

Operator Assisted Drive Test Report

Birbhum, Nadia & Murshidabad Districts, West Bengal

August, 2024 (RO, Kolkata)

Key Performance Indicators (KPIs):

The following TSPs could not meet the KPIs benchmark as stated below—

AIRTEL - Rx Quality in 4G (SINR) network.

BSNL- Drop Call Rate in 2G & 3G network, Rx Quality in 2G & 3G (Ec/Io) network.

VIL- Rx Quality in 4G (SINR) network.

RJIO- Rx Quality in 4G (SINR) network.

The Operator Assisted Drive Test has been carried out by Regional Office, Kolkata with the help of Service Providers in Birbhum, Nadia and Murshidabad Districts and surrounding areas including National Highways 12 & 312 on 21st and 22nd August 2024 from 08.30 AM to 07.45 PM. The drive test covered drive route of 509 KMs (approx) over a period of two days. Approximately 523 + calls were made for each of the 7 networks: three 2G networks, one 3G network and three 4G networks covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

Birbhum district is an administrative unit in the Indian state of West Bengal. It is the northern most district of Burdwan division—one of the five administrative divisions of West Bengal. The district headquarters is in Suri.

Murshidabad district is a district in the Indian state of West Bengal. Situated on the left bank of the river Ganges, the district is very fertile.

Nadia district is a district in the state of West Bengal, India. It borders Bangladesh to the east, North 24 Parganas and Hooghly districts to the south, Purba Bardhaman to the west, and Murshidabad to the north.

The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services in terms of:

Voice: Coverage, Quality, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

Data: Download Throughputs and Data File Success Rate.

Voice Tests: Calls were made for 90 secs duration with wait time of 5 secs between call in all technologies. Three 2G networks, one 3G network, Three 4G networks covering 4 unique TSPs were tested.

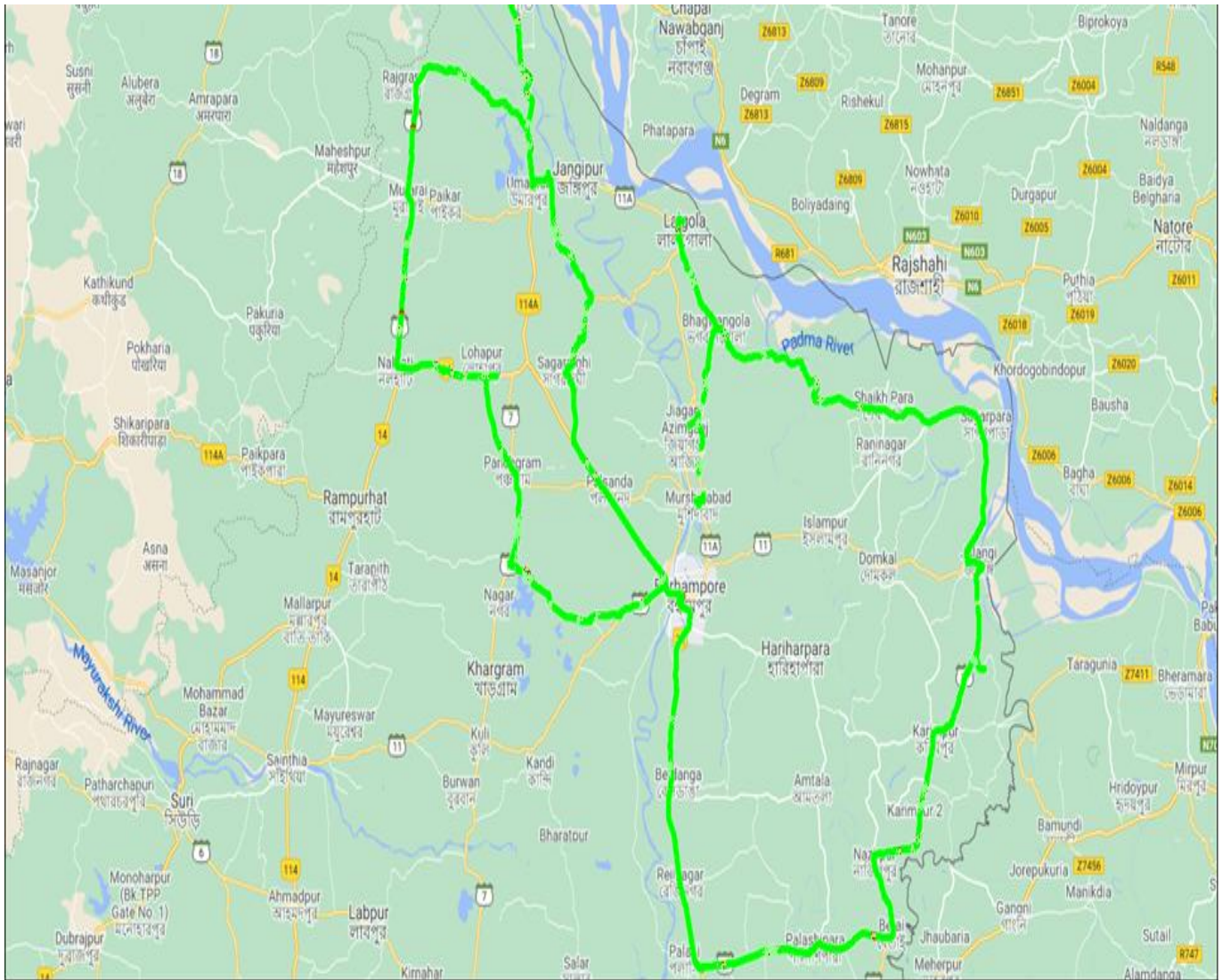
Data Tests: Dynamic Data Service Testing was performed along same route in all technologies. 500 KB file for 2G, 20MB file for 3G and 40MB file for 4G were downloaded from FTTP server in TSP's own server. Static Data Service Testing was also performed. Three 2G (Lock Mode) networks, one 3G (Lock Mode) network, Three LTE (Lock Mode) networks covering 4 unique TSPs were tested.

Service	Static Data Service Testing- Specifications
Download	2G (Locked) - 500KB, 3G (Locked) - 20 MB, 4G (Locked) - 40 MB
Upload	2G (Locked) - 100KB, 3G (Locked) - 5 MB, 4G (Locked) - 10 MB
Web Browsing	3 links of e/m commerce website www.amazon.in, www.flipkart.com and PayTm
Video Steaming	130 secs Clip
Latency	32 Bytes on www.google.com

Technology/ TSP	AIRTEL	BSNL	RJIO	VODAFONE-IDEA
2G	YES	YES	NO	YES
3G	NO	YES	NO	NO
4G	YES	NO	YES	YES
TOOL USED	TEMS	NIMO	X-CAL	TEMS

Overview

Voice & Dynamic Data Test Drive Route



Drive Routes: Birbhum, Nadia and Murshidabad Districts

DAY-1– Berhampore DM Office – Bhabta Netaji High School – Plassey Station Bus Stop – Palashipara Bus Stand – Karuigachi Post Office – Betai Bazar Bus Stop – Nazirpur Bus Stop – Karimpur Rural Hospital – Hogalbaria Bus Stand – Jalangi Bus Stand – Sagarpara High School – Seva Varati B.Ed. College Nabipur – Hurshi Primary Health Centre – Bhagawangola BDO Office – Lalgola Police Station - Lalgola College – Jiagunj Bus Stand – Murshidabad Railway Station

DAY-2 – Berhampore Bus Stand – Sagardighi Bus Stand – Monigram High School – Jangipur Super Speciality Hospital – Umarpur Bus Stand –Chander more Bus Stand– Dhuliyon Bus Stand – Farakka Station More – Bagdabra Primary School – Rajgram Bus Stand – Murarai Bus Stand – Nalhati Bus Stand – Sherpur High School – Murshidabad Medical College

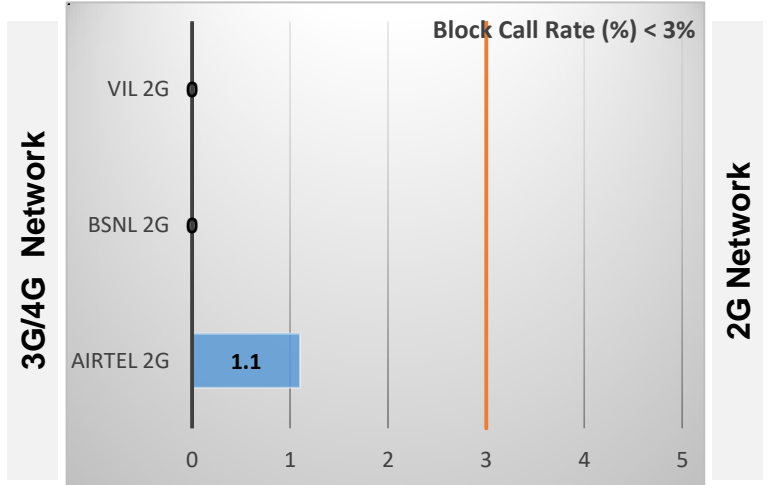
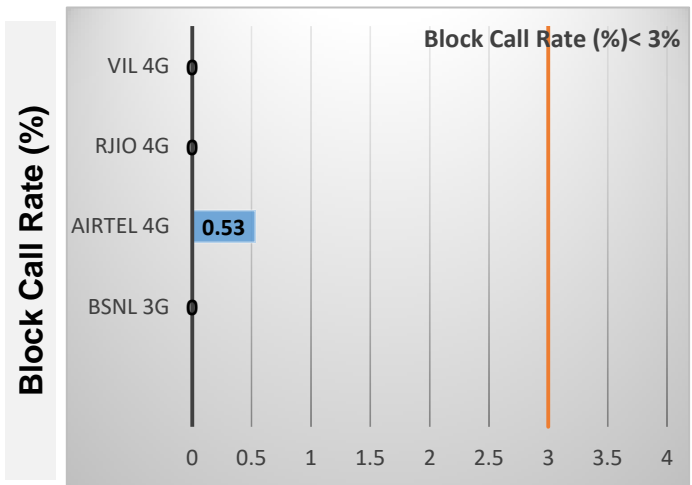
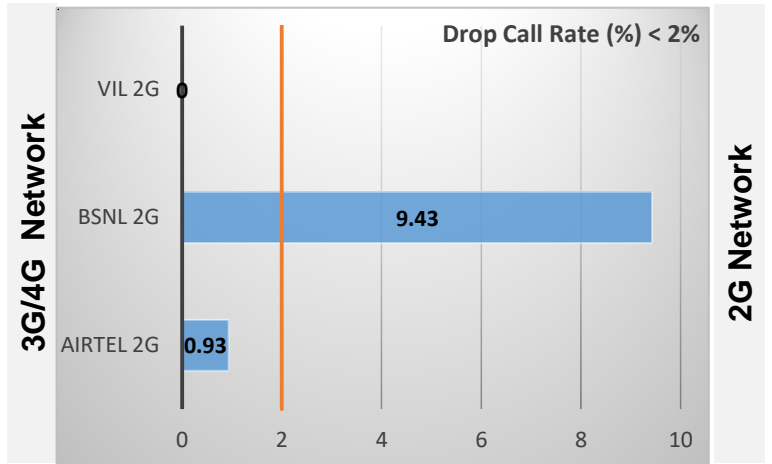
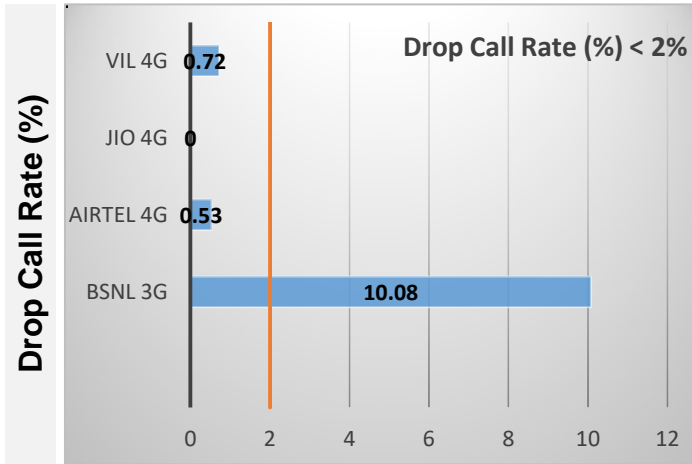
Data Service Test- Static Locations

