

Operator Assisted Drive Test Report Uttar & Dakshin Dinajpur and Malda West Bengal October, 2023 (RO, Kolkata)

Key Performance Indicators (KPIs):

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

AIRTEL- Rx Quality in 2G & 4G (SINR) network.

BSNL-Drop Call Rate in 2G & 3G network, Call Setup Success Rate in 3G network, Handover Success Rate in 2G and 3G network, Rx Quality in 2G network.

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

VIL- 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 Uttar & Dakshin Dinajpur and Malda and surrounding areas including National Highways (27, 12, 31, 131A) on 4th October 2023 and 5th October 2023 from 08.30 AM to 08.30 PM. The drive test covered drive route of 479 KMs (approx) over a period of 2 days. Approximately 597+ 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

Uttar Dinajpur also known as **North Dinajpur**, is a district of the Indian state of West Bengal. Created on 1 April 1992 by the division of the erstwhile West Dinajpur district, it comprises two subdivisions: Raiganj and Islampur.

Dakshin Dinajpur also known as **South Dinajpur**, is a district in the Indian state of West Bengal, India. It was created on 1 April 1992 by the division of the erstwhile West Dinajpur District. The Headquarter (sadar) of the district is at Balurghat. It comprises two subdivisions: Balurghat and Gangarampur.

Malda district is a district in West Bengal, India. It lies 347 km (215 miles) north of Kolkata, the capital of West Bengal. The headquarters of Malda district is in English Bazar, also known as **Malda**, which was once the capital of Bengal.

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.

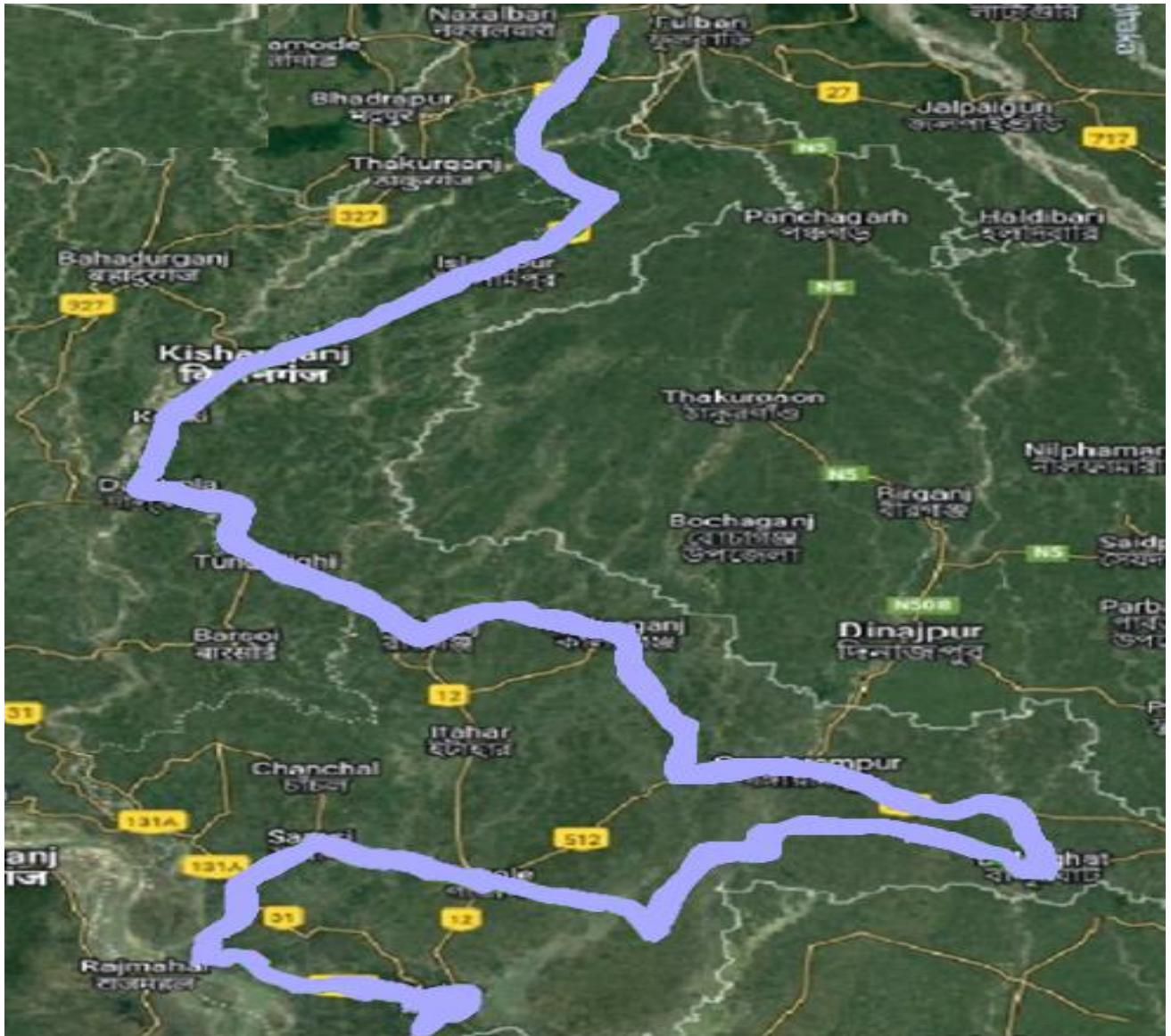
Data Tests: Dynamic Data Service Testing was performed along same route in all technologies. 500 KB file for 2G, 20MB file for 3G and 40MB file for 4G were downloaded from FTTP server in TSP's own server. Static Data Service Testing was also performed. Three 2G (Lock Mode) networks, one 3G (Lock Mode)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

DAY-1—Bagdogra International Airport-Bidhannagar Bus Stand-Chopra Hospital-Ramganj-Dhantola-Kishanganj Kendriya Vidyalaya-Dalkhola-Haripur Bus stop-Botalbari bus stop-Kulik Bird Sanctuary-Hemtabad- Kaliyaganj police station- Atghara-Kushmandi BDO office- Aminpur-Gangarampur-Balurghat Police Station.

DAY-2—Balurghat Police Station-Tapan BDO Office-Daudpur-Kardaha-Nalagola-Maheshpur-Pakuahat Gram Panchayat, Malda-Kamardanga-Bamangola-Karja Danga-Agampur-Banipur-Balarampur-Bamangram-Gazole-Panchpara-Samsi-Baikunthapur-Ratua- Manikchak BDO Office-Milki-Malda Airport-Rathbari-Medical College, Malda-Hanta Kali More-Jodupur Anchal HS-Bandha Pukur-Malda Agri Horticulture Firm-Dishari Institute of Nurshing Science-Webel IT Park-Khaihata-Mangalbari more-Mahananda Bridge-Malda Railway Station-Goyeshpur Junior Basic School-Nabin Cinema Hall, Malda

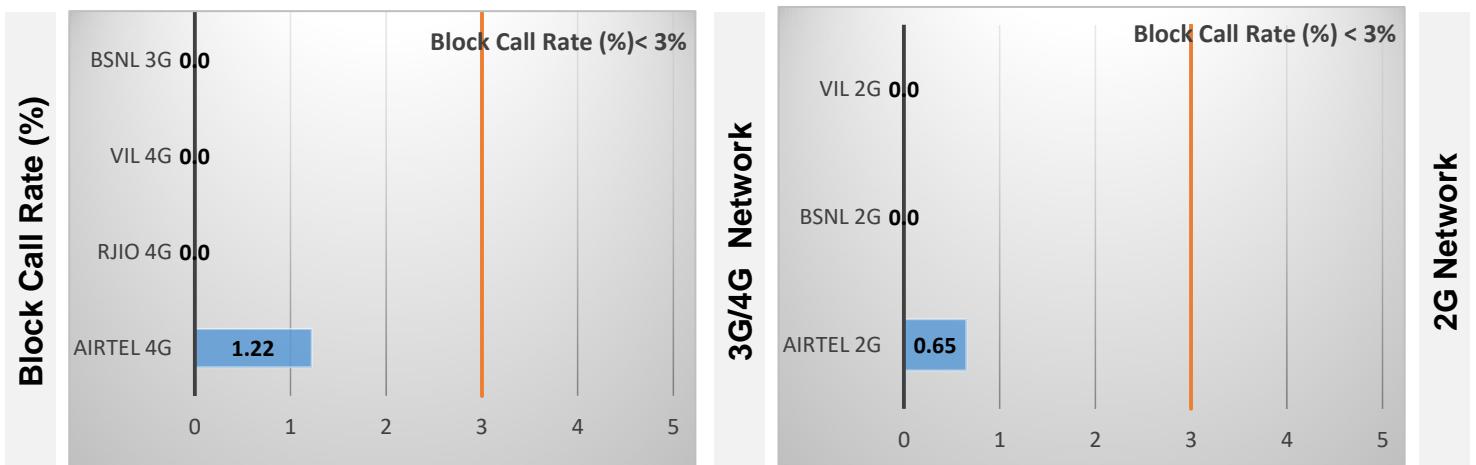
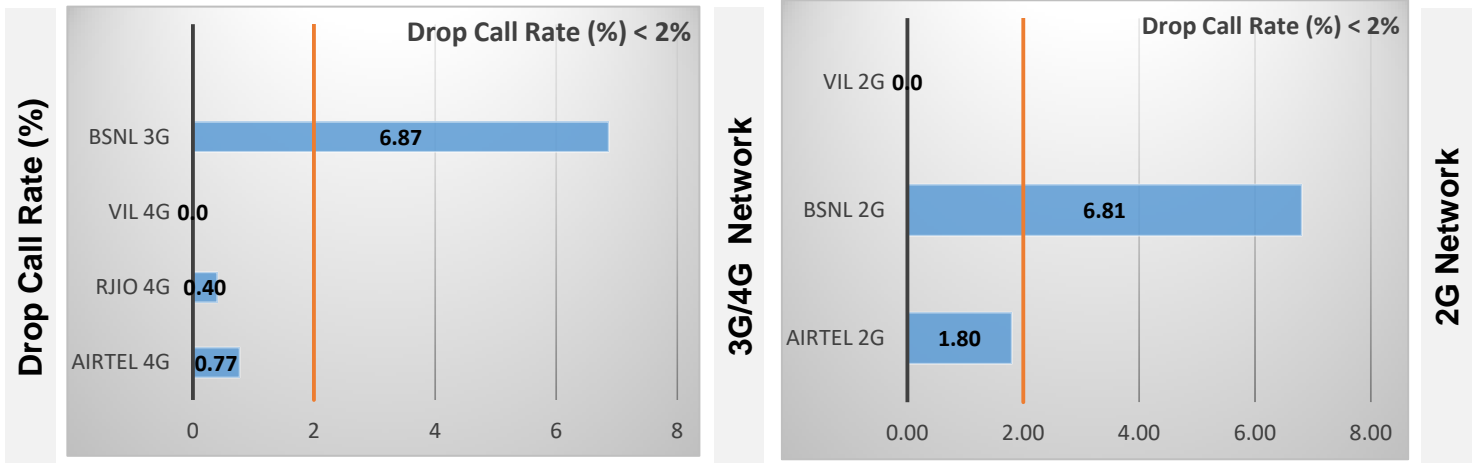
Data Service Test- Static Locations

