time Period: 9:20 AM Date: 23/12/19
Location: RD-32 Direction: South Bound (East) Day: Wednesday

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	H/ALE	16	16	Peshawar	work	Swabi	Home	230
				"	Education	"	"	"
				"	Home	"	Relatives	"
				"	"	"	"	"
				"	"	"	"	"
2	H/ALE	15	16	Peshawar	Home	Topi (Swabi)	work	220
				"	Business	"	Home	"
				"	work	"	"	"
				"	"	"	"	"
				"	"	"	"	"
3	H/ALE	15	16	Peshawar	Home	Swabi	work	230
				"	work	"	Home	"
				"	"	"	"	"
				"	"	"	"	"
				"	Other	"	Home	"

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: Ali Akbar Time Period: 10 AM - 10 PM Date: 8-4-2019
Location: RS Direction: S-B Day: Monday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Community Carried	Unit	Quantity
1	Car	Home	work	Home	work	Home	1	5				
2	Car	Home	work	Home	work	Home	2	5				
3	Car	Home	work	Home	work	Home	2	5				
4	Car	Home	work	Home	work	Home	1	5				
5	Car	Home	work	Home	work	Home	1	5				
6	Car	Home	work	Home	work	Home	1	5				
7	Car	Home	work	Home	work	Home	1	5				
8	Car	Home	work	Home	work	Home	1	5				
9	Car	Home	work	Home	work	Home	1	5				
10	Car	Home	work	Home	work	Home	1	5				

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: Ali Akbar Time Period: 8 AM - 8 PM Date: 8-4-2019
Location: RS Direction: N-B Day: Monday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Community Carried	Unit	Quantity
1	Car	Home	work	Home	work	Home	1	5				
2	Car	Home	work	Home	work	Home	1	5				
3	Car	Home	work	Home	work	Home	1	5				
4	Car	Home	work	Home	work	Home	1	5				
5	Car	Home	work	Home	work	Home	1	5				
6	Car	Home	work	Home	work	Home	1	5				
7	Car	Home	work	Home	work	Home	1	5				
8	Car	Home	work	Home	work	Home	1	5				
9	Car	Home	work	Home	work	Home	1	5				
10	Car	Home	work	Home	work	Home	1	5				

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: Ali Akbar Time Period: 10 AM - 10 PM Date: 23/12/2019
Location: RS Direction: S-B Day: Wednesday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Community Carried	Unit	Quantity
1	Car	Home	work	Home	work	Home	1	5				
2	Car	Home	work	Home	work	Home	1	5				
3	Car	Home	work	Home	work	Home	1	5				
4	Car	Home	work	Home	work	Home	1	5				
5	Car	Home	work	Home	work	Home	1	5				
6	Car	Home	work	Home	work	Home	1	5				
7	Car	Home	work	Home	work	Home	1	5				
8	Car	Home	work	Home	work	Home	1	5				
9	Car	Home	work	Home	work	Home	1	5				
10	Car	Home	work	Home	work	Home	1	5				

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: Ali Akbar Time Period: 10 AM - 10 PM Date: 23-12-2019
Location: RS Direction: S-B Day: Wednesday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Community Carried	Unit	Quantity
1	Car	Home	work	Home	work	Home	1	5				
2	Car	Home	work	Home	work	Home	1	5				
3	Car	Home	work	Home	work	Home	1	5				
4	Car	Home	work	Home	work	Home	1	5				
5	Car	Home	work	Home	work	Home	1	5				
6	Car	Home	work	Home	work	Home	1	5				
7	Car	Home	work	Home	work	Home	1	5				
8	Car	Home	work	Home	work	Home	1	5				
9	Car	Home	work	Home	work	Home	1	5				
10	Car	Home	work	Home	work	Home	1	5				



Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: SB

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Work	Home	Work	Home	Work	1	2				
2	Car	Work	Home	Work	Home	Work	2	2				
3	Car	Work	Home	Work	Home	Work	3	3				
4	Car	Work	Home	Work	Home	Work	4	4				
5	Car	Work	Home	Work	Home	Work	5	5				
6	Car	Work	Home	Work	Home	Work	6	6				
7	Car	Work	Home	Work	Home	Work	7	7				
8	Car	Work	Home	Work	Home	Work	8	8				
9	Car	Work	Home	Work	Home	Work	9	9				
10	Car	Work	Home	Work	Home	Work	10	10				

Vehicle Type: 1. Car/Mini/Two/Three/Quad, 2. Pickup Truck/Open Back Single/Double Cabin, 3. Auto Truck, 4. 3-Axis Truck, 5. 4-Axis and Above Truck, 6. Tractor/Trolley

Loading Condition: 1. Empty, 2. 1/4, 3. 1/2, 4. 3/4, 5. Full, 6. 2/3 Container, 7. 1/2 Container, 8. 3/4 Container, 9. Full Container

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: NR (East)

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Work	Home	Work	Home	Work	1	2				
2	Car	Work	Home	Work	Home	Work	2	2				
3	Car	Work	Home	Work	Home	Work	3	3				
4	Car	Work	Home	Work	Home	Work	4	4				
5	Car	Work	Home	Work	Home	Work	5	5				
6	Car	Work	Home	Work	Home	Work	6	6				
7	Car	Work	Home	Work	Home	Work	7	7				
8	Car	Work	Home	Work	Home	Work	8	8				
9	Car	Work	Home	Work	Home	Work	9	9				
10	Car	Work	Home	Work	Home	Work	10	10				

Vehicle Type: 1. Car/Mini/Two/Three/Quad, 2. Pickup Truck/Open Back Single/Double Cabin, 3. Auto Truck, 4. 3-Axis Truck, 5. 4-Axis and Above Truck, 6. Tractor/Trolley

Loading Condition: 1. Empty, 2. 1/4, 3. 1/2, 4. 3/4, 5. Full, 6. 2/3 Container, 7. 1/2 Container, 8. 3/4 Container, 9. Full Container

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: SB

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Work	Home	Work	Home	Work	1	2				
2	Car	Work	Home	Work	Home	Work	2	2				
3	Car	Work	Home	Work	Home	Work	3	3				
4	Car	Work	Home	Work	Home	Work	4	4				
5	Car	Work	Home	Work	Home	Work	5	5				
6	Car	Work	Home	Work	Home	Work	6	6				
7	Car	Work	Home	Work	Home	Work	7	7				
8	Car	Work	Home	Work	Home	Work	8	8				
9	Car	Work	Home	Work	Home	Work	9	9				
10	Car	Work	Home	Work	Home	Work	10	10				

Vehicle Type: 1. Car/Mini/Two/Three/Quad, 2. Pickup Truck/Open Back Single/Double Cabin, 3. Auto Truck, 4. 3-Axis Truck, 5. 4-Axis and Above Truck, 6. Tractor/Trolley

Loading Condition: 1. Empty, 2. 1/4, 3. 1/2, 4. 3/4, 5. Full, 6. 2/3 Container, 7. 1/2 Container, 8. 3/4 Container, 9. Full Container

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: NR

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin Name	Origin Purpose	Destination Name	Destination Purpose	Fare
1	Mini Bus	14	36	Tapi	Work	Shree	Home	20
2	Mini Bus	15	15	Tapi	Work	Shree	Home	120
3	Mini Bus	13	35	Tapi	Work	Shree	Home	30