Static Locations
DM Office Murshidabad
Berhampore Bus Stand

Voice Calls

Key Observations

QoS compliance of the TSPs for Voice across technologies 2G/3G/4G-VoLTE:



KPIs	2G			3G	4G-VoLTE		
	AIRTEL	BSNL	VIL	BSNL	AIRTEL	RJIO	VIL
Drop Call Rate %	0.93	9.43	0	10.08	0.53	0	0.72
Block Call Rate %	1.10	0	0	0	0.53	0	0

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%) except BSNL (2G & 3G) network.
- b) All TSPs have met the 3% QOS benchmark of Block Call Rate (BCR%) except BSNL (3G) network

Coverage

a) Percentage of coverage samples for 2G \geq -85 dBm.

TSPs	2G		
	AIRTEL	BSNL	VIL
Coverage %	88.77	56.27	90.69

b) Percentage of coverage samples for 3G \geq -90 dBm & 4G \geq -110 dBm.

TSPs	3G	4G		
	BSNL	AIRTEL	RJIO	VIL
Coverage	31.24	97.30	99.04	93.03

Summary

City Level Summary- Voice

Voice Call	2G		
	AIRTEL	BSNL	VIL
Call Attempt	544	412	522
Blocked Call Rate (%)	1.10	0	0
CSSR% (Accessibility)	98.90	90.04	100
Drop Call Rate (%)	0.93	9.43	0
Mobility HOSR (%)	99.97	95.0	98.54
Rx Quality (%)	96.54	89.47	95.66

Voice Call	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Call Attempt	145	569	536	555
Blocked Call Rate (%)	0	0.53	0	0
CSSR% (Accessibility)	82.06	99.47	100	100
Drop Call Rate (%)	10.08	0.53	0	0.72
Mobility HOSR (%)	100.0	99.6	100	99.48
Rx Quality (%)	68.80	94.05	91.0	85.35

Summary-Data Services Dynamic

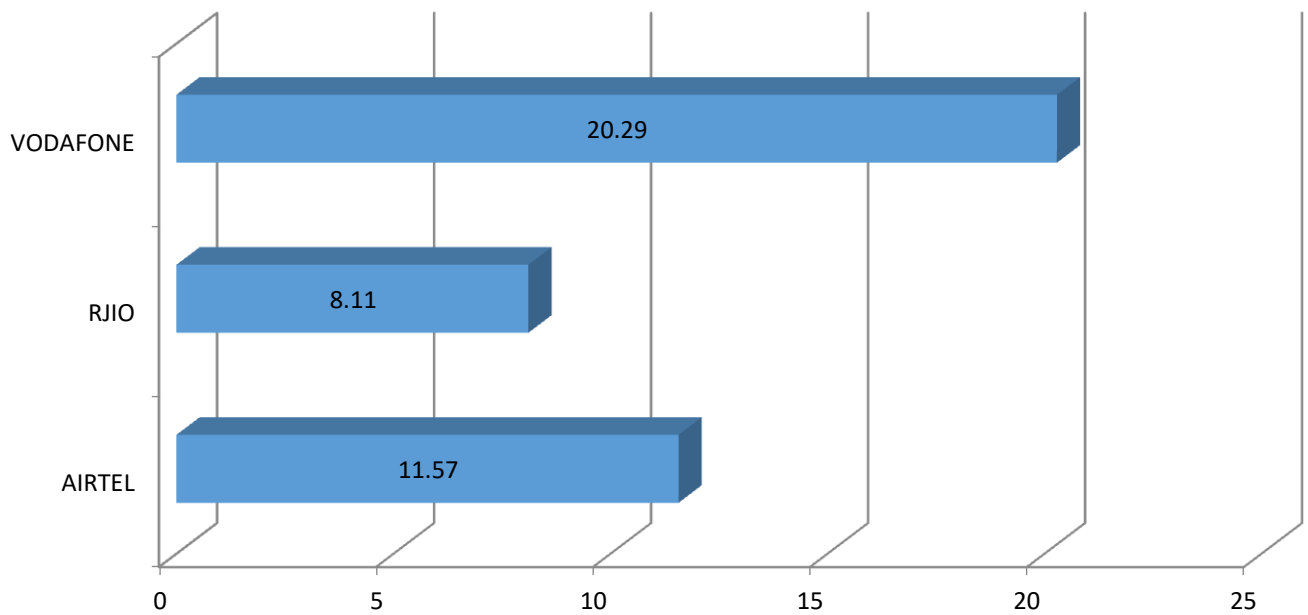
Key Observations

Dynamic Data was tested for 509 Kms. Download Throughput was tested.

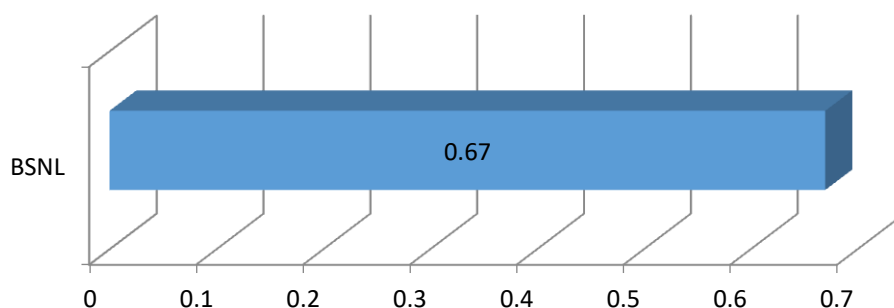
Data Download Performance (Average Throughput in Mbps) - Dynamic Data Testing

4G/3G Network:

4G-Dynamic Download Throuhput (Mbps)



3G-Dynamic Download Throuhput (Mbps)



Summary-Data Services Static

City Level Summary-

Average Data Services Static	3G/ 4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	1.93	19.07	31.34	12.07
Upload Throughput in Mbps	0.52	3.92	9.18	5.56
Video streaming delay (sec)	1.18	0.17	2.7	1.30
Web Browsing Delay (secs)	11.80	0.82	2.48	40.33
Latency (msec)	2.20	130	51	82.37

Summary-Data Services Static

Location Level Summary-

Location:-DM Office Murshidabad	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	1.78	25.01	20.61	9.28
Upload Throughput in Mbps	0.26	4	11.93	2.12
Video streaming delay (secs)	1.2	0.13	2.5	1.41
Web Browsing Delay (secs)	14.53	0.79	3.1	41.54
Latency (msec)	2.75	46	52	76.07

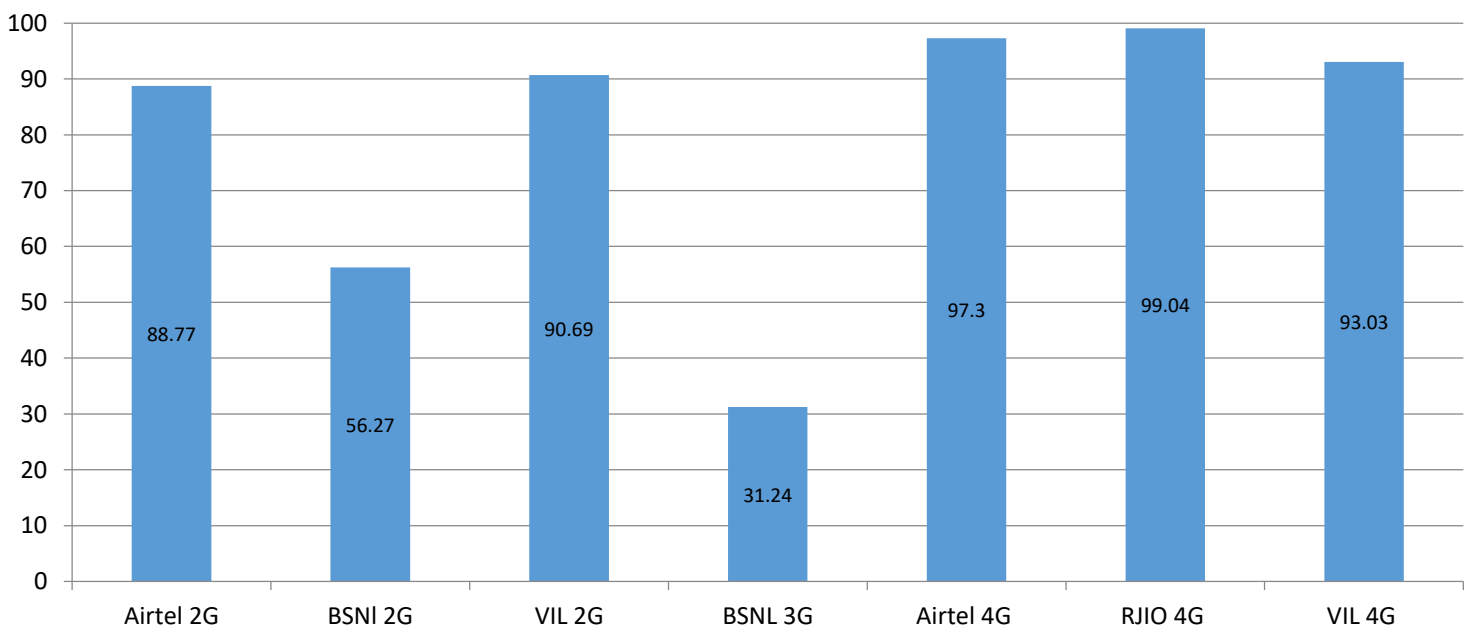
Location:- Berhampore Bus Stand	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in (mbps)	2.08	106.98	42.07	14.87
Upload Throughput in (mbps)	0.79	12.18	6.43	8.99
Video streaming delay (secs)	1.17	0.13	2.9	1.2
Web Browsing Delay (secs)	9.08	0.37	1.87	39.11
Latency (msec)	1.66	71	50	88.67