Static Locations
Bagdogra Airport
Balurghat Police station
Nabin Cinema Hall, Malda

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 %	1.80	6.81	0.0	6.87	0.77	0.40	0.0
Block Call Rate %	0.65	0.0	0.0	0.0	1.22	0.0	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%).

Coverage

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

TSPs	2G		
	AIRTEL	BSNL	VIL
Coverage %	91.74	67.46	84.48

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

TSPs	3G	4G		
	BSNL	AIRTEL	RJIO	VIL
Coverage	26.0	95.07	96.34	94.04

Summary

City Level Summary- Voice

Voice Call	2G		
	AIRTEL	BSNL	VIL
Call Attempt	615	617	645
Blocked Call Rate (%)	0.65	0.0	0.0
CSSR% (Accessibility)	99.35	95.13	99.84
Drop Call Rate (%)	1.80	6.81	0.0
Mobility HOSR (%)	99.47	90.75	98.76
Rx Quality (%)	94.0	92.45	96.72

Voice Call	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Call Attempt	643	657	492	618
Blocked Call Rate (%)	0.0	1.22	0.0	0.0
CSSR% (Accessibility)	90.51	98.78	99.0	99.84
Drop Call Rate (%)	6.87	0.77	0.40	0.0
Mobility HOSR (%)	91.13	100	98.0	98.20
Rx Quality (%)	95.0	85.0	86.62	84.60

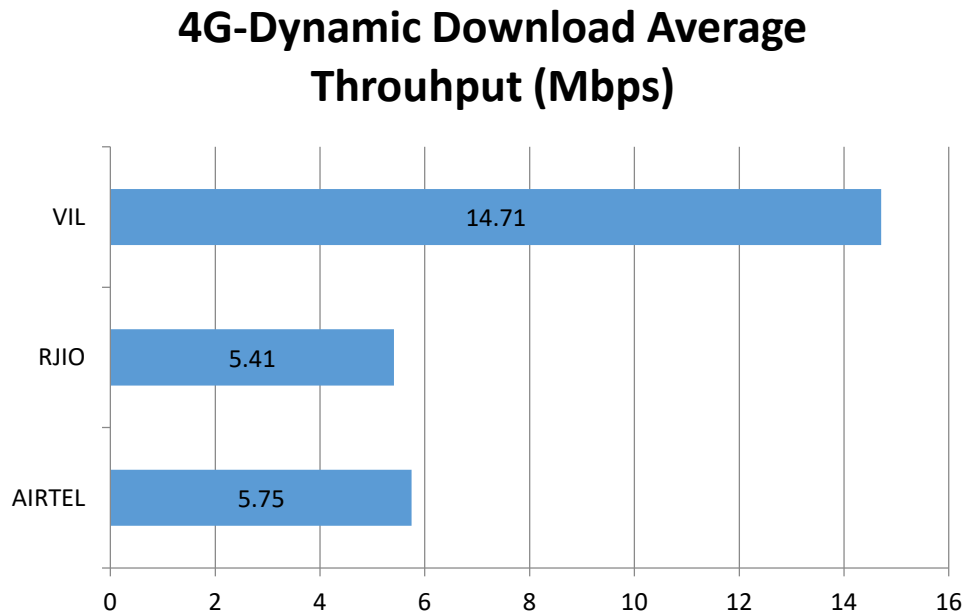
Summary-Data Services Dynamic

Key Observations

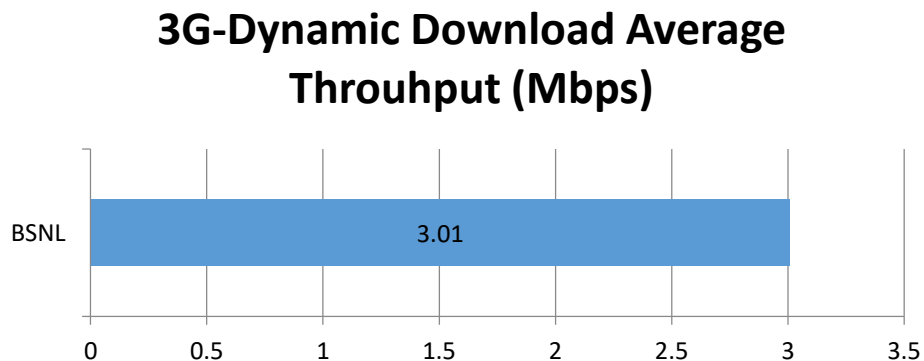
Dynamic Data was tested for 479 Kms. Download Throughput was tested.

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

4G Network:



3G Network:



Summary-Data Services Static

City Level Summary-

Average Data Services Static	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	240.66	631.36	78.77
Upload Throughput (kbps)	18.29	34.69	45.93
Web Browsing Delay (sec)	2.36	57.95	39.95
Latency (msec)	176.66	23.41	205.67

Average Data Services Static	3G/ 4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	3.19	24.51	10.79	8.63
Upload Throughput in Mbps	1.44	6.10	4.95	18.81
Video streaming delay (secs)	1.40	0.53	2.20	1.84
Web Browsing Delay (secs)	9.30	0.32	1.92	4.06
Latency (msec)	1.86	35.9	25.66	102

Summary-Data Services Static

Location Level Summary-

Location:-Bagdogra Airport	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	239.0	243.07	78.94
Upload Throughput (kbps)	26.30	21.0	49.87
Web Browsing Delay (sec)	1.90	64.86	37.69
Latency (msec)	167	67.83	201

Location:-Bagdogra Airport	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	4.09	17.65	10.21	11.85
Upload Throughput in Mbps	1.64	4.58	3.09	14.99
Video streaming delay (secs)	1.02	0.51	2.38	1.73
Web Browsing Delay (secs)	16.39	0.29	2.0	3.98
Latency (msec)	1.63	37.1	27	92.73

Location:- Balurghat Police Station	2G		
	AIRTEL	BSNL	VIL
Download throughput in (kbps)	255.0	619.98	80.32
Upload Throughput in (kbps)	17.30	55.27	44.38
Web Browsing Delay (secs)	2.10	49.22	40.71
Latency (msec)	172	1.23	198

Location:- Balurghat Police Station	4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in (mbps)	2.57	40.95	15.82	8.31
Upload Throughput in (mbps)	1.45	9.02	6.34	16.55
Video streaming delay (secs)	1.60	0.47	2.37	1.82
Web Browsing Delay (secs)	10.43	0.24	1.94	4.32
Latency (msec)	2.96	31.8	25	104.53

Summary-Data Services Static

Location Level Summary-

Location:-Nabin Cinema Hall, Malda	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	228.0	1031.05	77.05
Upload Throughput (kbps)	11.28	27.80	43.54
Web Browsing Delay (sec)	3.10	59.78	41.45
Latency (msec)	191	1.17	218