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: SB

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Work	Home	Work	Home	Work	1	2				
2	Car	Work	Home	Work	Home	Work	2	2				
3	Car	Work	Home	Work	Home	Work	3	3				
4	Car	Work	Home	Work	Home	Work	4	4				
5	Car	Work	Home	Work	Home	Work	5	5				
6	Car	Work	Home	Work	Home	Work	6	6				
7	Car	Work	Home	Work	Home	Work	7	7				
8	Car	Work	Home	Work	Home	Work	8	8				
9	Car	Work	Home	Work	Home	Work	9	9				
10	Car	Work	Home	Work	Home	Work	10	10				

Vehicle Type: 1. Car/Mini/Two/Three/Quad, 2. Pickup Truck/Open Back Single/Double Cabin, 3. Auto Truck, 4. 3-Axis Truck, 5. 4-Axis and Above Truck, 6. Tractor/Trolley

Loading Condition: 1. Empty, 2. 1/4, 3. 1/2, 4. 3/4, 5. Full, 6. 2/3 Container, 7. 1/2 Container, 8. 3/4 Container, 9. Full Container

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: NR

No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin Name	Origin Purpose	Destination Name	Destination Purpose	Fare
1	BUS	44	65	Shree	Job	Home	Home	600
2	BUS	12	16	Shree	Job	Home	Home	600
3	BUS	14	16	Shree	Job	Home	Home	600

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: SB

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Work	Home	Work	Home	Work	1	2				
2	Car	Work	Home	Work	Home	Work	2	2				
3	Car	Work	Home	Work	Home	Work	3	3				
4	Car	Work	Home	Work	Home	Work	4	4				
5	Car	Work	Home	Work	Home	Work	5	5				
6	Car	Work	Home	Work	Home	Work	6	6				
7	Car	Work	Home	Work	Home	Work	7	7				
8	Car	Work	Home	Work	Home	Work	8	8				
9	Car	Work	Home	Work	Home	Work	9	9				
10	Car	Work	Home	Work	Home	Work	10	10				

Vehicle Type: 1. Car/Mini/Two/Three/Quad, 2. Pickup Truck/Open Back Single/Double Cabin, 3. Auto Truck, 4. 3-Axis Truck, 5. 4-Axis and Above Truck, 6. Tractor/Trolley

Loading Condition: 1. Empty, 2. 1/4, 3. 1/2, 4. 3/4, 5. Full, 6. 2/3 Container, 7. 1/2 Container, 8. 3/4 Container, 9. Full Container

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: S. S. S. S. Time Period: 10-03-2019 Date: 10-03-2019
Location: 10-03 Direction: NR

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin Name	Origin Purpose	Destination Name	Destination Purpose	Fare
1	BUS	61	65	Shree	Job	Home	Home	350
2	Mini	28	28	Shree	Job	Home	Home	350
3	BUS	47	48	Shree	Job	Home	Home	350



Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: SAHIB Time Period: 12:00-12:30 Date: 11-12-2019
Location: RD-103 Direction: NR Day: Wednesday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Home	Work	Home	Work	N/S	2	5				
2	Car	Home	Work	Home	Work	N/S	2	5				
3	Car	Home	Work	Home	Work	N/S	2	5				
4	Car	Home	Work	Home	Work	N/S	2	5				
5	Car	Home	Work	Home	Work	N/S	2	5				
6	Car	Home	Work	Home	Work	N/S	2	5				
7	Car	Home	Work	Home	Work	N/S	2	5				
8	Car	Home	Work	Home	Work	N/S	2	5				
9	Car	Home	Work	Home	Work	N/S	2	5				
10	Car	Home	Work	Home	Work	N/S	2	5				

Vehicle Type: 1. Car (Van)/Taxi/Pickup/Mini Bus, 2. Pickup Truck Open Back Single/Double Cabin, 3. Auto Rickshaw, 4. Auto and Above Truck, 5. Tractor/Trolley

Loading Conditions: 1. Empty, 2. 1/4, 3. 1/2, 4. 3/4, 5. Full, 20 Container, 40 Container, 60 Container

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: SAHIB Time Period: 12:00-12:30 Date: 12-12-19
Location: 163 Direction: NR Day: Wednesday

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	BUS	65	65	Home	Work	Home	Work	3100
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
2	BUS	53	65	Home	Work	Home	Work	500
				Home	Work	Home	Work	290
				Home	Work	Home	Work	580
				Home	Work	Home	Work	750
3	Hire	16	16	Home	Work	Home	Work	120,000
				Home	Work	Home	Work	11

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: SAHIB Time Period: 11:30 Date: 6-6-2019
Location: RD-07 Direction: NR Day: Thursday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Home	Work	Home	Work	N/S	2	2				
2	Car	Home	Work	Home	Work	N/S	2	2				
3	Car	Home	Work	Home	Work	N/S	2	2				
4	Car	Home	Work	Home	Work	N/S	2	2				
5	Car	Home	Work	Home	Work	N/S	2	2				
6	Car	Home	Work	Home	Work	N/S	2	2				
7	Car	Home	Work	Home	Work	N/S	2	2				
8	Car	Home	Work	Home	Work	N/S	2	2				
9	Car	Home	Work	Home	Work	N/S	2	2				
10	Car	Home	Work	Home	Work	N/S	2	2				

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: SAHIB Time Period: 12:00-12:30 Date: 27-12-19
Location: RD-08 Direction: NR Day: Wednesday

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	HIRE	18	18	Home	Work	Home	Work	180
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
2	HIRE	15	15	Home	Work	Home	Work	220
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
3	HIRE	15	15	Home	Work	Home	Work	220
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: SAHIB Time Period: 10:00-10:30 Date: 1-01-20
Location: RD-11 Direction: NR Day: Monday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Home	Work	Home	Work	N/S	2	5				
2	Car	Home	Work	Home	Work	N/S	2	5				
3	Car	Home	Work	Home	Work	N/S	2	5				
4	Car	Home	Work	Home	Work	N/S	2	5				
5	Car	Home	Work	Home	Work	N/S	2	5				
6	Car	Home	Work	Home	Work	N/S	2	5				
7	Car	Home	Work	Home	Work	N/S	2	5				
8	Car	Home	Work	Home	Work	N/S	2	5				
9	Car	Home	Work	Home	Work	N/S	2	5				
10	Car	Home	Work	Home	Work	N/S	2	5				

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)

Surveyor Name: SAHIB Time Period: 10:00-10:30 Date: 01-01-20
Location: RD-11 Direction: NR Day: Monday

Sr.No	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Vehicle Capacity	Loading Condition	Commodity Carried	Unit	Quantity
1	Car	Home	Work	Home	Work	N/S	2	5				
2	Car	Home	Work	Home	Work	N/S	2	5				
3	Car	Home	Work	Home	Work	N/S	2	5				
4	Car	Home	Work	Home	Work	N/S	2	5				
5	Car	Home	Work	Home	Work	N/S	2	5				
6	Car	Home	Work	Home	Work	N/S	2	5				
7	Car	Home	Work	Home	Work	N/S	2	5				
8	Car	Home	Work	Home	Work	N/S	2	5				
9	Car	Home	Work	Home	Work	N/S	2	5				
10	Car	Home	Work	Home	Work	N/S	2	5				

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: SAHIB Time Period: 10:00-10:30 Date: 1-01-20
Location: RD-12 Direction: NR Day: Monday

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	Hire	18	18	Home	Work	Home	Work	650
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
2	Hire	18	18	Home	Work	Home	Work	650
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
3	Hire	18	18	Home	Work	Home	Work	650
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11

Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Public Transport)

Surveyor Name: SAHIB Time Period: 10:00-10:30 Date: 1-01-20
Location: RD-12 Direction: NR Day: Monday

Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	Hire	18	18	Home	Work	Home	Work	650
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
2	Hire	18	18	Home	Work	Home	Work	650
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
3	Hire	18	18	Home	Work	Home	Work	650
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11
				Home	Work	Home	Work	11



4.10 Punching of OD Data

OD Data is collected in hard form on site for 24 hours on specified form describe above. For traffic Counts VRU was used side by side with O-D survey for traffic count data collection. This data is further being converted in to excel data sheets for analysis purposes. Some of the samples are shown below.

Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)														
NTRC		Survegor Name: ZUHAIB AHMAD				Time Period: 10 PM- 10 AM				Date: 02-01-2019		Zeeruk International Pvt. Ltd		
		Location: ID-28				Direction: NB				Day: WEDNESDAY				
Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding	
11	Hiace	Hiace	2	17	19	Topi	49	Shopping	5	Mansehra	40	Home	1	240
						Topi	49	Shopping	5	Mansehra	40	Home	1	240
						Topi	49	Home	1	Mansehra	40	Shopping	5	240
						Topi	49	Home	1	Mansehra	40	Shopping	5	240
						Topi	49	Work	2	Mansehra	40	Home	1	240
						Topi	49	Work	2	Mansehra	40	Home	1	240
12	Hiace	Hiace	2	19	19	Topi	49	Home	1	Rawalpindi	91	Work	2	170
						Topi	49	Home	1	Rawalpindi	91	Work	2	170
						Topi	49	Work	2	Rawalpindi	91	Home	1	170
						Topi	49	Work	2	Rawalpindi	91	Home	1	170
						Topi	49	Visit Relative	7	Rawalpindi	91	Home	1	170
						Topi	49	Visit Relative	7	Rawalpindi	91	Home	1	170

Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)														
NTRC		Survegor Name: SHOAI B HUSSAIN				Time Period: 10 PM- 10 AM				Date: 03-01-2019		Zeeruk International Pvt. Ltd		
		Location: ID-28				Direction: SB				Day: THURSDAY				
Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding	
1	Large Bus	Large Bus	4	25	30	Ghazi	49	Home	1	Topi	49	Work	2	20
						Ghazi	49	Home	1	Topi	49	Work	2	20
						Ghazi	49	Work	2	Topi	49	Home	1	20
						Ghazi	49	Work	2	Topi	49	Home	1	20
						Ghazi	49	Visit Relative	7	Topi	49	Home	1	20
						Ghazi	49	Visit Relative	7	Topi	49	Home	1	20
2	Hiace	Hiace	2	8	15	Rawalpindi	91	Home	1	Topi	49	Work	2	170
						Rawalpindi	91	Home	1	Topi	49	Work	2	170
						Rawalpindi	91	Visit Relative	7	Topi	49	Home	1	170
						Rawalpindi	91	Visit Relative	7	Topi	49	Home	1	170
						Rawalpindi	91	Business	3	Topi	49	Home	1	170
						Rawalpindi	91	Business	3	Topi	49	Home	1	170
3	Mini Bus	Hiace	3	29	29	Ghazi	49	Work	2	Topi	49	Home	1	20
						Ghazi	49	Work	2	Topi	49	Home	1	20
						Ghazi	49	Visit Relative	7	Topi	49	Home	1	20
						Ghazi	49	Home	1	Topi	49	Education	4	20



Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)														
NTRC		Surveyor Name: Faiq Ahmed				Time Period: 24 hours				Date: 26th July 2019				
Location: 218		Direction: , Climate: Drizzling				Day: Friday				Zeeruk International Pvt. Ltd				
Sr.No	Vehicle Type	Vehicle Type	Vehicle Code	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding	
1	Hiace	Hiace	2	5	18	Gwadar	140			Pasni	131			400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140			Pasni	131			
2	Van	Hiace	2	8	22	Gwadar	140	Home	1	Pasni	131	Work	2	400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140	Home	1	Pasni	131	Work	2	
3	Van	Hiace	2	12	22	Gwadar	140	Home	1	Pasni	131	Work	2	400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140			Pasni	131			

Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)														
NTRC		Surveyor Name: Faiq Ahmed				Time Period: 24 hours				Date: 26th July 2019				
Location: 218		Direction: , Climate: Drizzling				Day: Friday				Zeeruk International Pvt. Ltd				
Sr.No	Vehicle Type	Vehicle Type	Vehicle Code	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding	
1	Hiace	Hiace	2	5	18	Gwadar	140			Pasni	131			400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140			Pasni	131			
2	Van	Hiace	2	8	22	Gwadar	140	Home	1	Pasni	131	Work	2	400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140	Home	1	Pasni	131	Work	2	
3	Van	Hiace	2	12	22	Gwadar	140	Home	1	Pasni	131	Work	2	400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140			Pasni	131			

Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Cars and Heavy Vehicles)											
NTRC		Surveyor Name: RAEES-AKH				Time Period: 10PM TO 10PM				Date: 2-1-2019	
Location: ID-07		Direction: N.B				Day: WEDNESDAY		Zeeruk International Pvt. Ltd			
Sr.No	Vehicle Type	Vehicle Type	Origin	Purpose	Destination	Purpose	Route	Number of Occupants	Commodity Carried	Unit	Quantity
1	Car	Car	Mansehra	Home	Balakot	Work	N-15	2			
2	Car	Car	Mansehra	Work	Balakot	Home	N-15	3			
3	Car	Car	Mansehra	Home	Balakot	Work	N-15	2			
4	Car	Car	Mansehra	Home	Balakot	Work	N-15	2			
5	Car	Car	Mansehra	Home	Kaghan	Work	N-15	1			



Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)								
Surveyor Name: ZUHAIB AHMAI			Time Period: 10 PM- 10 AM			Date: 02-01-20		
Location: ID-07			Direction: NB			Day: WEDNESDAY		
Sr.No	Vehicle Type	Number of Occupants	Vehicle Capacity	Origin		Destination		Fare
				Name	Purpose	Name	Purpose	
1	Hiace	20	16	Mansehra	Home	Balakot	Work	100
				Mansehra	Home	Balakot	Work	100
				Mansehra	Work	Balakot	Home	100
				Mansehra	Work	Balakot	Home	100
				Mansehra	Relative	Balakot	Home	100
				Mansehra	Relative	Balakot	Home	100
2	Hiace	18	16	Mansehra	Home	Balakot	Work	100
				Mansehra	Home	Balakot	Work	100
				Mansehra	Relative	Balakot	Home	100
				Mansehra	Relative	Balakot	Home	100
				Mansehra	Business	Balakot	Home	100
				Mansehra	Business	Balakot	Home	100

4.11 Coding of OD Data

After punching the next step is coding of this whole data. Every item in the form give certain codes for analysis purposes. Codes were already defined by NTRC. Some of the samples are shown below.



Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)															
NTRC		Survegor Name: SHOAB HUSSAIN				Time Period: 10 PM- 10 AM				Date: 03-01-2019				Zeeruk International Pvt. Ltd	
		Location: ID-28				Direction: SB				Day: THURSDAY					
Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare	
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding		
1	Large Bus	Large Bus	4	25	30	Ghazi	49	Home	1	Topi	49	Work	2	20	
						Ghazi	49	Home	1	Topi	49	Work	2	20	
						Ghazi	49	Work	2	Topi	49	Home	1	20	
						Ghazi	49	Work	2	Topi	49	Home	1	20	
						Ghazi	49	Visit Relative	7	Topi	49	Home	1	20	
2	Hiace	Hiace	2	8	15	Rawalpindi	91	Home	1	Topi	49	Work	2	170	
						Rawalpindi	91	Home	1	Topi	49	Work	2	170	
						Rawalpindi	91	Visit Relative	7	Topi	49	Home	1	170	
						Rawalpindi	91	Visit Relative	7	Topi	49	Home	1	170	
						Rawalpindi	91	Business	3	Topi	49	Home	1	170	
						Rawalpindi	91	Business	3	Topi	49	Home	1	170	
						Ghazi	49	Work	2	Topi	49	Home	1	20	

Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)															
NTRC		Survegor Name: ZUHAIB AHMAD				Time Period: 10 PM- 10 AM				Date: 02-01-2019				Zeeruk International Pvt. Ltd	
		Location: ID-28				Direction: NB				Day: WEDNESDAY					
Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare	
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding		
1	Mini Bus	Hiace	3	27	35	Topi	49	Home	1	Ghazi	30	Work	2	20	
						Topi	49	Home	1	Ghazi	30	Work	2	20	
						Topi	49	Work	2	Ghazi	30	Home	1	20	
						Topi	49	Work	2	Ghazi	30	Home	1	20	
						Topi	49	Visit Relative	7	Ghazi	30	Home	1	20	
2	Mini Bus	Hiace	3	17	17	Topi	49	Home	1	Rawalpindi	91	Work	2	170	
						Topi	49	Home	1	Rawalpindi	91	Work	2	170	
						Topi	49	Visit Relative	7	Rawalpindi	91	Home	1	170	
						Topi	49	Visit Relative	7	Rawalpindi	91	Home	1	170	
						Topi	49	Business	3	Rawalpindi	91	Home	1	170	
						Topi	49	Business	3	Rawalpindi	91	Home	1	170	

Origin - Destination Survey and Transport Demand - NTRC (Road Side Interview form for Passenger Cars)															
NTRC		Survegor Name: ZUHAIB AHMAD				Time Period: 10 PM- 10 AM				Date: 02-01-2019				Zeeruk International Pvt. Ltd	
		Location: ID-28				Direction: NB				Day: WEDNESDAY					
Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare	
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding		
12	Hiace	Hiace	2	19	19	Topi	49	Home	1	Rawalpindi	91	Work	2	170	
						Topi	49	Home	1	Rawalpindi	91	Work	2	170	
						Topi	49	Work	2	Rawalpindi	91	Home	1	170	
						Topi	49	Work	2	Rawalpindi	91	Home	1	170	
						Topi	49	Visit Relative	7	Rawalpindi	91	Home	1	170	
13	Hiace	Hiace	2	22	38	Topi	49	Home	1	Ghazi	30	Work	2	20	
						Topi	49	Home	1	Ghazi	30	Work	2	20	
						Topi	49	Work	2	Ghazi	30	Home	1	20	
						Topi	49	Work	2	Ghazi	30	Home	1	20	
						Topi	49	Visit Relative	7	Ghazi	30	Home	1	20	
14	Hiace	Hiace	2	16	16	Topi	49	Home	1	Lahore	78	Work	2	Special	
						Topi	49	Home	1	Lahore	78	Work	2	Special	
						Topi	49	Work	2	Lahore	78	Home	1	Special	
						Topi	49	Work	2	Lahore	78	Home	1	Special	



**Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Cars and Heavy Vehicles)**

Surveyor Name: RAEES-AKHTAR

Time Period: 10PM TO 10PM

Date: 2-1-2019

Location: ID-28

Direction: N.B

Day: WEDNESDAY

Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Origin	Zone	Purpose	Origin Purpose Coding	Destination	Zone	Purpose	Destination Purpose Coding	Route	Number of Occupants	Vehicle capacity	Loading Condition
1	Car	Car	1	Gadoon	49	Home	1	Ghazi	30	Work	2	Ghazi Road	4	5	
2	2-Axle	2-Axle	6	Gadoon	49	Load	1	Ghazi	30	Unload	2	Ghazi Road	2	3	Full
3	Car	Car	1	Gadoon	49	Home	1	Ghazi	30	Work	2	Ghazi Road	3	5	
4	Car	Car	1	Gadoon	49	Home	1	Wah Cantt	91	Work	2	Ghazi Road	4	5	
5	2-Axle	2-Axle	6	Topi	49	Load	1	Hattar	30	Unload	2	Ghazi Road	2	3	Full
6	Car	Car	1	Topi	49	Home	1	Ghazi	30	Work	2	Ghazi Road	2	5	
7	2-Axle	2-Axle	6	Topi	49	Unload	2	Ghazi	30	Load	1	Ghazi Road	2	3	Empty
8	Car	Car	1	Topi	49	Home	1	Islamabad	91	Work	2	Ghazi Road	2	5	
9	Car	Car	1	Gadoon	49	Home	1	Islamabad	91	Work	2	Ghazi Road	3	5	
10	2-Axle	2-Axle	6	Gadoon	49	Unload	2	Hattar	30	Load	1	Ghazi Road	2	3	Empty
11	Car	Car	1	Gadoon	49	Home	1	Ghazi	30	Work	2	Ghazi Road	3	5	
12	Car	Car	1	Gadoon	49	Home	1	Ghazi	30	Work	2	Ghazi Road	2	5	
13	2-Axle	2-Axle	6	Topi	49	Load	1	Sargodha	93	Unload	2	Ghazi Road	2	3	Full



**Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Passenger Cars)**

Surveyor Name: Faig Ahmed

Time Peric Time Period: 24 hours

Date: 26th July 2019

Zeeruk International Pvt. Ltd

Location: 218

Direction: Climage: Drizzling

Day: Friday

Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding	
6	Coach	Large Bus	3	20	40	Gwadar	140			Pasni	131			400
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
7	Hiace	Hiace	2	10	18	Gwadar	140	Home	1	Pasni	131	Work	2	400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140			Pasni	131			
8	Van	Hiace	2	12	22	Gwadar	140			Pasni	131			400
						Gwadar	140			Pasni	131			
						Gwadar	140	Home	1	Pasni	131	Work	2	
						Gwadar	140			Pasni	131			