I. Coverage Details

RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call session. The Coverage rate is calculated on the basis of % of samples in which the Rx level ≥ -85 dBm, RSCP is ≥ -90 dBm & RSRP ≥ -110 dBm. The details are as follows.

TSP	Coverage Rate %
AIRTEL 2G	88.77
BSNL 2G	56.27
VIL 2G	90.69
BSNL 3G	31.24
AIRTEL 4G	97.30
RJIO 4G	99.04
VIL 4G	93.03

Coverage Rate %



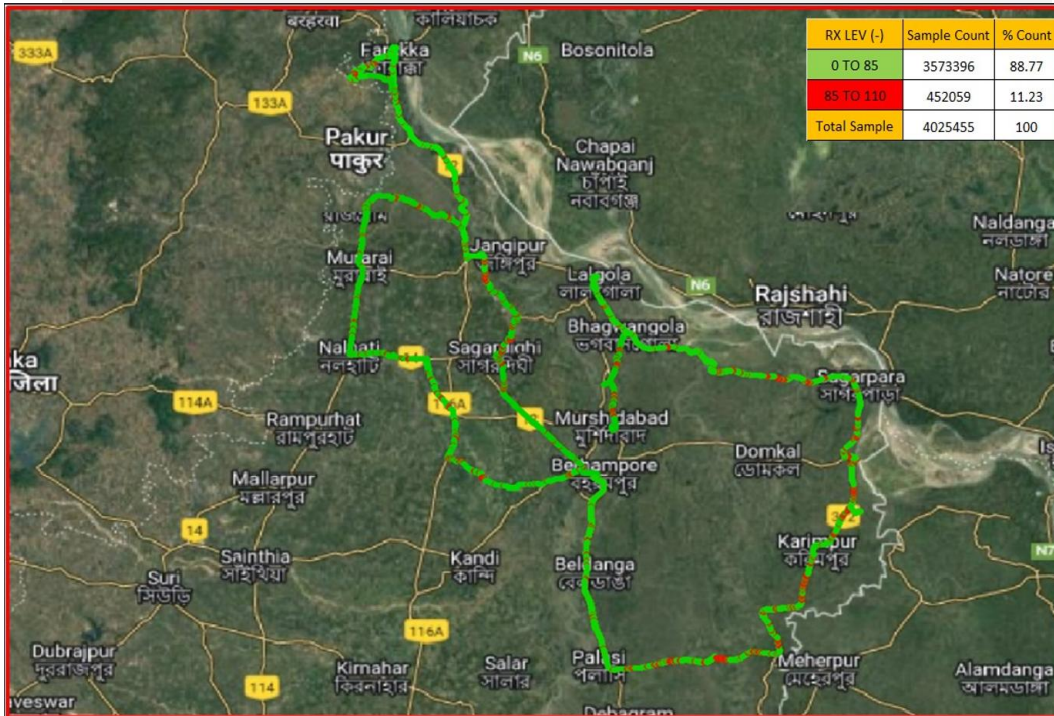
Note- Coverage is the percentage of samples having signal strength more than the threshold value (2G ≥ -85 dbm, 3G ≥ -90 dbm and 4G ≥ -110 dbm). However, these samples are only for the portion of the OADT routes where TSPs have coverage i.e 'no coverage' routes have been excluded.

I. Coverage Details

AIRTEL

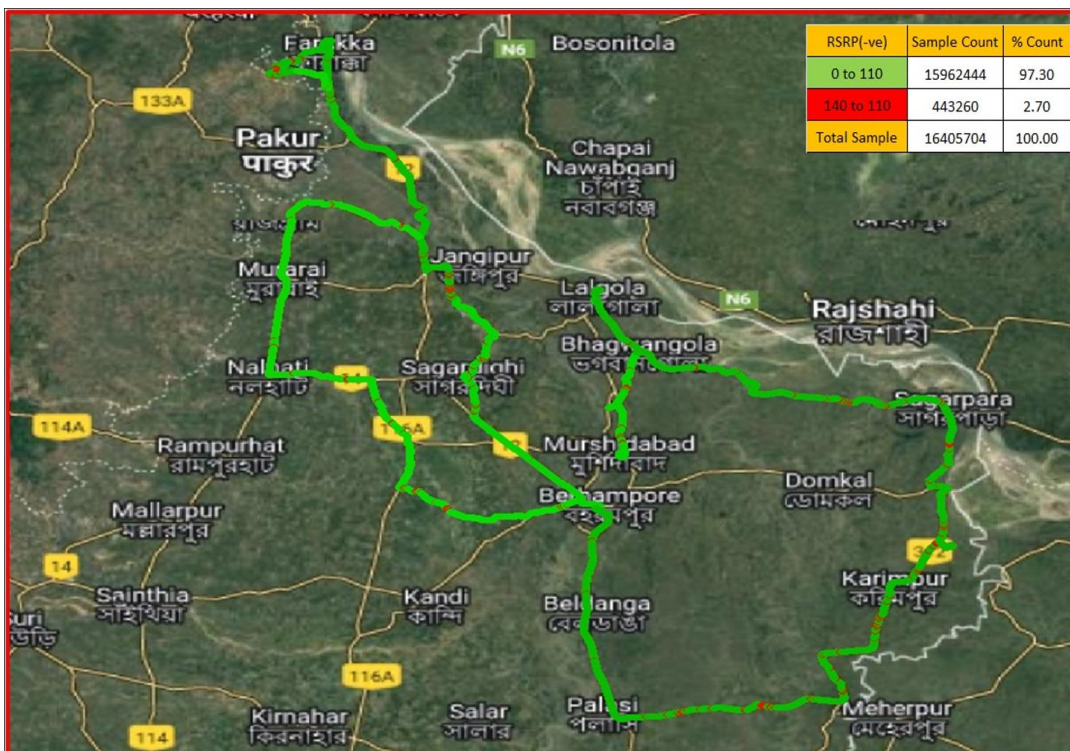
Technology	Coverage Rate %
2G	88.77
4G	97.30

2G



Overall Rx Level	Sample %
[Max >=-75]	24.06
[-75 >=-85)	64.70
[-85 >=-95)	4.99
[-95 >=Min)	6.23
Total	100

4G



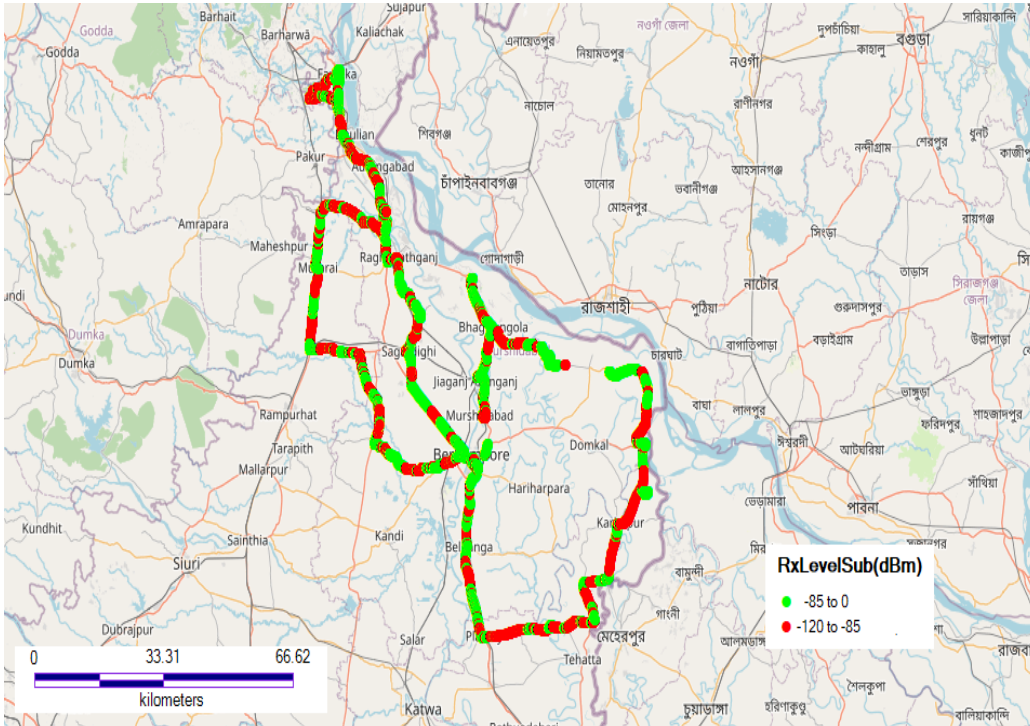
Overall RSRP	Sample %
[Max >=-80]	43.68
[-80 >=-90)	11.25
[-90 >=-110)	42.35
[-110 >=Min)	2.70
Total	100