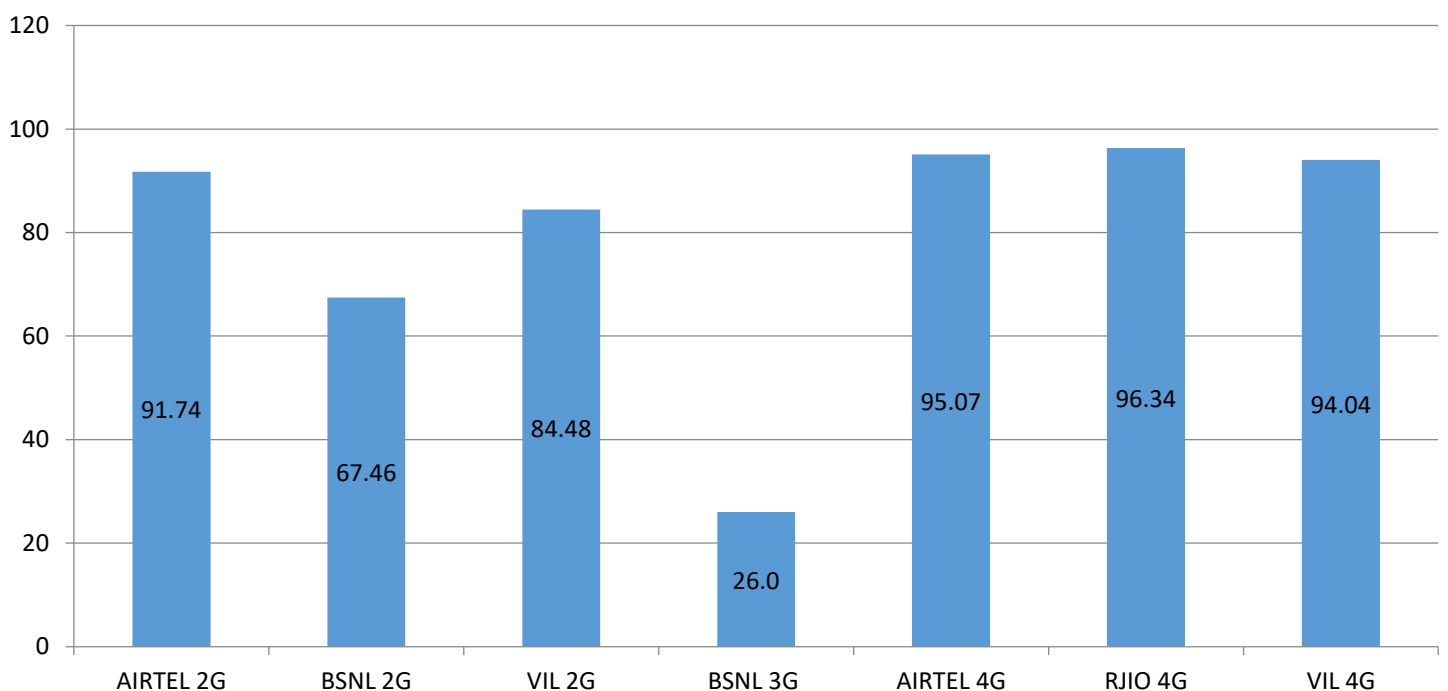
Location:-Nabin Cinema Hall, Malda	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	2.93	14.95	6.35	5.75
Upload Throughput in Mbps	1.24	4.71	5.43	24.88
Video streaming delay (secs)	1.59	0.61	1.85	1.98
Web Browsing Delay (secs)	1.10	0.31	1.83	3.87
Latency (msec)	1.0	39	25	109.78

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	91.74
BSNL 2G	67.46
VIL 2G	84.48
BSNL 3G	26.0
AIRTEL 4G	95.07
RJIO 4G	96.34
VIL 4G	94.04

Coverage Rate %



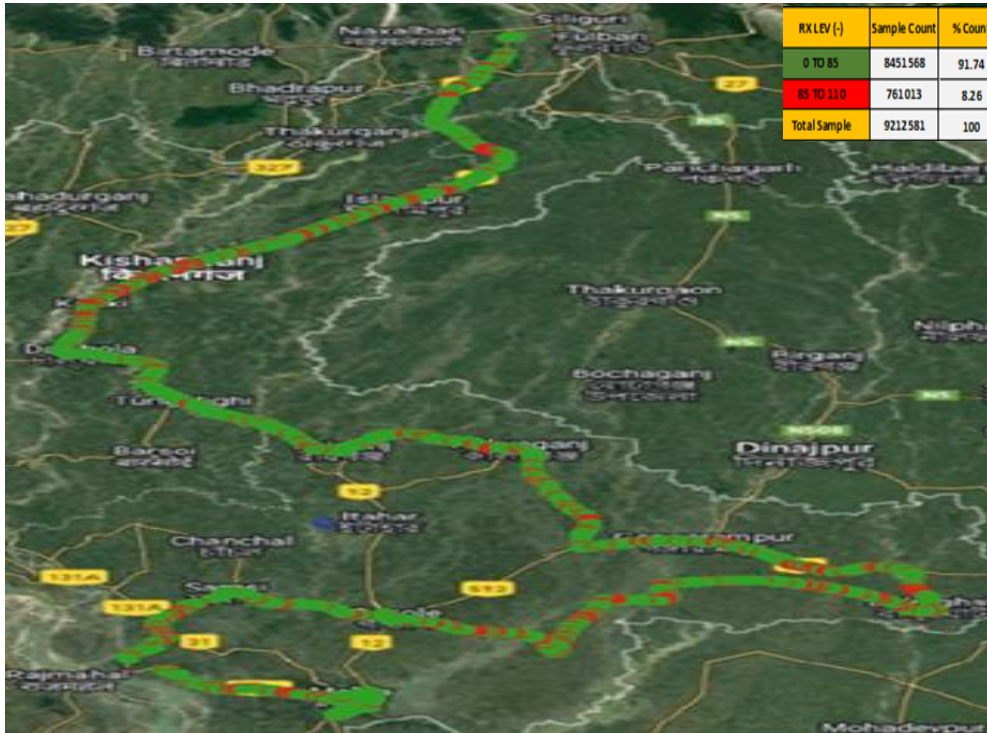
Note- Coverage is the percentage of samples having signal strength more than the threshold value (2G ≥ -85 dbm, 3G ≥ -90 dbm and 4G ≥ -110 dbm). However, these samples are only for the portion of the OADT routes where TSPs have coverage i.e 'no coverage' routes have been excluded.

I. Coverage Details

AIRTEL

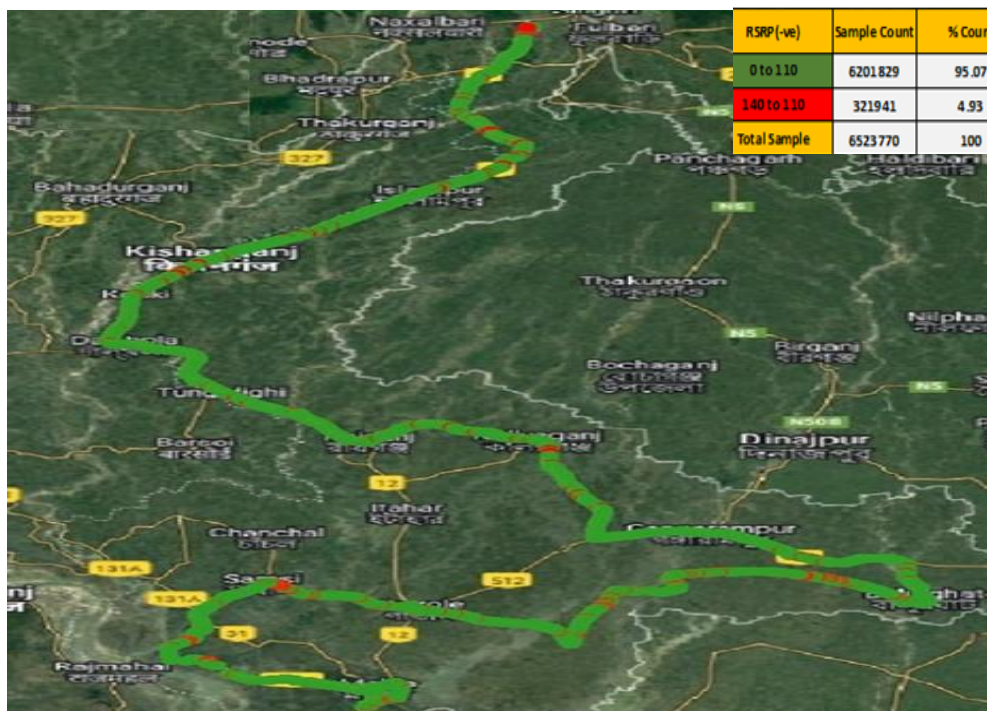
Technology	Coverage Rate %
2G	91.74
4G	95.07

2G



Overall Rx Level	Sample %
[Max >=-75]	23.52
[-75 >=-85)	36.27
[-85 >=-95)	31.95
[-95 >=Min)	8.26
Total	100

4G



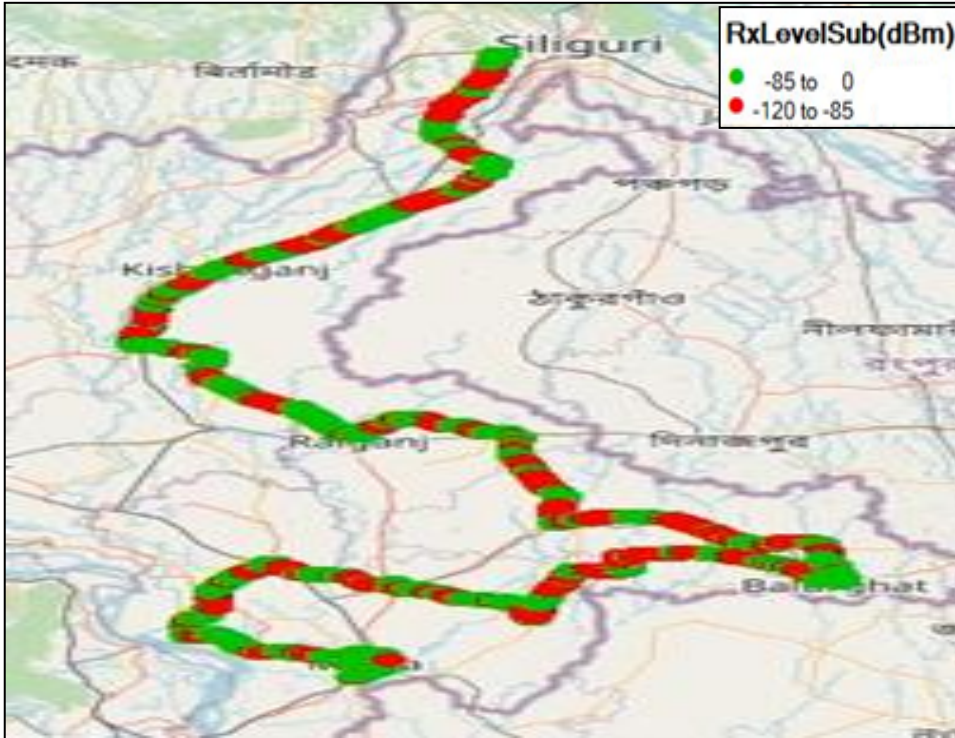
Overall RSRP	Sample %
[Max >=-80]	31.06
[-80 >=-90)	28.23
[-90 >=-110)	35.77
[-110 >=Min)	4.93
Total	100