**Origin - Destination Survey and Transport Demand - NTRC
(Road Side Interview form for Passenger Cars)**

Surveyor Name: Faig Ahmed

Time Period: Time Period: 24 hours

Date: 26th July 2019

Zeeruk International Pvt. Ltd

Location: 218

Direction: Climage: Drizzling

Day: Friday

Sr.No	Vehicle Type	Vehicle Type	Vehicle Coding	Number of Occupants	Vehicle Capacity	Origin				Destination				Fare
						Name	Zone	Purpose	Purpose Coding	Name	Zone	Purpose	Purpose Coding	
1	Van	Hiace	2	19	22	Bela	143				156			650
						Bela	143	Home	1		156	Work	2	
						Bela	143			Washuk	156			
						Bela	143	Home	1	Washuk	156	Work	2	
						Bela	143	Home	1	Washuk	156	Work	2	
						Bela	143	Home	1	Washuk	156	Work	2	
2	Coach	Large Bus	3	35	44	Karachi	106			Panjgur	138			440
						Karachi	106	Home	1	Panjgur	138	Work	2	
						Karachi	106	Home	1	Panjgur	138	Work	2	
						Karachi	106	Home	1	Panjgur	138	Work	2	
						Karachi	106	Home	1	Panjgur	138	Work	2	
						Karachi	106	Home	1	Panjgur	138	Work	2	
3	Van	Hiace	2	17	22	Wadh	139			Washuk	156			600
						Wadh	139	Home	1	Washuk	156	Work	2	
						Wadh	139			Washuk	156			
						Wadh	139	Home	1	Washuk	156	Work	2	

4.12 OD Matrices

Based on the O-D survey results, the O-D matrix was made that shows the traffic movement from one TAZ to another TAZ. 6 type of matrices were made for each direction of travel at survey site.

Following type of matrices were made:

1. OD matrix for Car/ Jeep/ Pajero.
2. OD matrix for Pickups.
3. OD matrix for 2-Axle and 3-Axle Trucks.
4. OD matrix for 4-Axle and above Trucks
5. OD matrix for Hiace and Minibuses.
6. OD matrix for Buses.

A sample of such matrix is shown below.

Origin \ Destination	1	2	3	Z
1	T_{11}	T_{12}	T_{13}	T_{1Z}
2	T_{21}			
3	T_{31}			
Z	T_{Z1}			T_{ZZ}

Where T_{ij} = Trips from origin i to destination j . The size of matrix was 162 by 162 as there were 162 zones.

OD matrix for each direction was then multiplied by its respective counts to obtain the total vehicles traversing from one TAZ to another TAZ. The OD matrix for both directions were then combined to obtain a single matrix for both directions for each category of vehicle.

5.0 DEVELOPMENT OF BASE MATRIX

The vehicles were categorized in three broad classes to develop base matrix i.e., Cars, Public Transport and Heavy Vehicles. The base matrixes were developed using HERMES (HEuRistic Matix Estimation Solution) tool build on many years of research conducted in the UK. The detail of tool is provided in the processing sections.

5.1 Background of Matrix Tool

The main objective is to use Matrix Tool that can create transport demand matrices for use in Pakistan based on survey information. The HERMES tool is developed based on public transport survey information and extensively used in UK for development of travel demand matrices. One of the advantages of this method are that it allows us to merge estimates from multiple data collection sites (which may have conflicting observations) whilst taking account the differing reliabilities inherent in each survey location. The method will also differentiate between structural zeros and observed zeros, making best use of the data given statistical robustness of the data.

5.2 Process flow of the Matrix Tool

5.2.1 Overview of Methodology

This section described the logical process flow within the tool, expanding on the earlier overview and cross-referencing back to earlier methodology sections where appropriate. This will describe the core structure of the code behind the tool. Inputs to the tool (configuration settings, location of survey files &etc) will be input into an interface in a Microsoft Excel workbook, this interface will use VBA to begin the execution of the python program once all settings have been entered. This execution of the python code will either be running via an installed python interpreter (recommended) or via pre-compiled code if python has not been installed on the user's computer. Key settings will include an index to each survey file used in the build process, indicating which cordon it belongs to and any site-specific information for use in variance calculation. The workbook will also provide a link to the highway assignment version file for use in deriving information about OD paths. Once all inputs are complete the user may begin the build process which will complete the following steps.

1. Pick the first vehicle type in order (e.g. Car) – all survey information and assignment information below will relate to that vehicle type.
2. Combine OD records at each location. This step will also include:

- a. Identifying for each site, which OD pairs are likely to be observed in each direction
 - b. Expanding OD data to count values.
 - c. Calculating variances for each trip estimate
 - i. Calculating variances for transposed records separately and then combining.
 - d. Calculating indexes of dispersion for each trip estimate.
 - e. Calculating an average index of dispersion for each location (weighted by trip estimates) for use with observed zeros at each location.
3. Loop through OD pairs and find which locations a trip may have been observed at according to the highway assignment information.
- a. For each OD, loop over the possible paths found by the assignment, follow the process to create a merged estimate making best use of survey data and routing information.
 - b. Output final trip-volume for the OD pair into a temporary matrix for this vehicle type.
4. Output final Matrix for this vehicle type.
5. Move to next vehicle type and go back to step 2.
6. Finally save the trip matrices for each vehicle type in Visum Binary matrix format (.mtx) ready for assignment by the user.

In practice the different vehicle types may be done in parallel – this decision will partly depend on implications for run-time and not wanting to over complicate the final code.

5.2.2 Inputs

As discussed above, the tool will require various inputs lists them out for clarity:

- Survey record information: based on the examples provided so far ('Location 166 OD Matrix.xlsx' and 'Location 167 OD Matrix.xlsx') this contains three tabs
 - Counted traffic volumes in direction 1
 - Counted traffic volumes in direction 2
 - Survey OD records, presented in the form of an OD matrix by vehicle type:
 - Car / Jeep / Pickup
 - 2-Axle / 3-Axle
 - 4-Axle / 5-Axle / 6-Axle / Tractor Trolley
 - Hiace / Mini Buses

- Large Buses
- Pickups
- It is notable that this does not correspond directly with the counted volumes. The user will need to provide as input (preferably after consultation with the survey companies) a correspondence between the survey count-columns and the matrix vehicle types (for example is the ‘pickup’ vehicle type included in two matrices, or is the first reference a typo?).
- It is also notable that in the example data the OD matrices for Hiace / Mini Buses and Large Buses are empty / full of “#VALUE!” remarks in the excel file. The tool will initially be designed to discard such data.
 - More recent example data does not have this issue, clarification on final data format will be required.
- Finally, it is noted that while the total traffic has been counted by direction (e.g. northbound / southbound) the OD matrices have been presented combined. This not only means we do not know which OD cells are the result of transposed records (if any), it also means we do not know which are the result of a northbound survey or southbound survey. This will make derivation of site-specific expansion factors more difficult. As discussed in **Error! Reference source not found.**, information from the highway assignment will be used to allocate OD pairs to each direction in order to derive expansion factors.
- Cordon definitions – which survey sites belong to which cordon (or if a 1 to 1 correspondence is to be used).
- Site specific information for estimation of count variance. See **Error! Reference source not found.** in section **Error! Reference source not found.** for details. Global default values will be provided by the tool, however where the user has further information it is preferable to enter location specific information.
- Site specific correction factors (by default these will be 1). As the model is intended to represent an average weekday, it is preferable to correct for seasonable variation in traffic flow by use of an adjustment factor.
- A Visum network file that is assignable.
 - Ideally this will be the final network, however in practice it will likely be an early draft. The tool however will be constructed so that a final rebuild can be done automatically within minimal time prior to running a matrix estimation process.