I. Coverage Details

BSNL

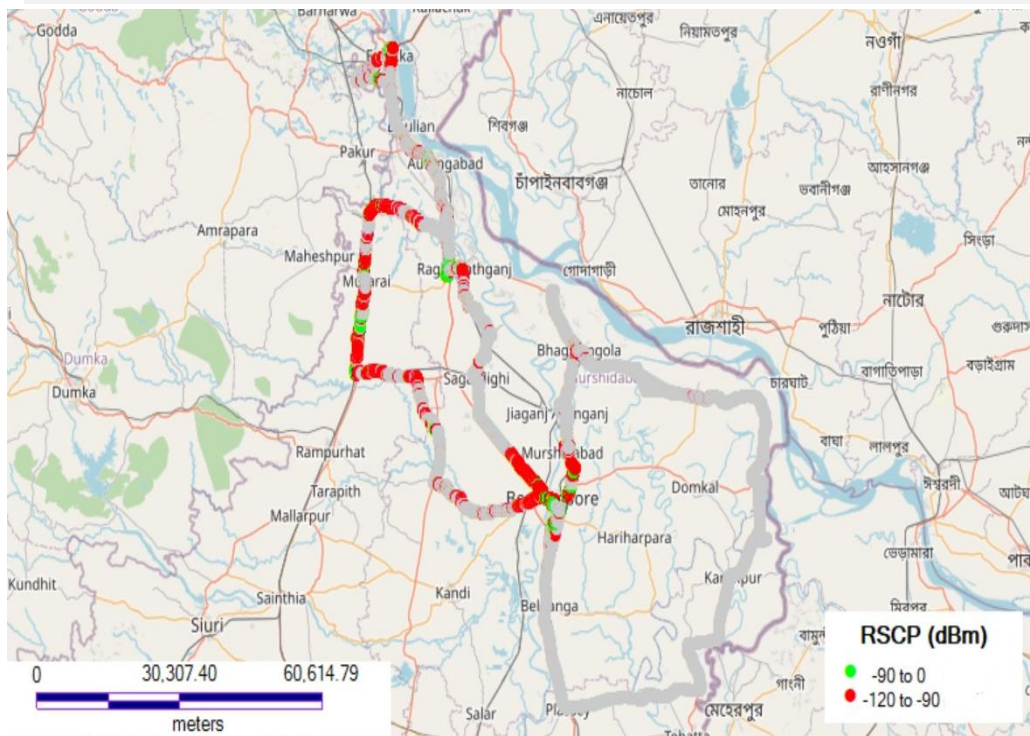
Technology	Coverage Rate %
2G	56.27
3G	31.24

2G



Overall Rx Level	Sample %
[Max >= -75]	28.24
[-75 >= -85]	28.02
[-85 >= -95]	31.29
[-95 >= Min]	12.43
Total	100

3G



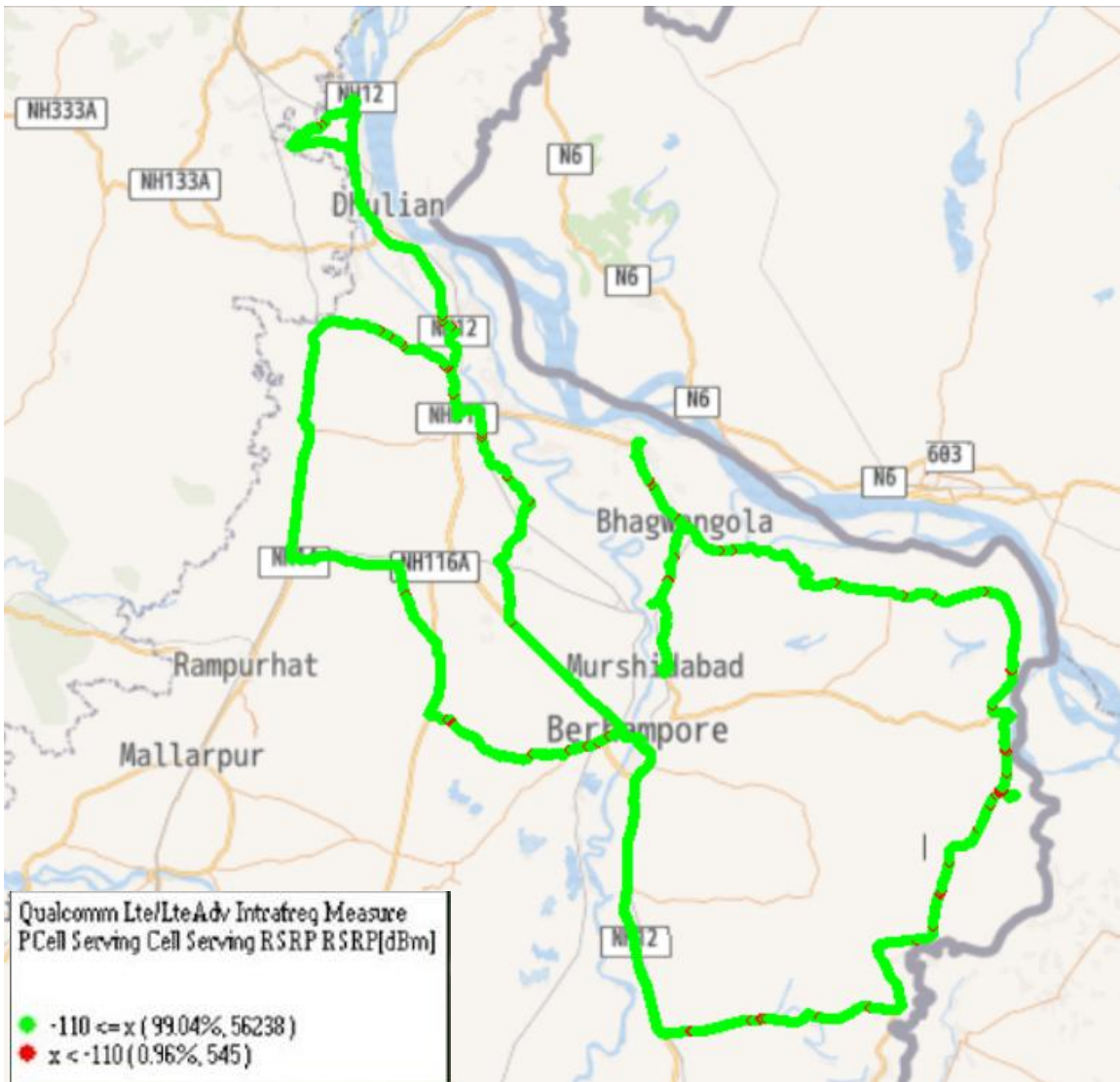
Overall RSCP	Sample %
[Max >= -70]	7.13
[-70 >= -80]	9.78
[-80 >= -90]	14.32
[-90 >= Min]	68.76
Total	100

I. Coverage Details

RJIO

Technology	Coverage Rate %
4G	99.04

4G



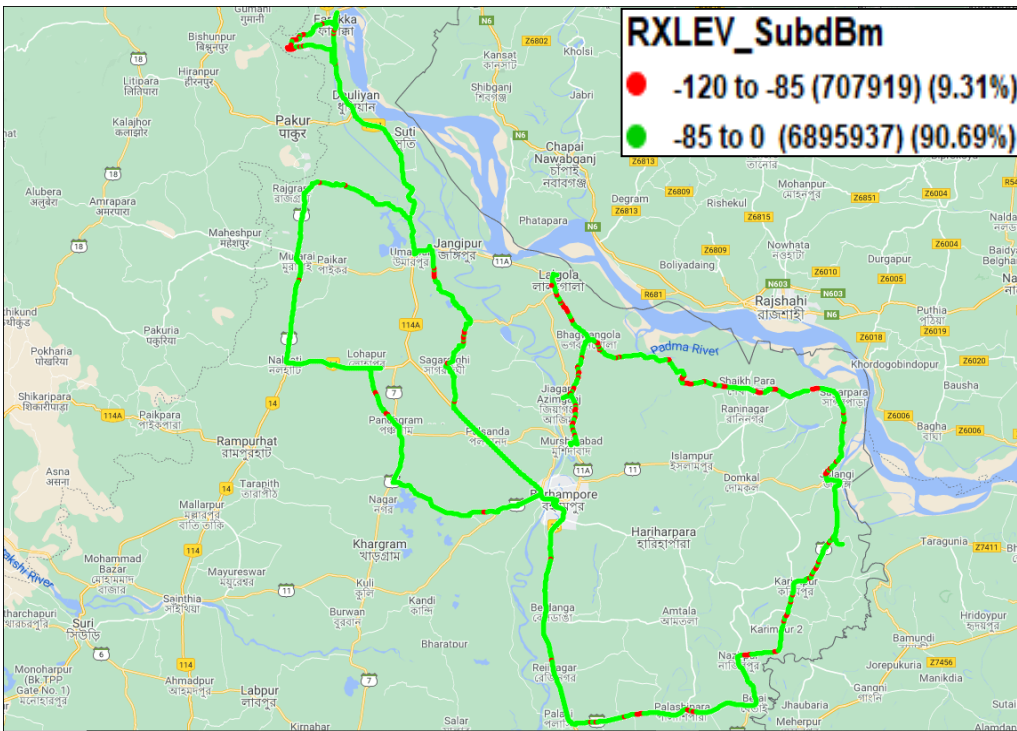
Overall RSRP	Sample %
[Max >= -80]	23
[-80 >= -90)	28
[-90 >= -110)	47
[-110 >= Min)	2
Total	100