I. Coverage Details

BSNL

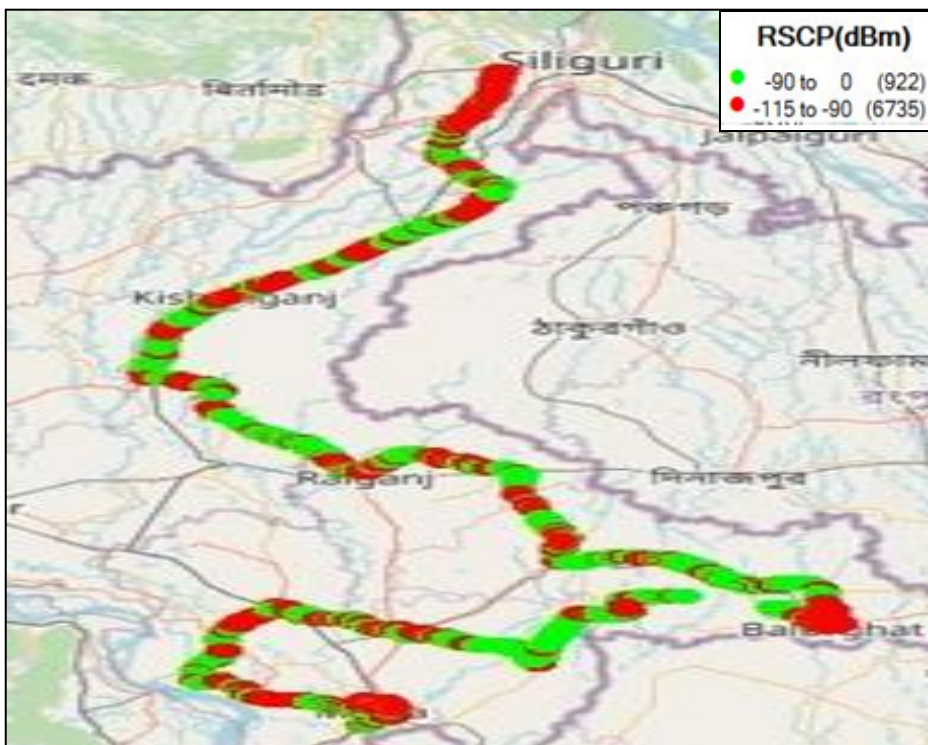
Technology	Coverage Rate %
2G	67.46
3G	26.0

2G



Overall RxLevel	Sample %
[Max >=-75]	38.0
[-75 >=-85]	29.0
[-85 >=-95]	25.0
[-95 >=Min]	8.0
Total	100

3G



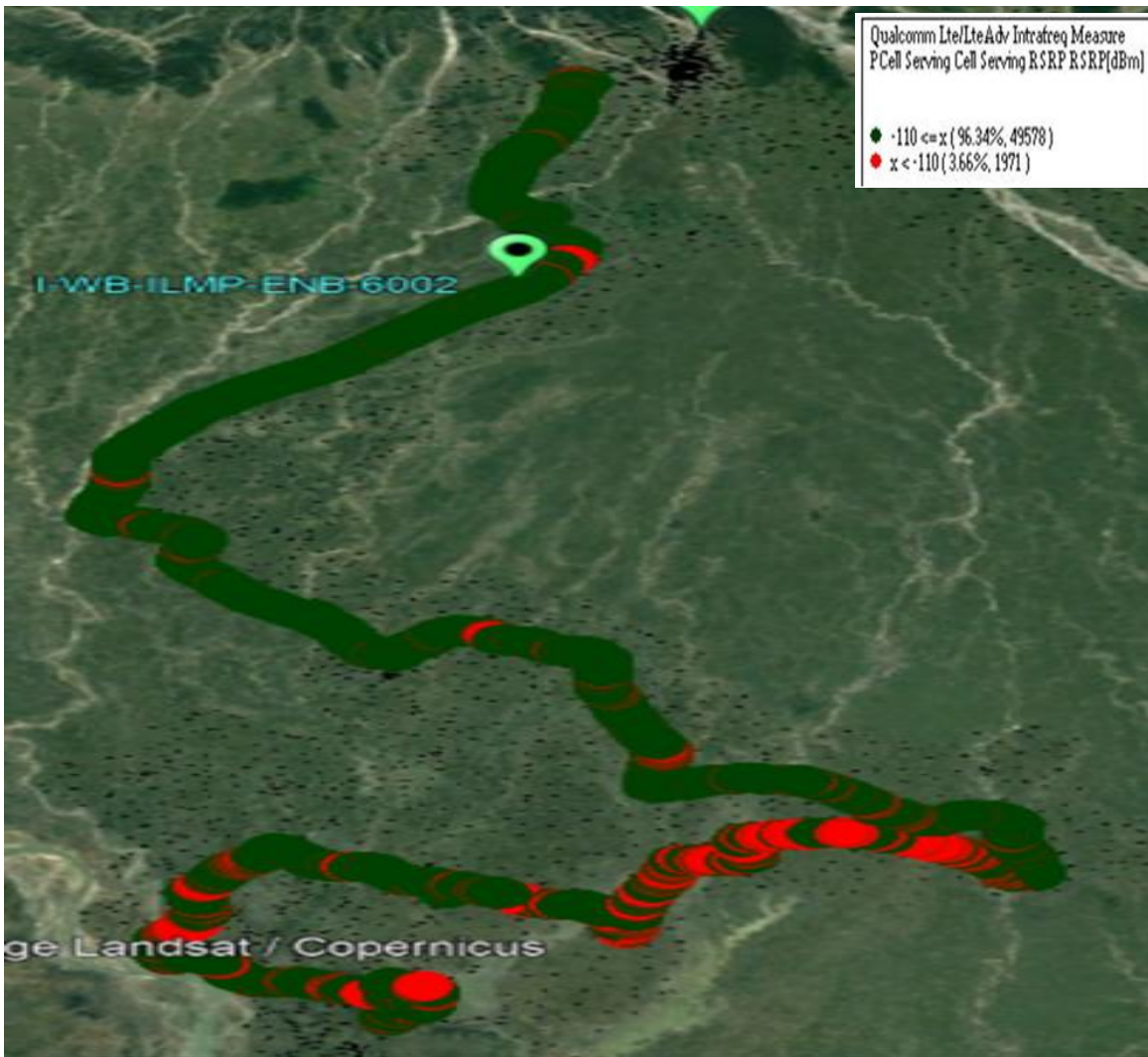
Overall RSCP	Sample %
[Max >=-70]	1.33
[-70 >=-80]	7.45
[-80 >=-90]	16.97
[-90 >=Min]	74.23
Total	100

I. Coverage Details

RJIO

Technology	Coverage Rate %
4G	96.34

4G



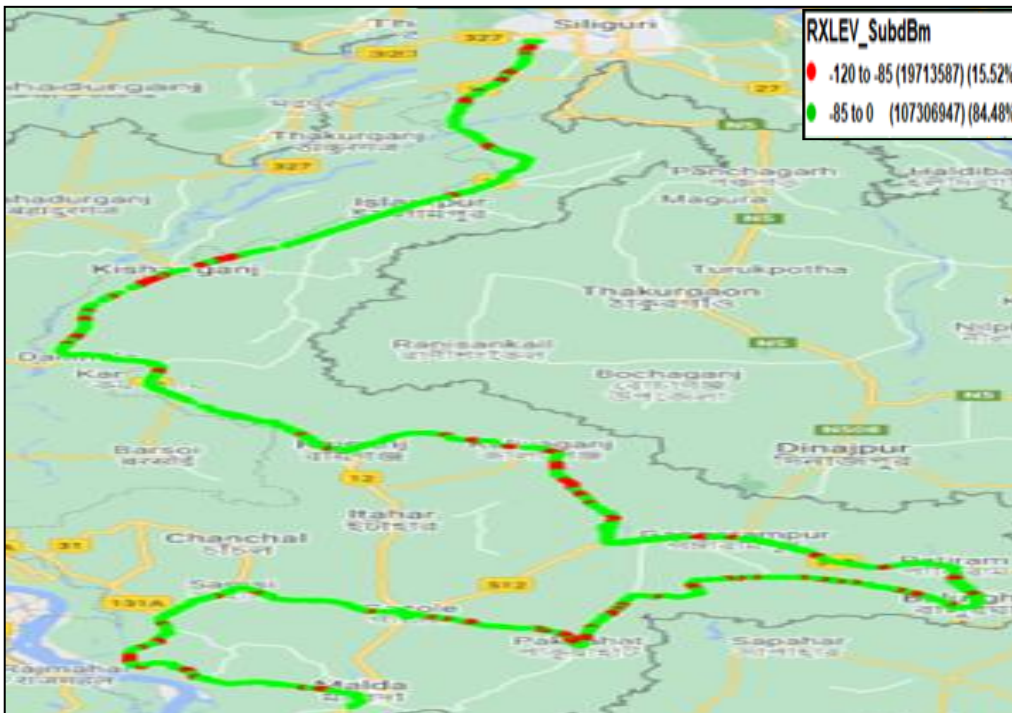
Overall RSRP	Sample %
[Max \geq -80]	25.0
[-80 \geq -90)	25.0
[-90 \geq -110)	46.0
[-110 \geq Min)	4.0
Total	100