- For the purposes of building the tool, an initial draft network with connectivity will be required.

5.2.3 Outputs

The key output of the tool will be OD matrices (by vehicle type) merged from the input data. However, it may be valuable to provide intermediate outputs for the purposes of checking via a geographical interface. Scoping out of such features will be considered after the core functionality is in place.

5.3 Trip Types

When considering various routings through the Highway Network, we can describe each OD pair (A to B) as having paths categorised into one of the following trip-types described in this section. The first few types are trivial examples with complexity gradually increased until type F being a more general case.

5.3.1 Type A Movement

In Figure 5.1, A is the trip origin, 1 is the survey location and B is the trip Destination

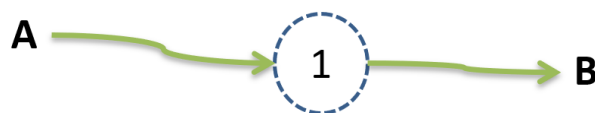


Figure 5-1: Type A Movement

In the above example origin-zone A is within survey cordon 1, and so all trips going to sector B are observed in the cordon. No merging of trips is required for this type of movement. Equivalently the destination zone could be within the survey cordon and the origin zone outside.

5.3.2 Type B Movement

In Figure 5.2, 2 survey locations are located on the route between A and B.



Figure 5-2: Type B Movement

In the above example, the trip origin and trip destination are entirely contained within survey locations. Hence all trips travelling from zone A to zone B are observed in both cordons. A merge will be required combine the two sets of observations.

5.3.3 Type C Movement

In Figure 5.3, we have two paths between A and B, one of which passes through survey location 1, and the other bypasses the location.

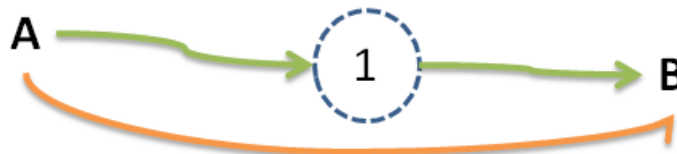


Figure 5-3: Type C Movement

Information from the assignment can be used to infer the probability of a traveller using green-path (via the survey location) vs the orange path (bypassing the survey location). For example the assignment may tell us there is an 20% probability of trips from A to B bypassing the cordon, and therefore we need to expand the surveyed estimate by a factor of $(1/(1-0.2))$ to get an estimate of the full number of trips. This should ensure that when the OD pair (A to B) is assigned back on the transport network with this modified volume, the volume on the green-path/roads will more closely match that observed count.

5.3.4 Type D Movement

This example is a natural extension of Type C, here we have two paths that are may be observed, as shown in Figure 5-4. For this type of movement, we would first expand the records at survey locations 1 and 2 separately, as if they were each a type C movement independently. We would then merge the two estimates to gain an overall combined estimate of travel.

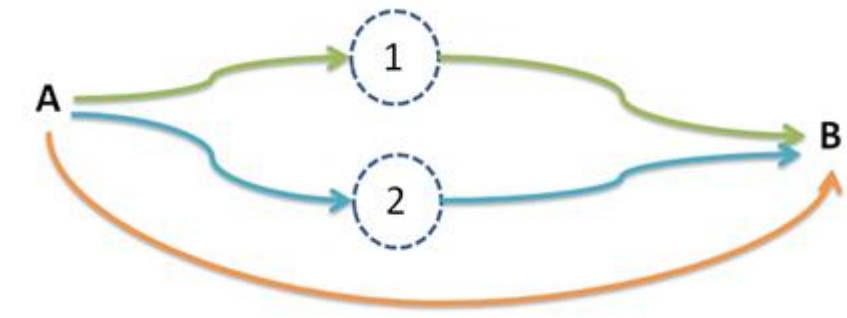


Figure 5-4: Type D Movement

The index of dispersion will also need to be expanded by the same path-factor used to expand trip estimates. Using the formula $\text{Var}(cX) = c^2 \cdot \text{Var}(X)$ for constant c , the index of dispersion will also be scaled by c

$$I_{new} = \frac{p^2 * \sigma_1^2}{p * T_1} = \frac{p * \sigma_1^2}{T_1} = p * I_{old}$$

5.3.5 Type E Movement

Figure 5-5 shows the example which is a further extension on types C and D – here one of the paths from A to B passes through two different survey cordons, while a separate path passes through cordon 3, and a further path is unobserved.

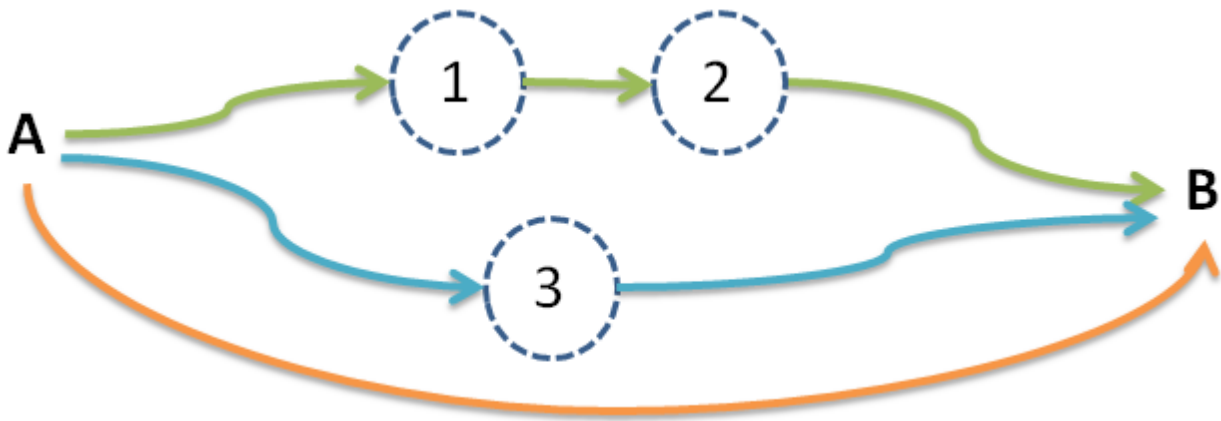


Figure 5-5: Type E Movement

For this example, the tool would first merge the estimates from the cordons 1 and 2 before expanding based on path proportions. We would then expand up the two estimates based on path proportions (as in type D), and then merge the two estimates.

5.3.6 Type F Movement

This example is a final extension, although further extensions in complexity are possible, they will amount to linear combinations of the previous examples. For this example, four distinct paths are shown; red, green, blue and orange paths. They pass through survey locations 1, 1 and 2, 2 alone and neither survey location respectively.