I. Coverage Details

VIL

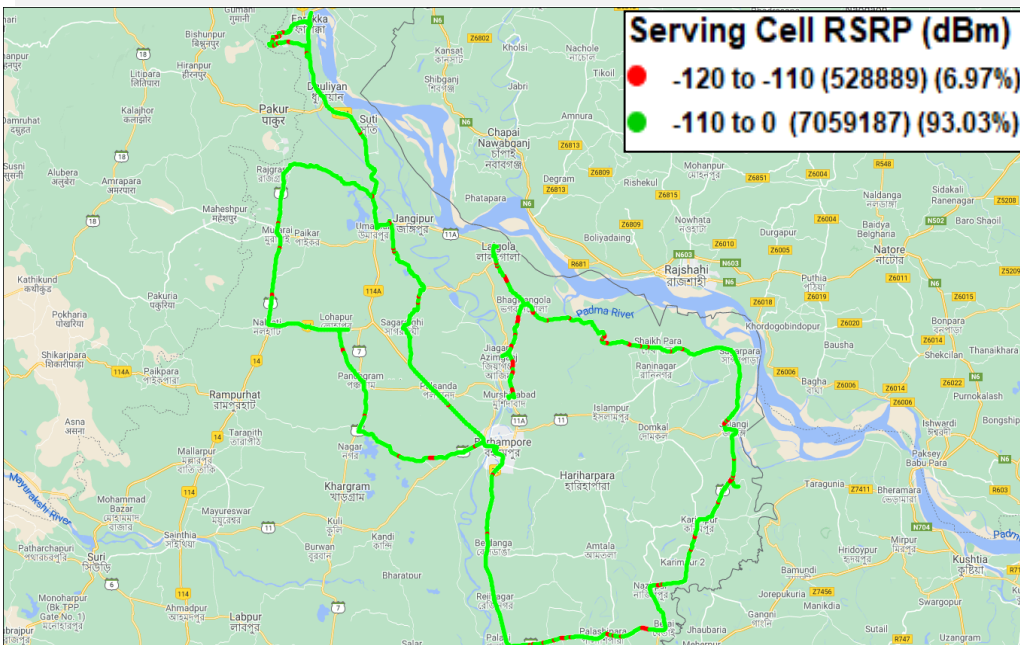
Technology	Coverage Rate %
2G	90.69
4G	93.03

2G



Overall Rx Level	Sample %
[Max >=-75]	54.80
[-75 >=-85]	35.89
[-85 >=-95]	7.97
[-95 =Min)	1.34
Total	100

4G



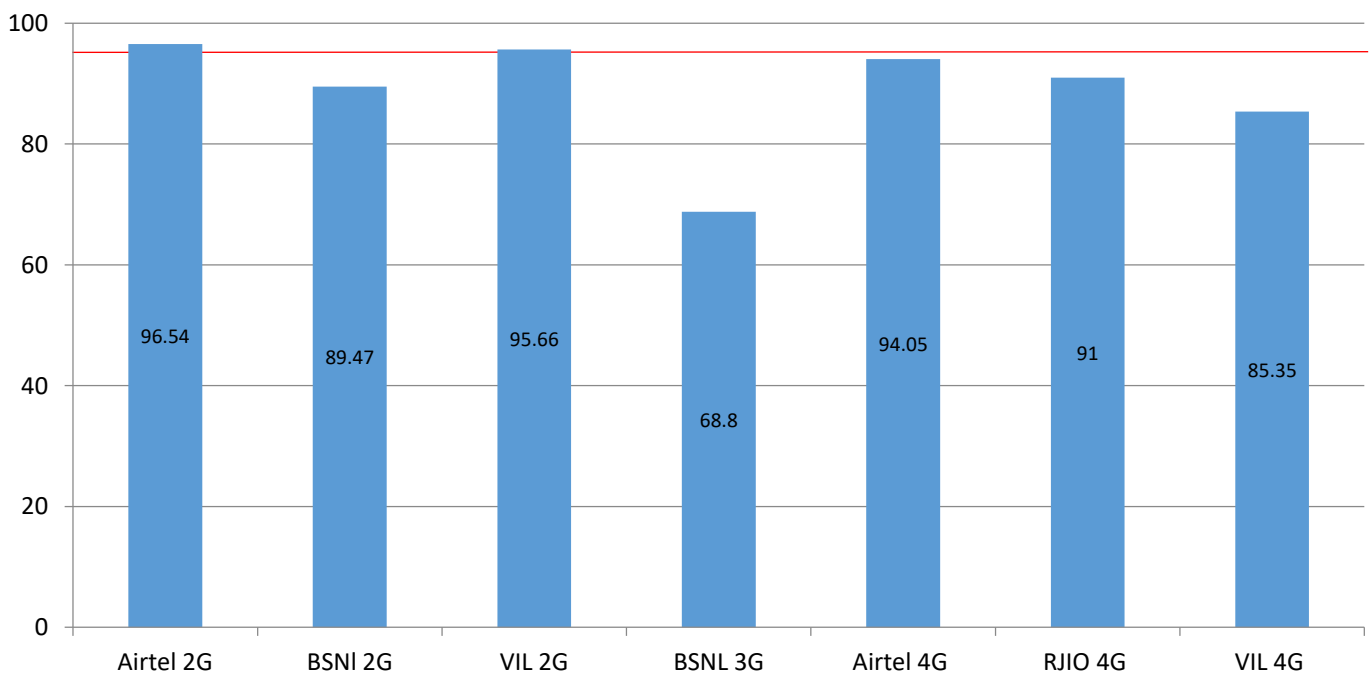
Overall RSRP	Sample %
[Max >=-80]	11.42
[-80 >=-90]	27.49
[-90 >=-110]	54.12
[-110 >=Min)	6.97
Total	100

II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Quality ≤ 5 for GSM, $E_c/N_o \geq -14$ dBm for 3G and SINR > 0 in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be $\geq 95\%$.

TSP	Rx Quality %
AIRTEL 2G	96.54
BSNL 2G	89.47
VIL 2G	95.66
BSNL 3G	68.80
AIRTEL 4G	94.05
RJIO 4G	91.0
VIL 4G	85.35

Rx Quality %

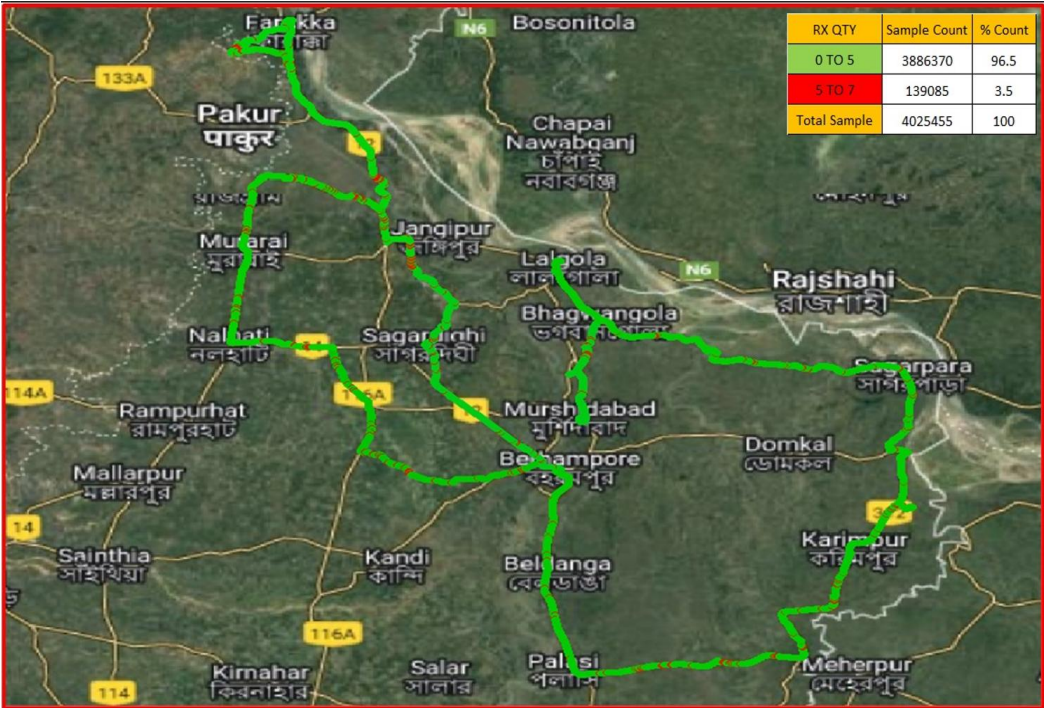


II. Quality Details

AIRTEL

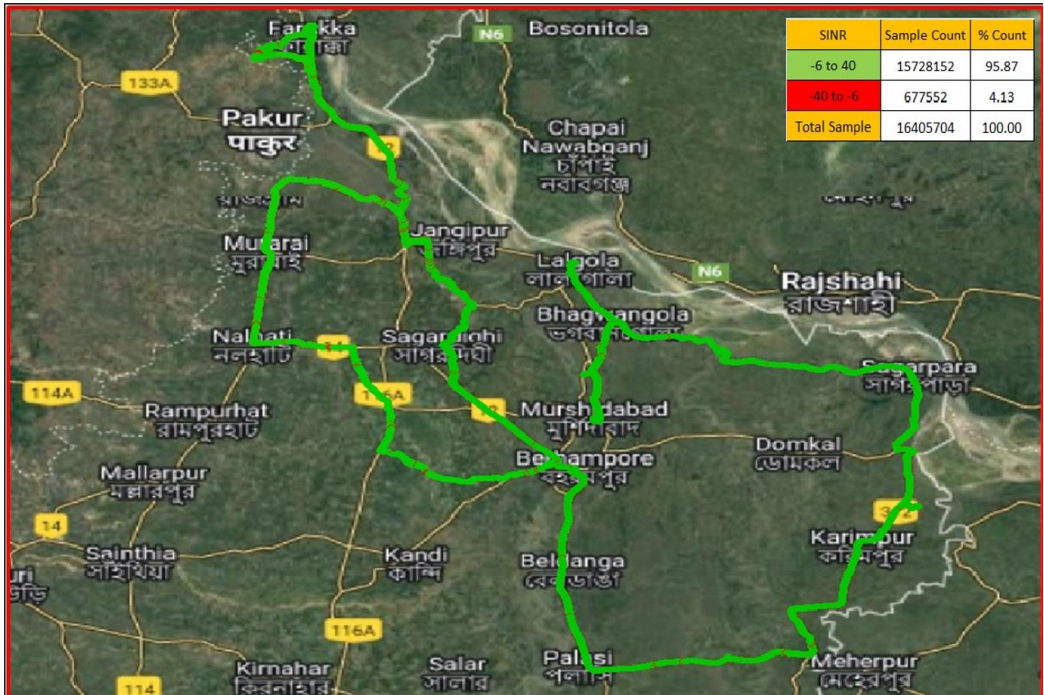
Technology	Rx Quality %
2G	96.54
4G	94.05

2G



Overall Rx Quality	Sample %
(Min <=2)	92.29
(2 <=3)	1.57
(3 <=4)	1.59
(4 <=5)	1.09
(5 <=Max)	3.45
Total	100