I. Coverage Details

VIL

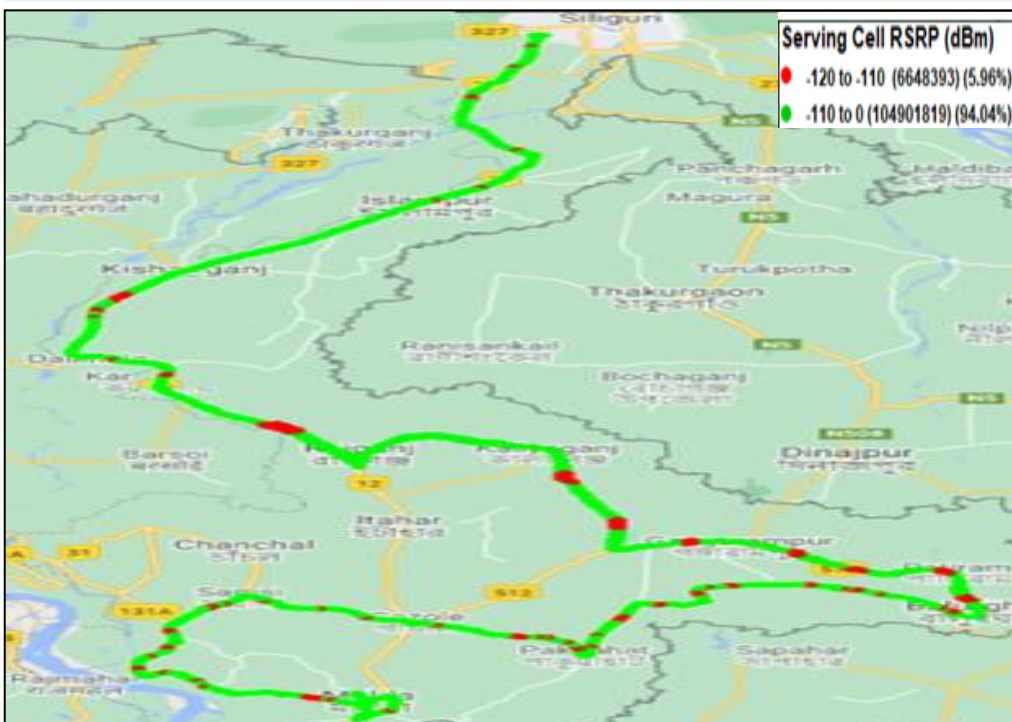
Technology	Coverage Rate %
2G	84.48
4G	94.04

2G



Overall RxLevel	Sample %
[Max >=-75]	54.62
[-75 >=-85)	29.86
[-85 >=-95)	14.37
[-95 >=Min)	1.15
Total	100

4G



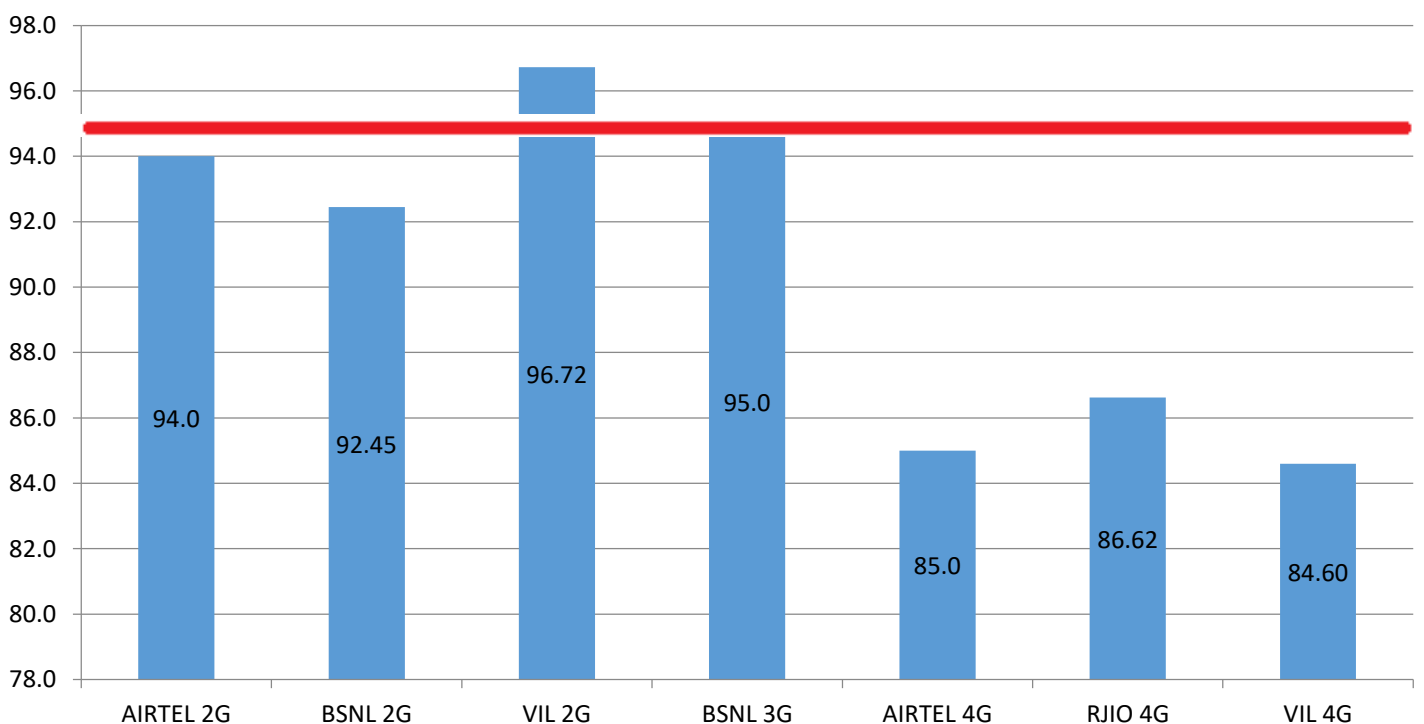
Overall RSRP	Sample %
[Max >=-80]	9.81
[-80 >=-90)	29.84
[-90 >=-110)	54.39
[-110 >=Min)	5.96
Total	100

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	94.0
BSNL 2G	92.45
VIL 2G	96.72
BSNL 3G	95.0
AIRTEL 4G	85.0
RJIO 4G	86.62
VIL 4G	84.60