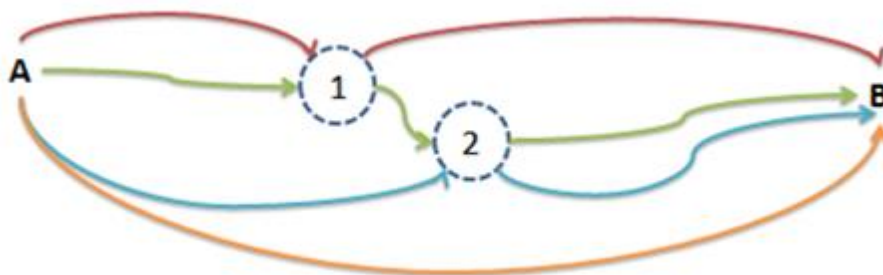


Figure 5-6: Type F Movement

To combine the estimates for this OD pair, we will make use of the assignment routing information. The assignment will give us an estimate of the proportion of trips at each survey cordon that could have been surveyed at both (i.e. percentage of trips following a green-path), and

the proportion of trips that would be surveyed only at one cordon – or none. This information can be used to separate the paths, as shown in Figure 5-6.

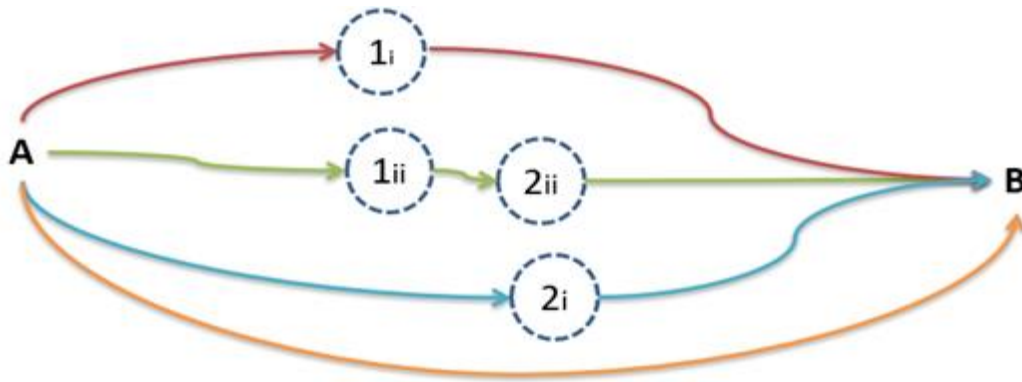


Figure 5-7: Type F Movement-Separate Paths

From this information we can select the proportion of interview-trips relating to the green path from cordons 1 and 2, creating trip-estimates from the pseudo cordons 1ii and 2ii. These estimates are scaled down versions of the original expanded estimates. These estimates can then be merged using the standard formula and then we expand that estimate from the green path using the assignment information again, similar to a type C movement. Likewise, for the red and blue paths we will expand those estimates based on path proportions as in the type C movement. Finally, the estimates from each path will be merged to provide an overall estimate of demand volume from A to B.

5.3.7 Other Trip Types

In survey matrix building, general practice is that most OD pairs will have routings that are some variation of Type F, extended with further survey locations. As such rather than trying to produce code with explicit rules for each survey type, generalized rules will be created that the tool will be able to combine automatically as needed based on the paths identified in the routing. The following technique is used to create merged estimates for each OD pair based on the routing information:

- Split the cordons into pseudo-cordons so that no pseudo-cordon used by more than one path.

- Merge along each path (e.g. cordon 1ii and 2ii in the example of type F), to create a merged estimate for each path.
- Expand the trip-estimate from each path based on the probability of a journey using it.
- Merge the trip-estimates from all paths together using indexes of dispersion (or merged indexes where appropriate).

5.4 Survey Locations

Figure 5-8 shows the survey locations. OD Survey with counts were conducted on 218 points located all over Pakistan on major highways and motorways.

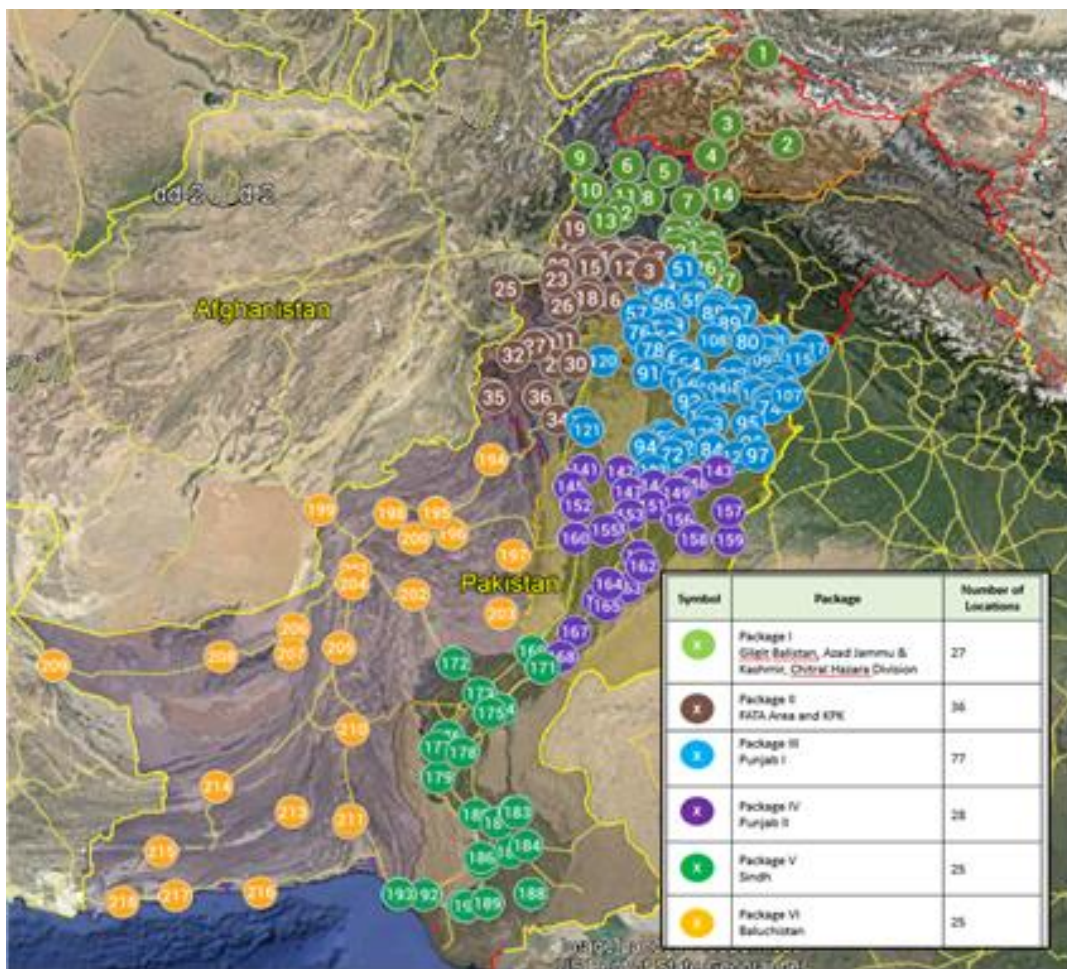


Figure 5-8: Survey Locations

5.5 VISUM Model

VISUM is a comprehensive, flexible software system for transportation planning, and travel demand modeling. As the first step, traffic analysis zones, and roadway network was coded in VISUM. The attributes related to road speed, travel time, and lengths were coded for each roadway section. Figure 5-9 shows the snapshot of the coded VISUM Network. Each roadway section is shown in different colors and traffic zones were codes according to their ID.