4G



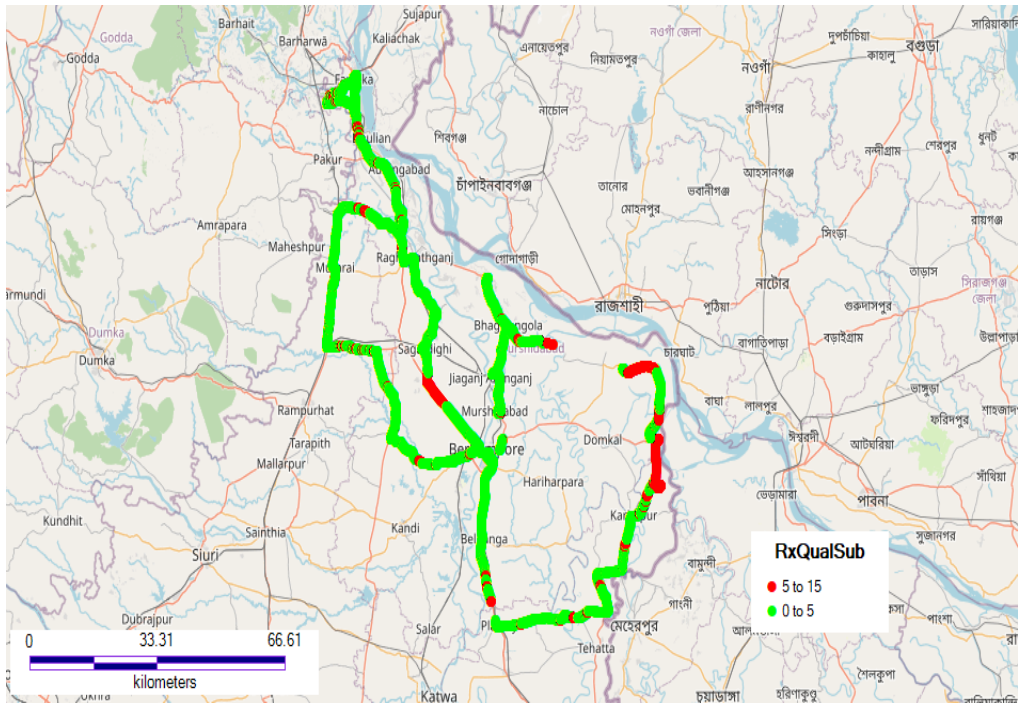
Overall SINR	Sample %
(Min <=0)	5.94
(0 <=5)	40.66
(5 <=10)	23.36
(10 <=15)	20.13
(15 <=Max)	9.88
Total	100

II. Quality Details

BSNL

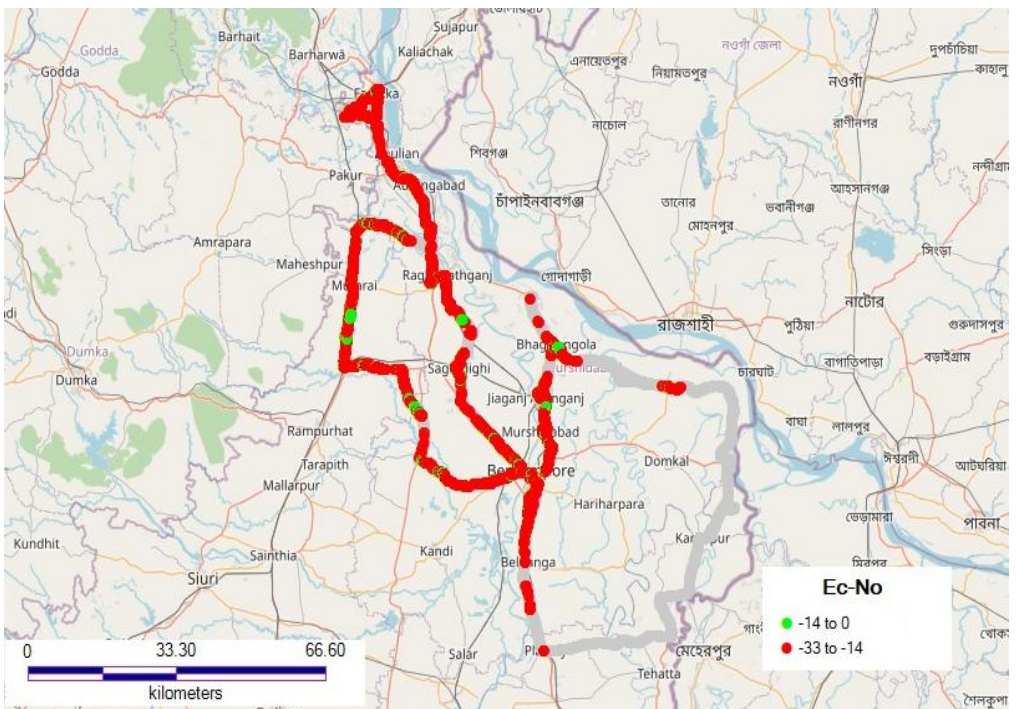
Technology	Rx Quality %
2G	89.47
3G	68.80

2G



Overall Rx Quality	Sample %
(Min <=2)	77.74
(2 <=3)	5.36
(3 <=4)	3.86
(4 <=5)	2.50
(5 <=Max)	10.53
Total	100

3G



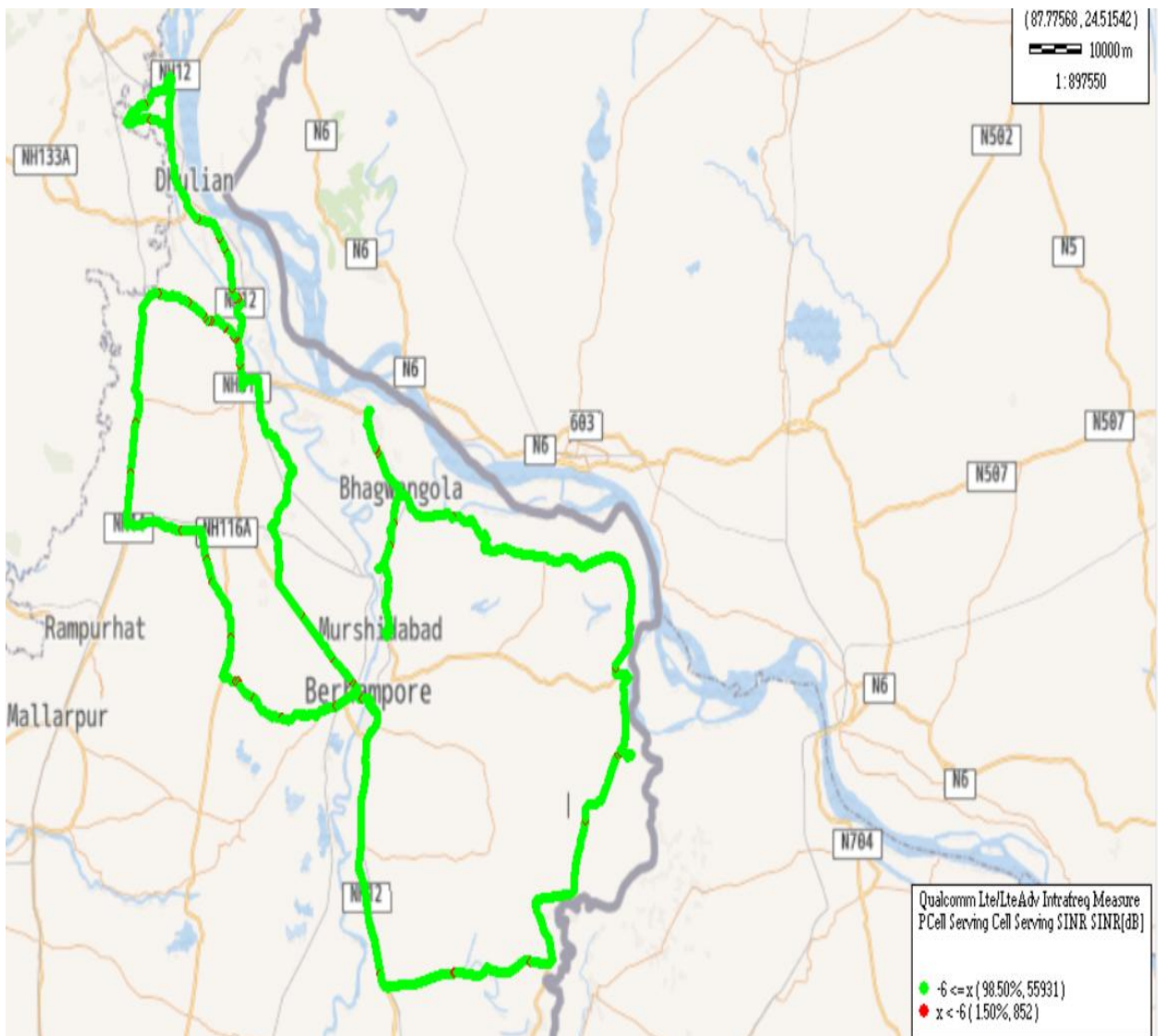
Overall SINR	Sample %
(Min <=0)	3.26
(0 <=5)	9.89
(5 <=10)	22.15
(10 <=15)	33.47
(15 <=Max)	31.20
Total	100

II. Quality Details

RJIO

Technology	Rx Quality %
4G	91.00

4G



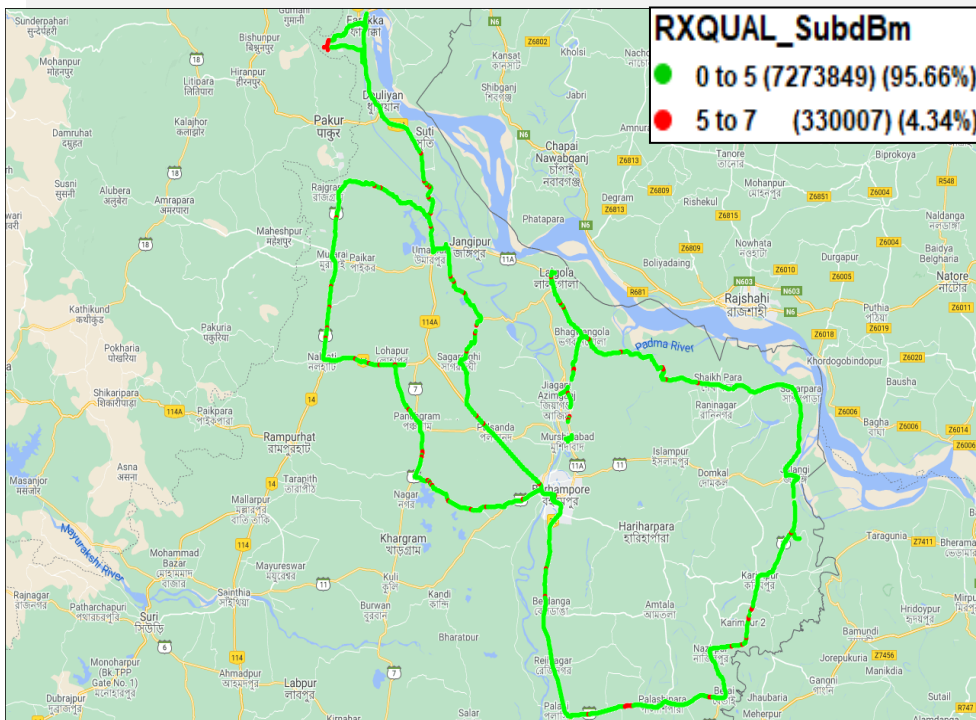
Overall SINR	Sample %
(Min <=0)	9
(0 <=5)	27
(5 <=10)	24
(10 <=15)	20
(15 <=Max)	20
Total	100