Rx Quality %

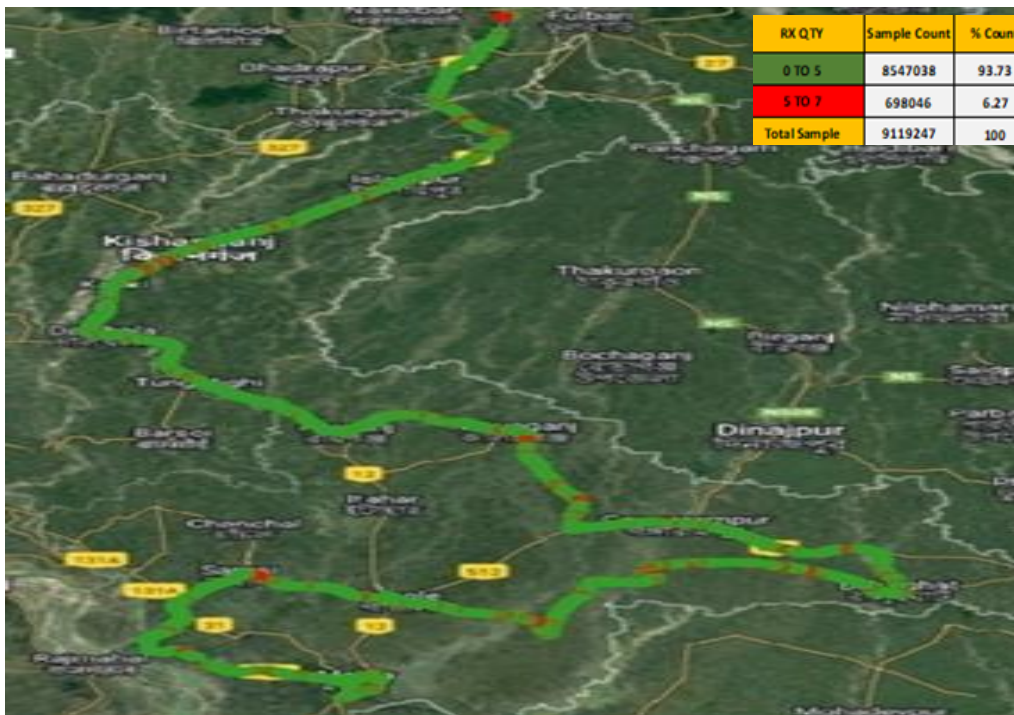


II. Quality Details

AIRTEL

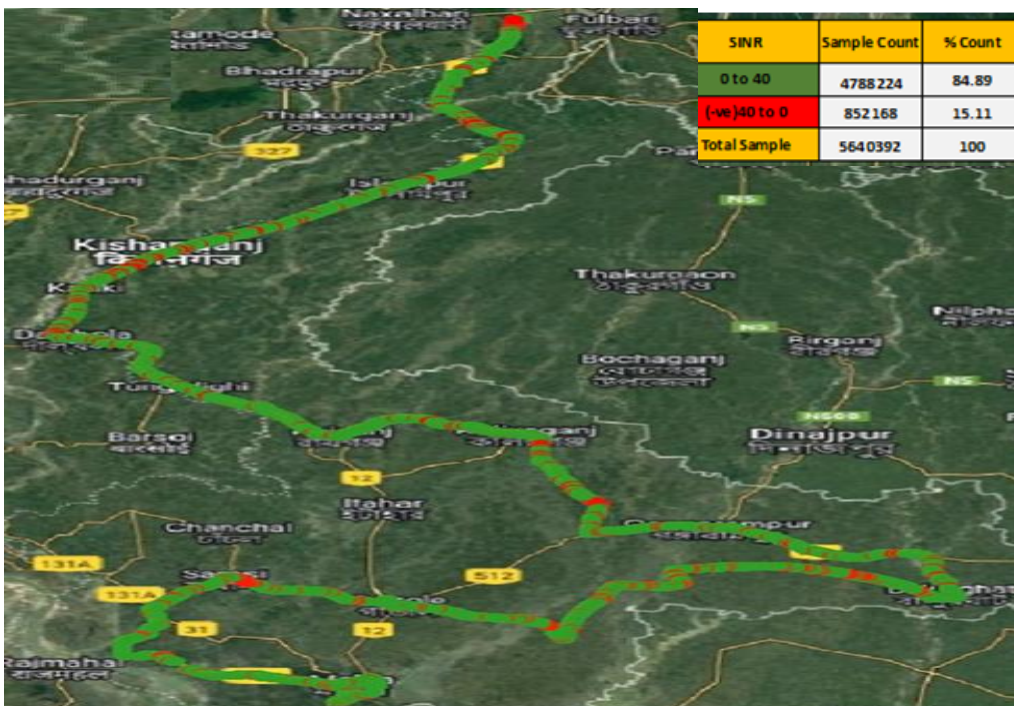
Technology	Rx Quality %
2G	94.0
4G	85.0

2G



Overall Rx Quality	Sample %
(Min <=2)	73.68
(2 <=3)	7.48
(3 <=4)	8.37
(4 <=5)	4.19
(5 <=Max)	6.27
Total	100

4G



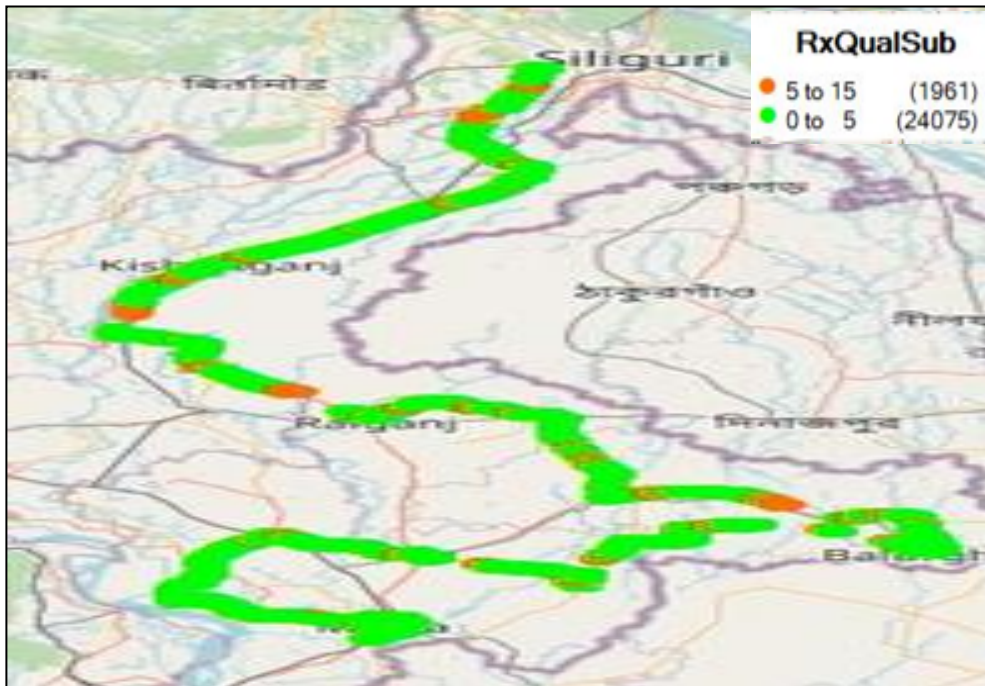
Overall SINR	Sample %
(Min <=0)	15.11
(0 <=5)	23.92
(5 <=10)	26.61
(10 <=15)	27.73
(15 <=Max)	6.63
Total	100

II. Quality Details

BSNL

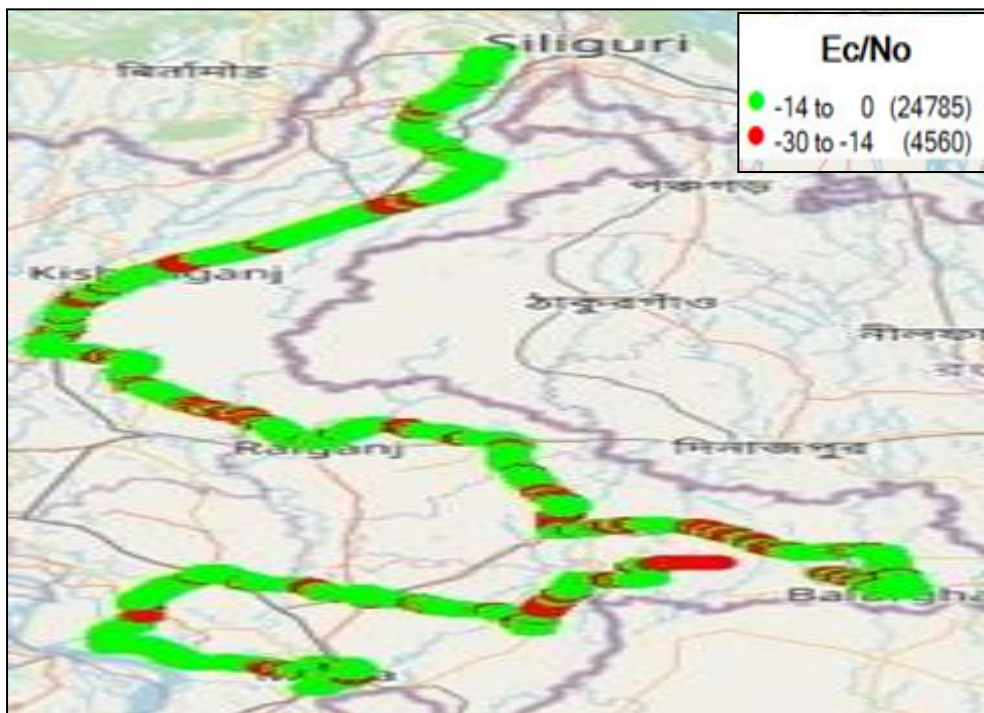
Technology	Rx Quality %
2G	92.45
3G	95.0

2G



Overall Rx Quality	Sample %
(Min <=2)	80.45
(2 <=3)	4.57
(3 <=4)	3.68
(4 <=5)	3.75
(5 <=Max)	7.53
Total	100