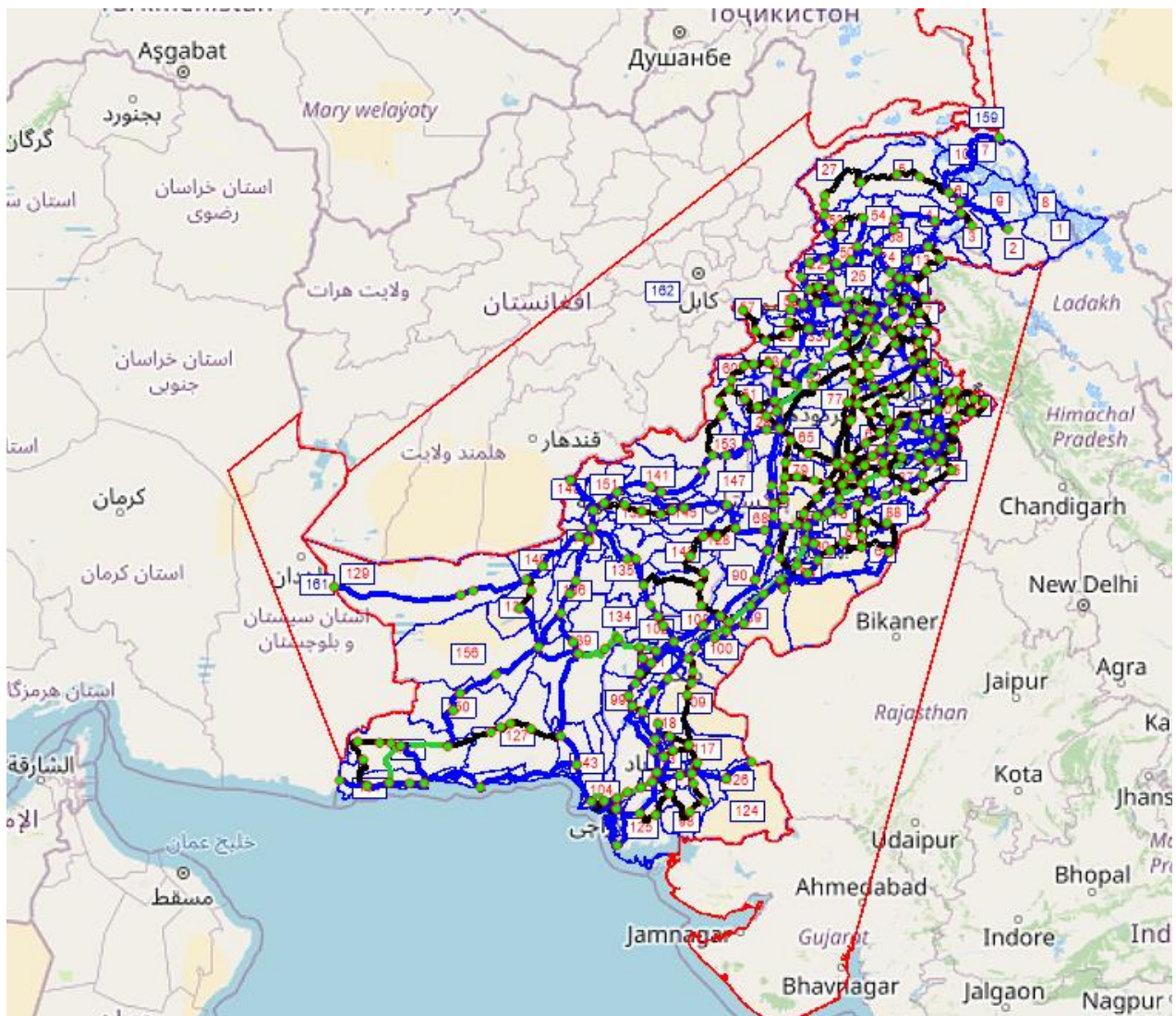


Figure 5-9: Coded VISUM Network

5.6 Matrix Tool Front End

Figure 5-10 shows the front end of the Matrix Tool to develop base demand matrices. The input files consist of following sheets:

- Zone List File (Zonelist.CSV): Contain all zone ID and Names
- Directory of Survey Data: OD Matrix and Traffic Counts data files for each location
- Directory of Path Files: Path files for all modes of Traffic. In our case it is Cars (C), Trucks (T), and Public Transport (X). The files are obtained from the VISUM model.
- Directory of Final Matrices: Identify the folder where we want to save the final matrices
- Use Previous Survey Data Temp File: If run the tool early, we can use the tempary files already developed in previous runs to save time. Otherwise use No here.

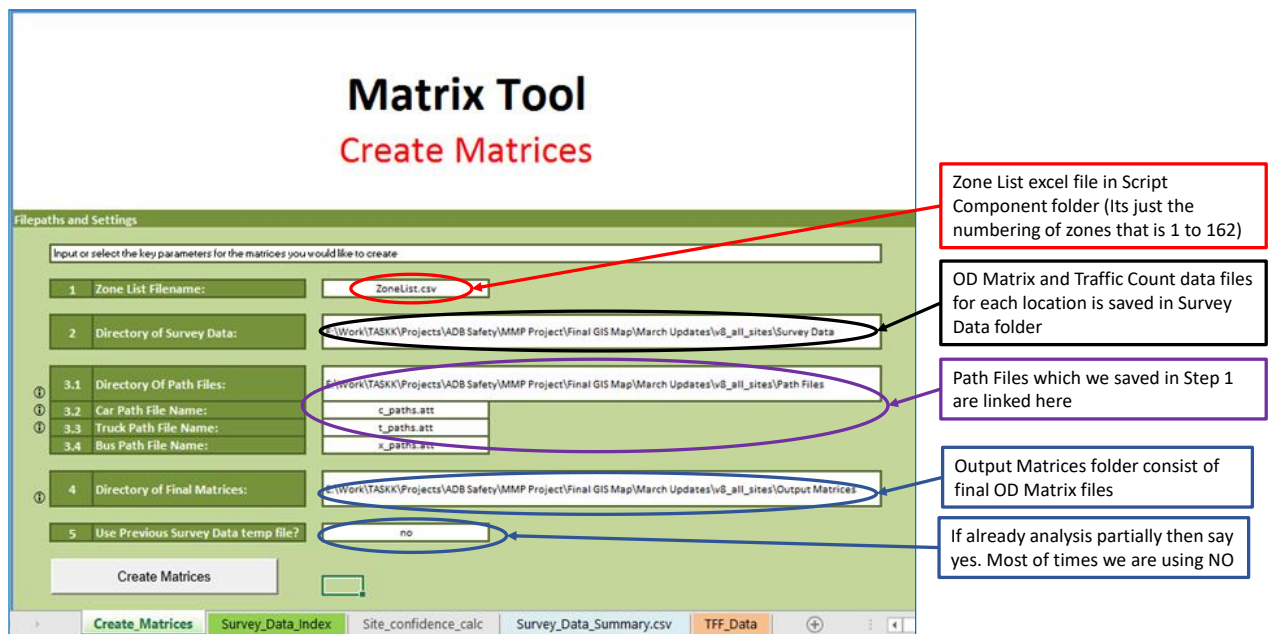


Figure 5-10: Front End of Matrix Tool

5.7 Final Base OD Matrices