II. Quality Details

VIL

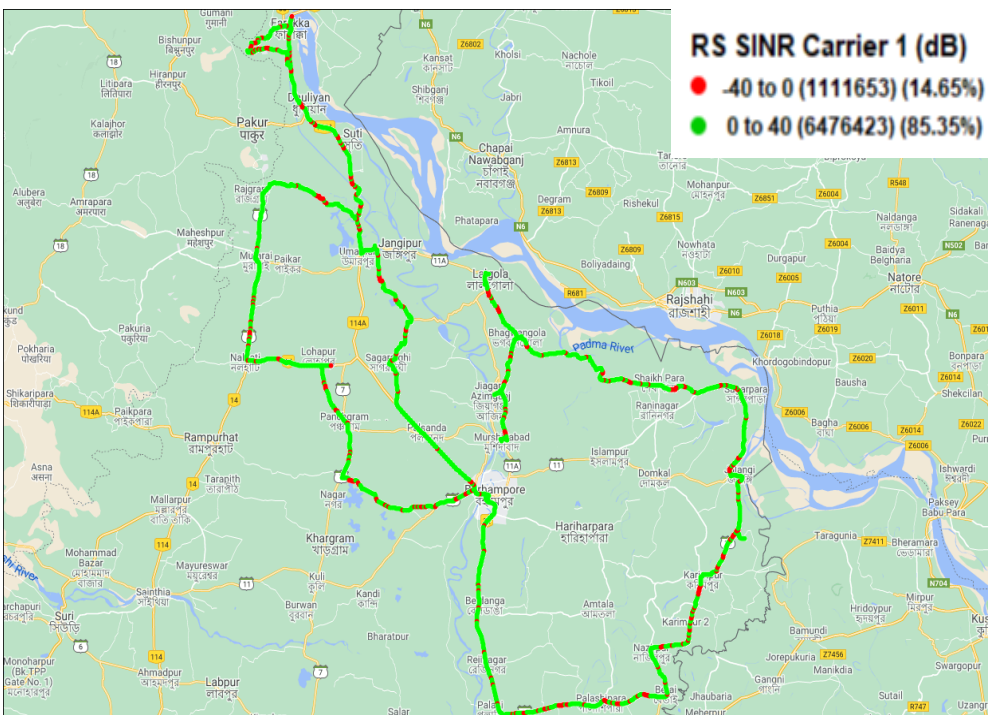
Technology	Rx Quality %
2G	95.66
4G	85.35

2G



Overall Rx Quality	Sample %
(Min <=2)	64.79
(2 <=3)	12.87
(3 <=4)	10.53
(4 <=5)	7.47
(5 <=Max)	4.34
Total	100

4G



Overall SINR	Sample %
(Min <=0)	14.65
(0 <=5)	21.92
(5 <=10)	24.35
(10 <=15)	17.93
(15 <=Max)	21.15
Total	100

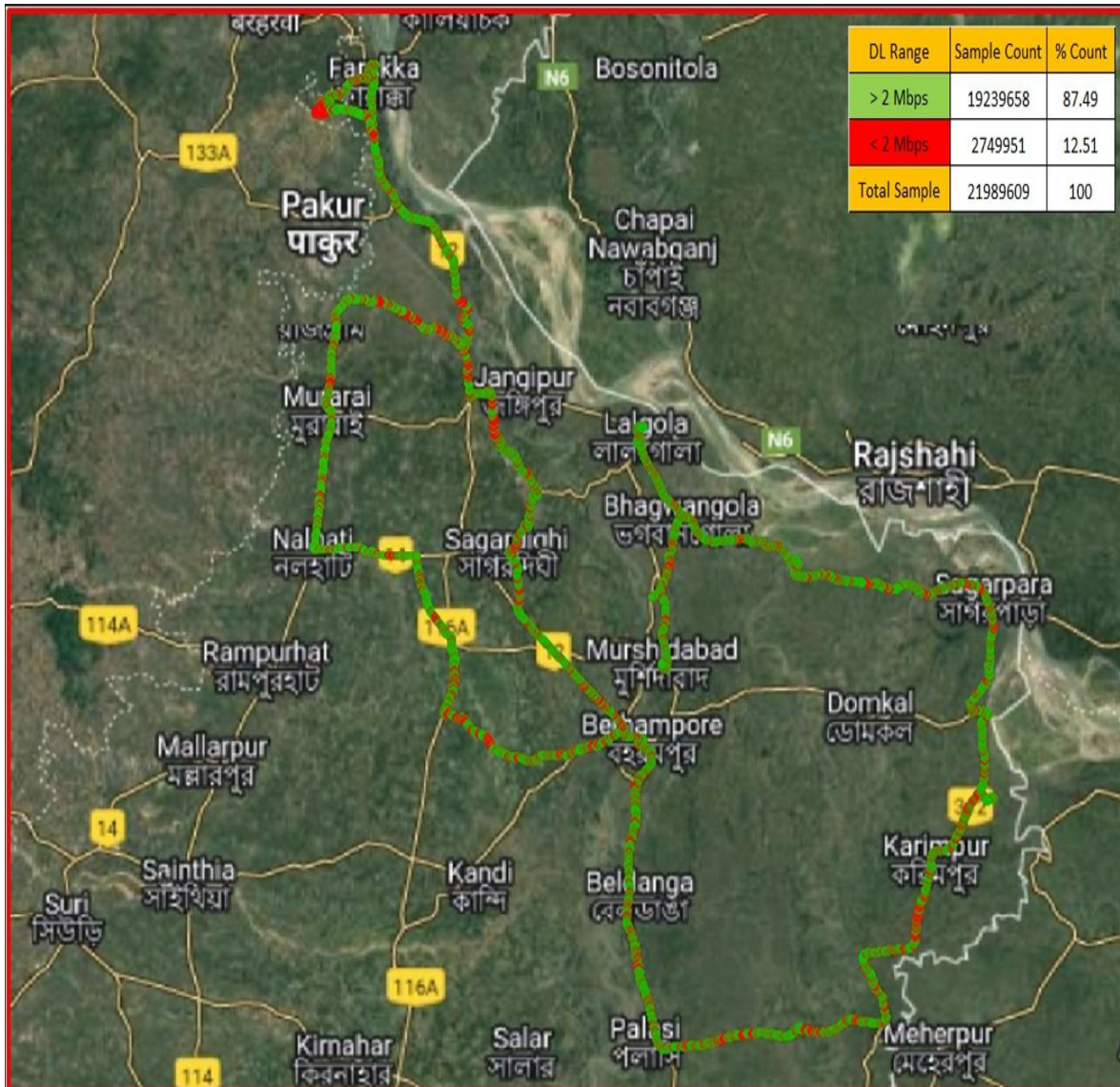
IV. Dynamic Data Test- 4G DL Details

AIRTEL

Dynamic Data Testing Complete 509 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	11.57

4G



AVG. DOWNLOAD SPEED (Mbps)	11.57
% FILE TRANSFER COMPLETE	94.07
DL throughput	Sample %
0 to 1 Mbps	10.46
1 to 2 Mbps	2.03
2 to 5 Mbps	22.68
5 to 10 Mbps	5.75
>10 Mbps	59.05
Total	100