3G



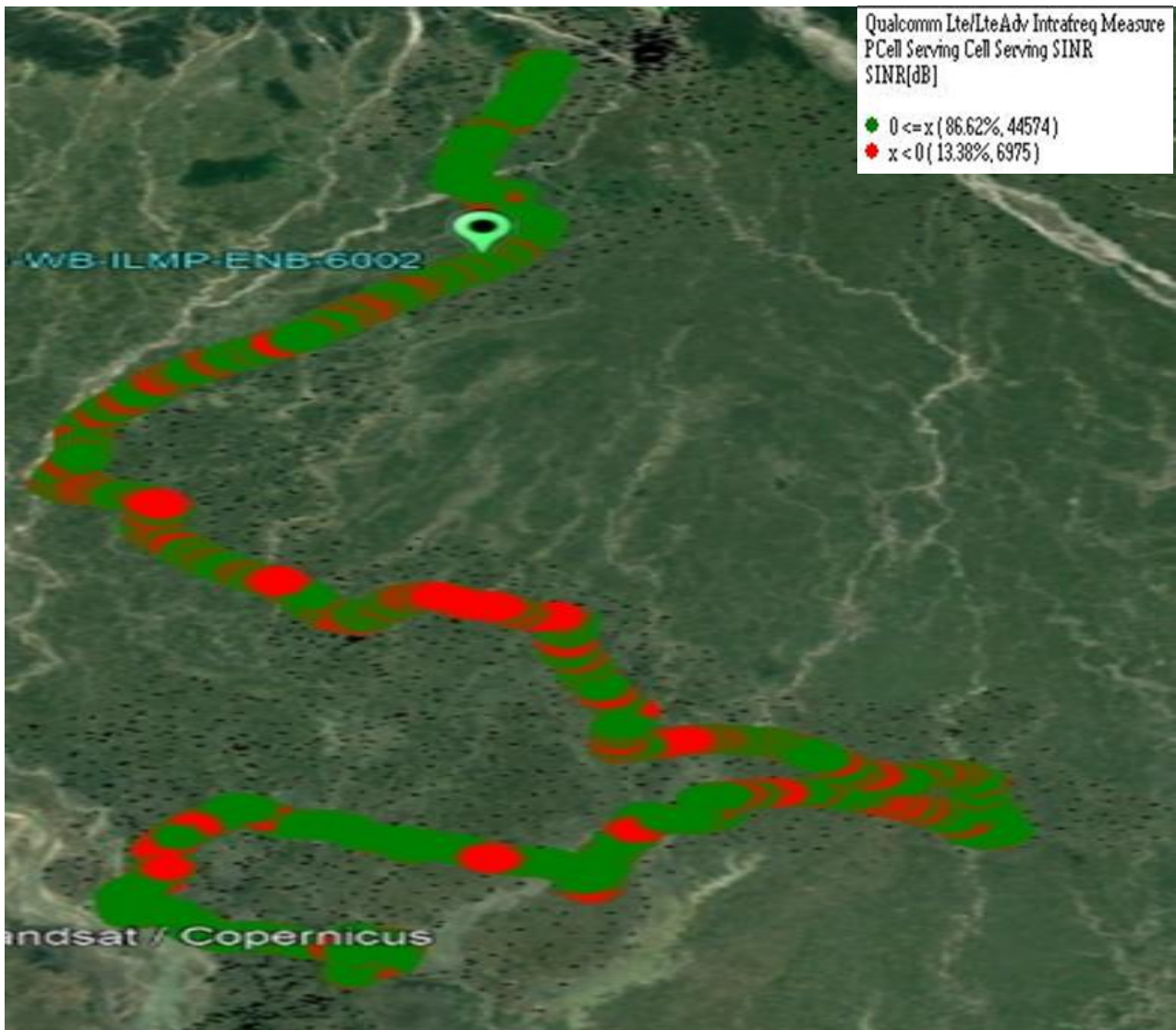
Overall EcNo	Sample %
(Max <=-6)	16.0
(-6 <=-9)	64.0
(-9 <=-11)	14.0
(-11 <=-14)	0.0
(-14 <= Min)	6.0
Total	100

II. Quality Details

RJIO

Technology	Rx Quality %
4G	86.62

4G



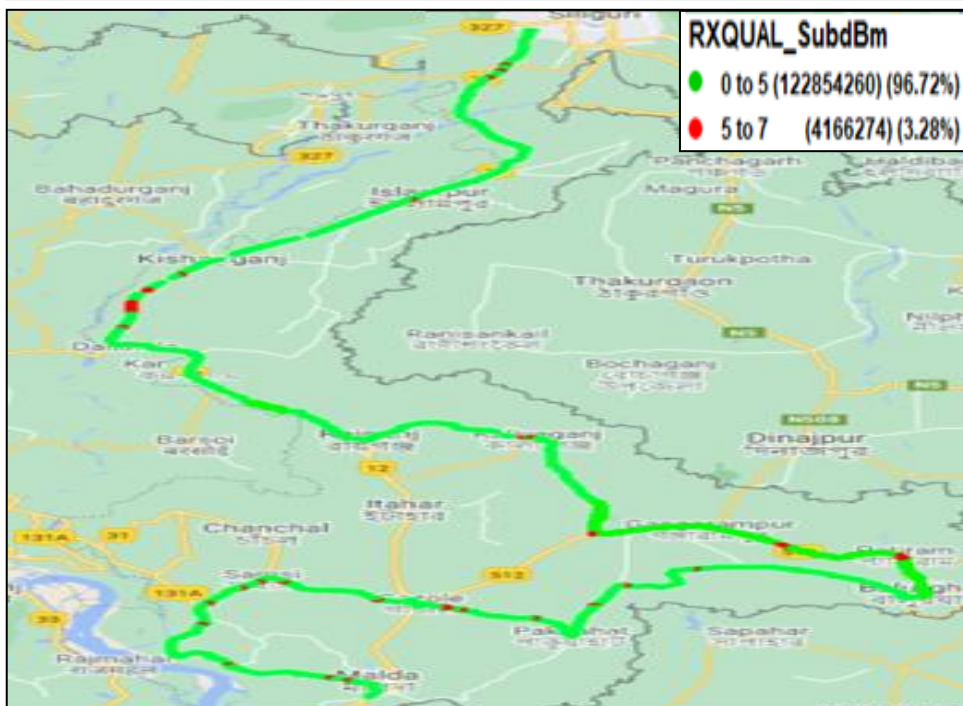
Overall SINR	Sample %
(Min <=0)	14.0
(0 <=5)	23.0
(5 <=10)	25.0
(10 <=15)	21.0
(15 <=Max)	18.0
Total	100

II. Quality Details

VIL

Technology	Rx Quality %
2G	96.72
4G	84.60

2G



Overall Rx Quality	Sample %
(Min <=2)	79.81
(2 <=3)	4.31
(3 <=4)	5.38
(4 <=5)	7.22
(5 <=Max)	3.28
Total	100

4G



Overall SINR	Sample %
(Min <=0)	15.40
(0 <=5)	26.20
(5 <=10)	23.94
(10 <=15)	16.35
(15 <=Max)	18.11
Total	100

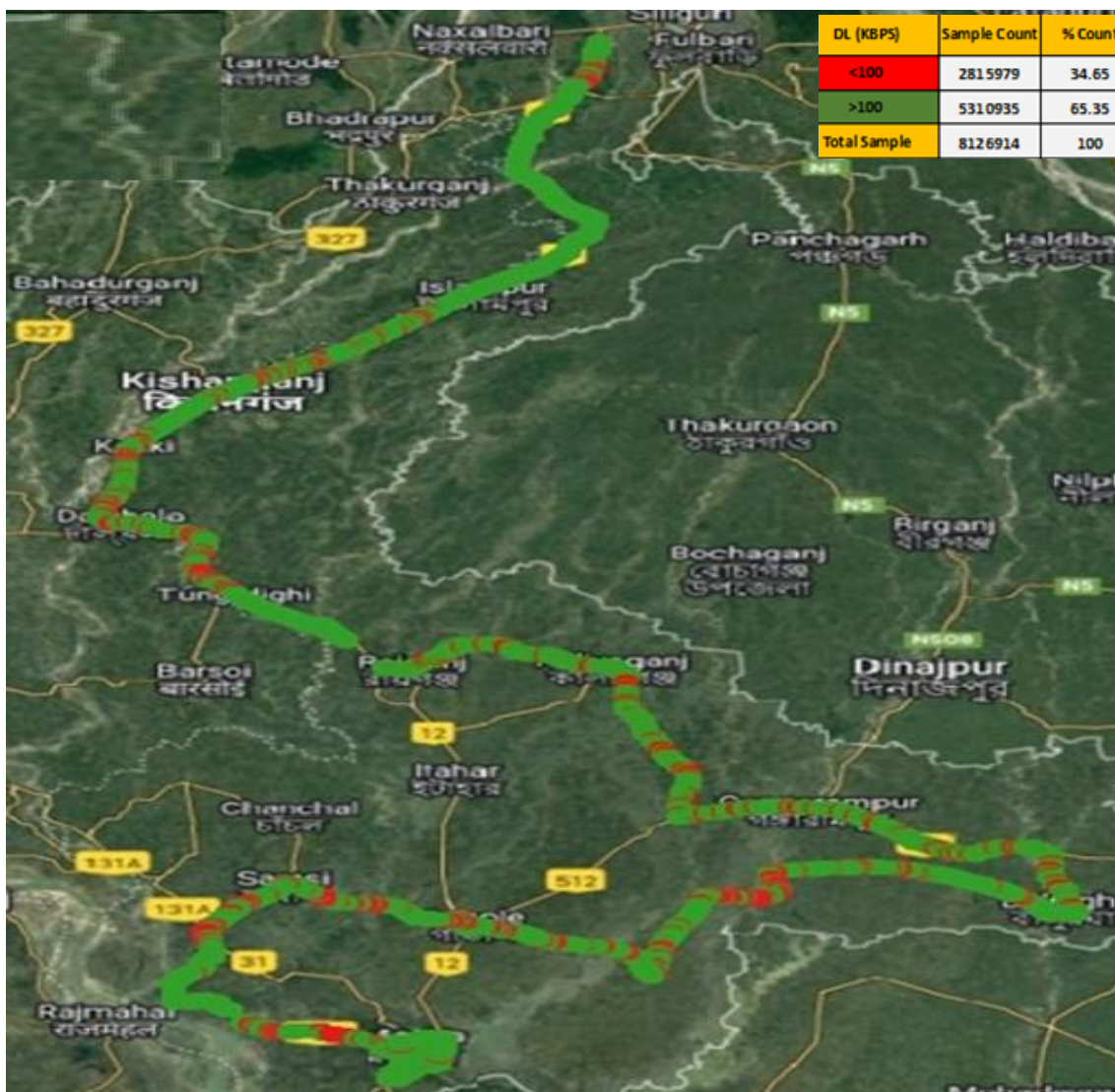
IV. Dynamic Data Test- 2G DL Details

AIRTEL

Dynamic Data Testing Complete 479 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	103.0