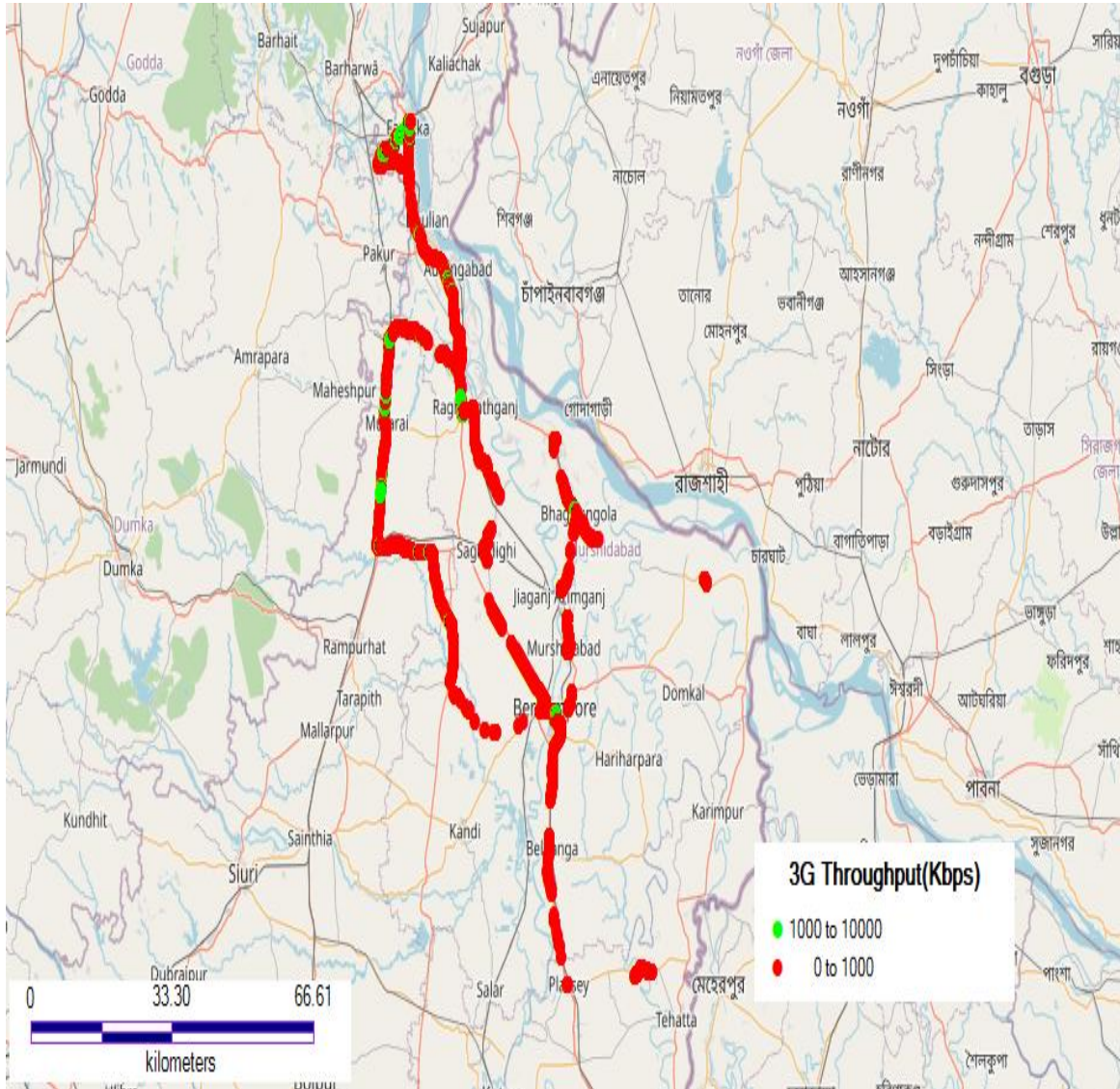
IV. Dynamic Data Test- 3G DL Details

BSNL

Dynamic Data Testing Complete 509 Kms

Data KPIs - Overall	3G
Average Download Throughput (Mbps)	0.67

3G



AVG. DOWNLOAD SPEED (Mbps)	0.67
% FILE TRANSFER COMPLETE	54.92
DL throughput	Sample %
0 to 0.5 Mbps	84
0.5 to 1 Mbps	10
1 to 2 Mbps	5
2 to 5 Mbps	1
>5 Mbps	0
Total	100

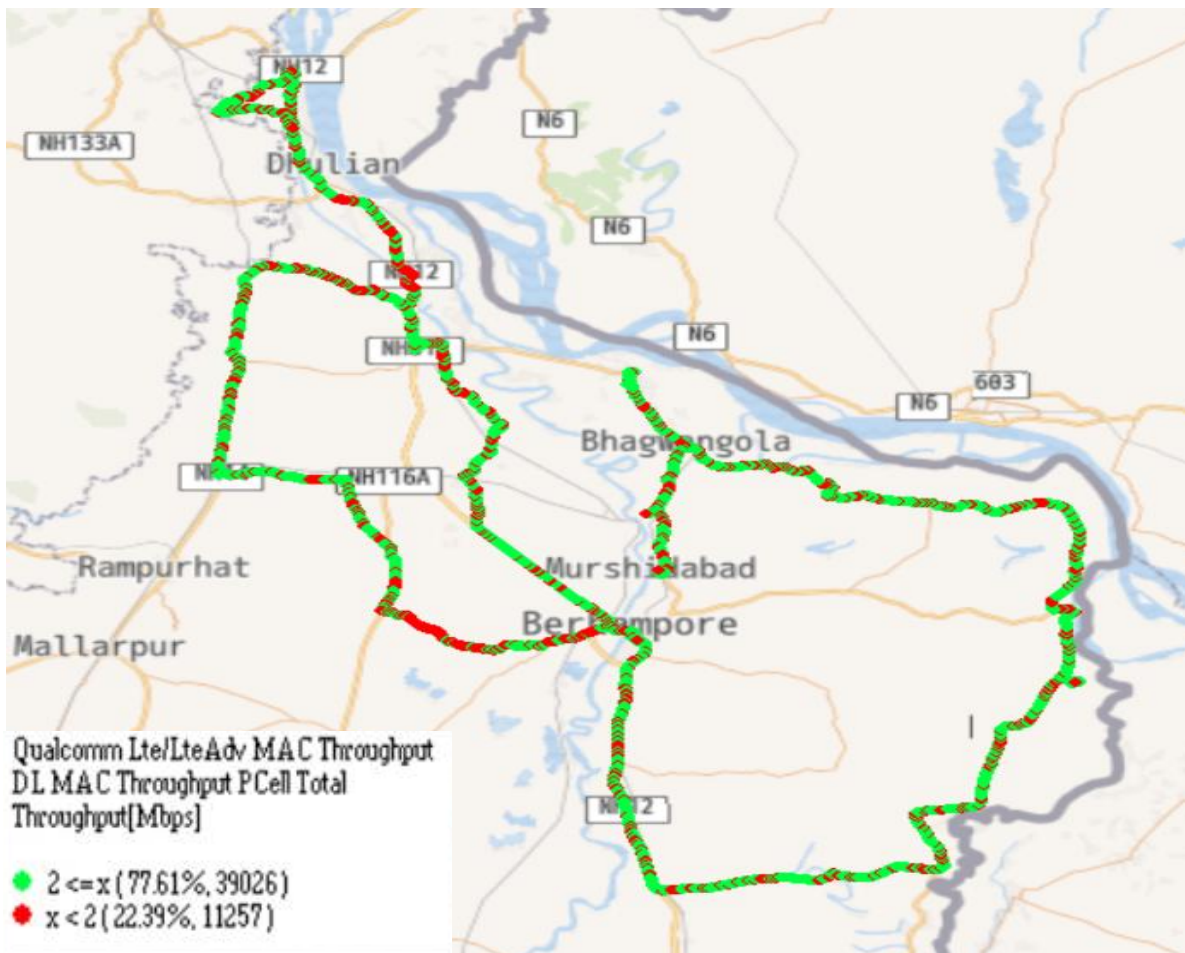
IV. Dynamic Data Test- 4G DL Details

RJIO

Dynamic Data Testing Complete 509 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	8.11

4G



AVG. DOWNLOAD SPEED (Mbps)	8.11
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 1 Mbps	13
1 to 2 Mbps	9
2 to 5 Mbps	23
5 to 10 Mbps	27
>10 Mbps	28
Total	100

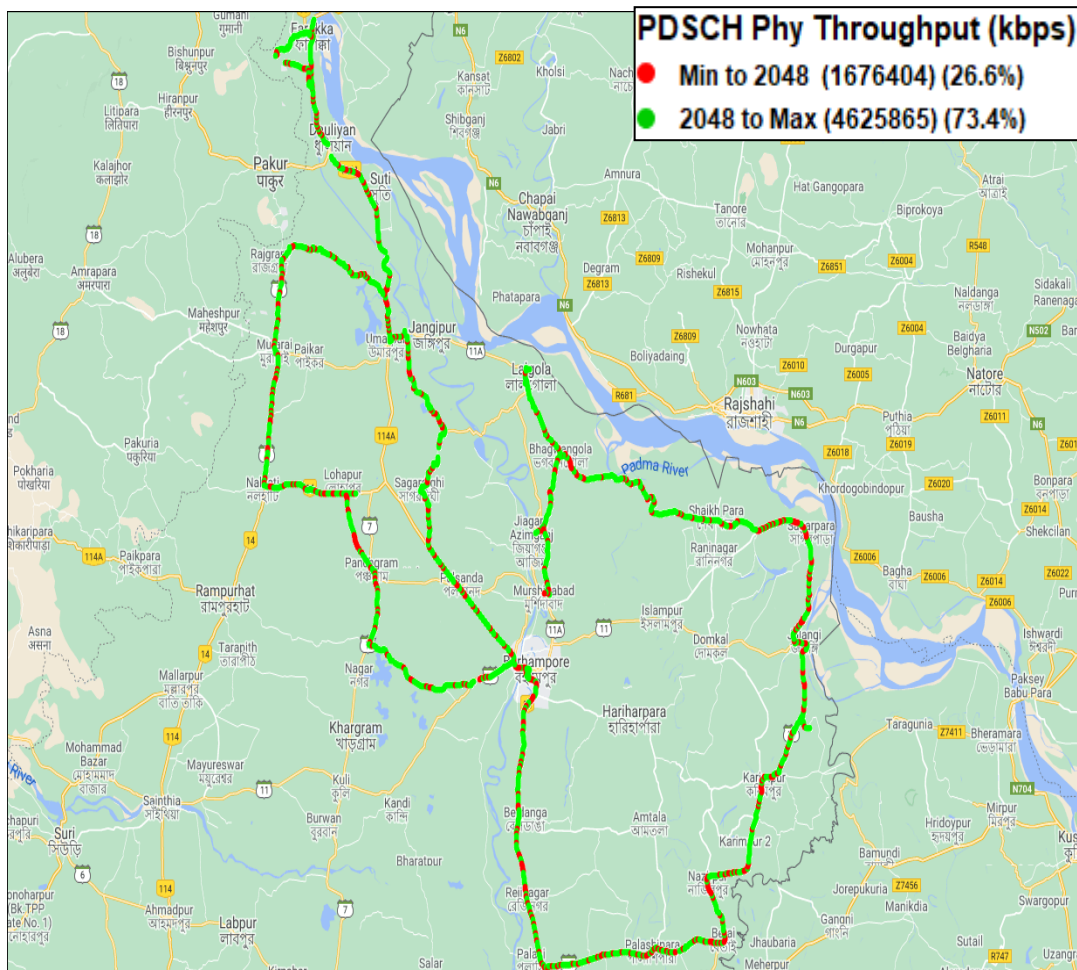
IV. Dynamic Data Test- 4G DL Details

VIL

Dynamic Data Testing Complete 509 Kms

Data KPIs – Overall	4G
Average Download Throughput (Mbps)	20.29

4G



AVG. DOWNLOAD SPEED (Mbps)	20.29
% FILE TRANSFER COMPLETE	99.37
DL throughput	Sample %
0 to 1 Mbps	23.75
1 to 2 Mbps	2.85
2 to 5 Mbps	30.66
5 to 10 Mbps	21.73
>10 Mbps	21.01
Total	100