2G



AVG. DOWNLOAD SPEED (Kbps)	103.0
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 50 Kbps	7.12
50 to 100 Kbps	27.53
100 to 200 Kbps	33.52
200 to 300 Kbps	31.56
>300 Kbps	0.27
Total	100

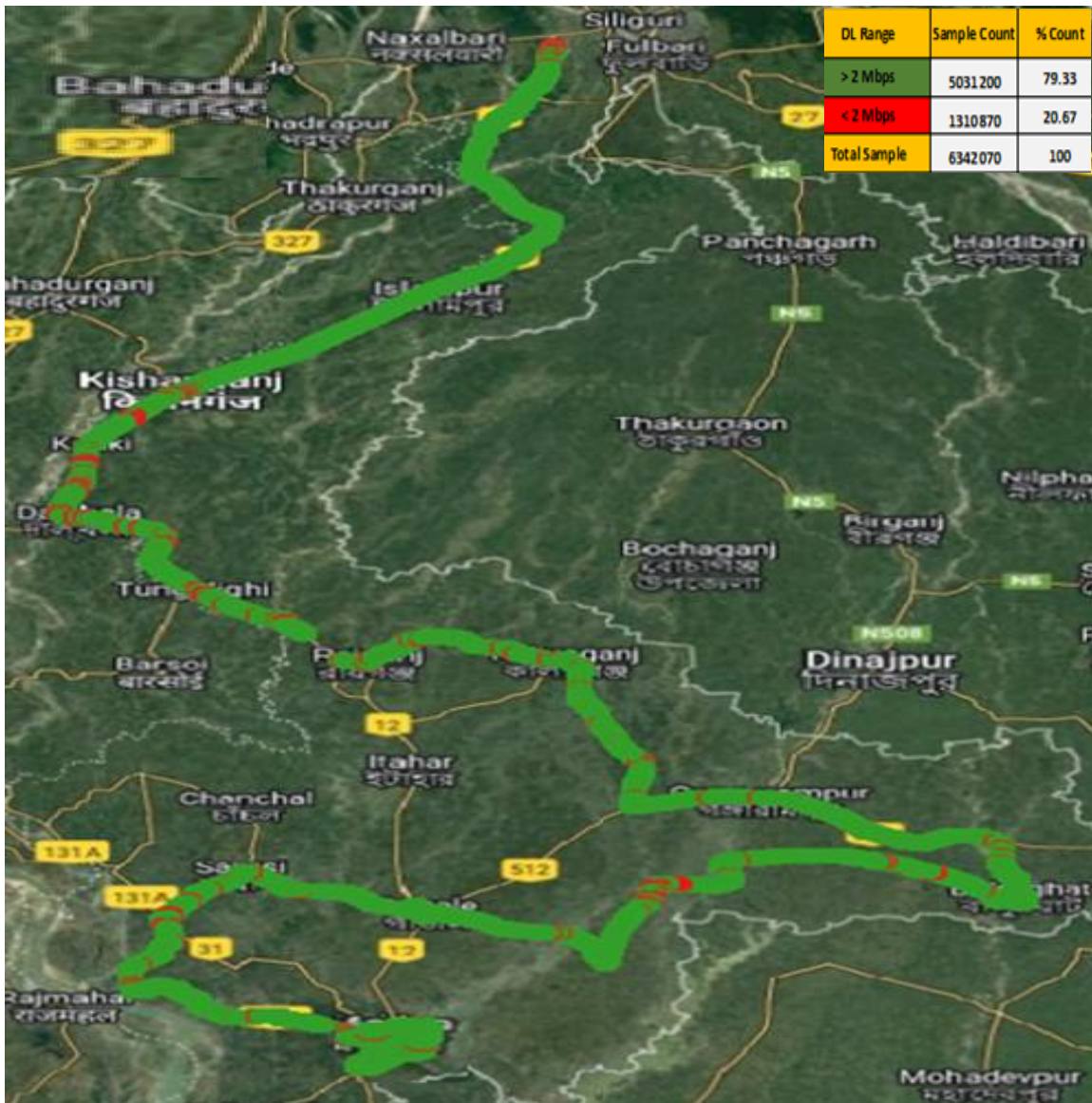
IV. Dynamic Data Test- 4G DL Details

AIRTEL

Dynamic Data Testing Complete 479 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	5.75

4G



AVG. DOWNLOAD SPEED (Mbps)	5.75
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 1 Mbps	9.62
1 to 2 Mbps	11.05
2 to 5 Mbps	36.07
5 to 10 Mbps	24.91
>10 Mbps	18.35
Total	100

IV. Dynamic Data Test- 2G DL Details

BSNL

Dynamic Data Testing Complete 479 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	175.49

2G



AVG. DOWNLOAD SPEED (Kbps)	175.49
% FILE TRANSFER COMPLETE	79.16
DL throughput	Sample %
0 to 50 Kbps	27.41
50 to 100 Kbps	14.14
100 to 200 Kbps	34.06
200 to 300 Kbps	24.37
>300 Kbps	0.02
Total	100

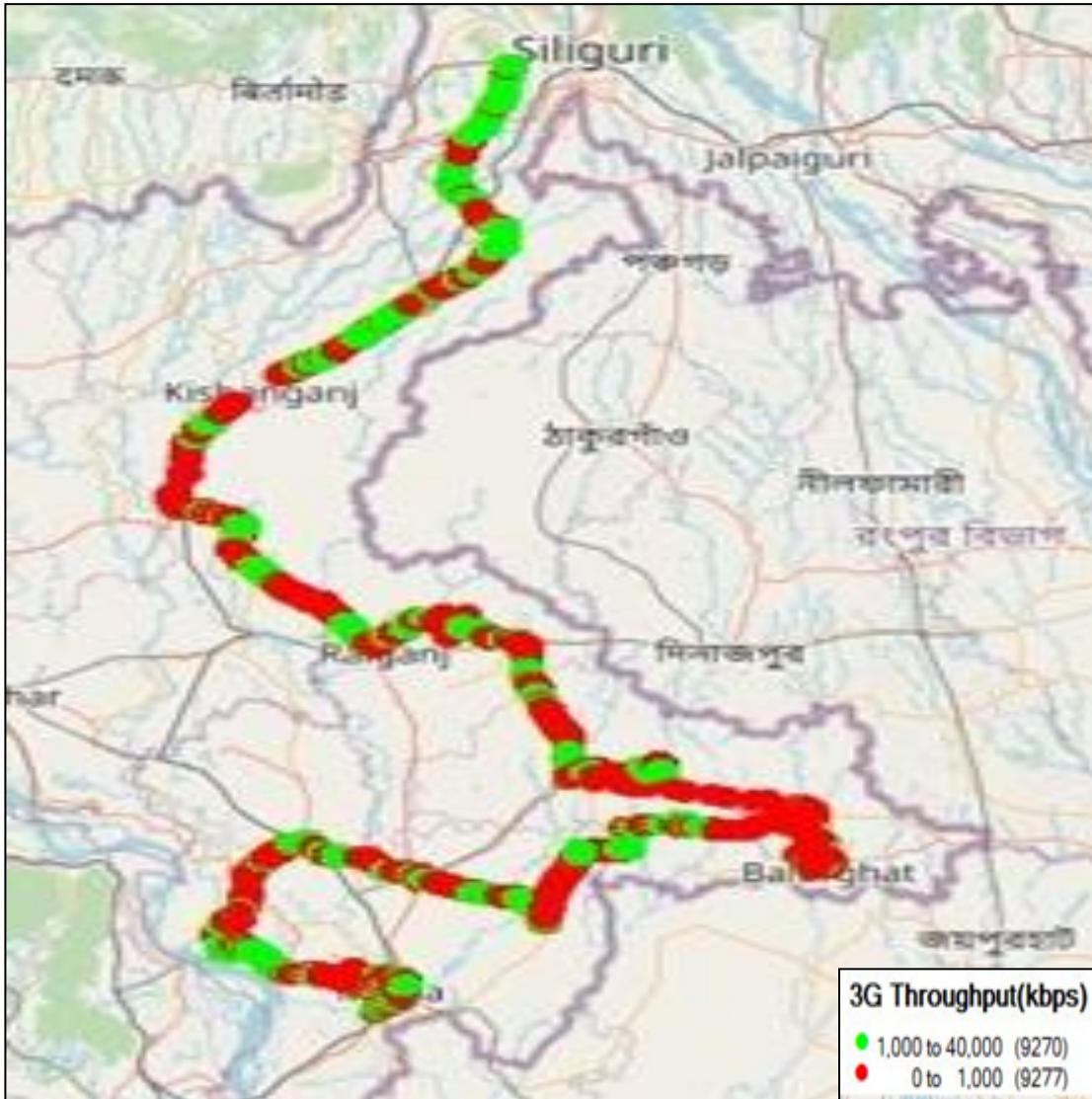
IV. Dynamic Data Test- 3G DL Details

BSNL

Dynamic Data Testing Complete 479 Kms

Data KPIs - Overall	3G
Average Download Throughput (Mbps)	3.01

3G



AVG. DOWNLOAD SPEED (Mbps)	3.01
% FILE TRANSFER COMPLETE	63.32
DL throughput	Sample %
0 to 0.5 Mbps	40.0
0.5 to 1 Mbps	10.0
1 to 2 Mbps	14.0
2 to 5 Mbps	32.0
>5 Mbps	4.0
Total	100

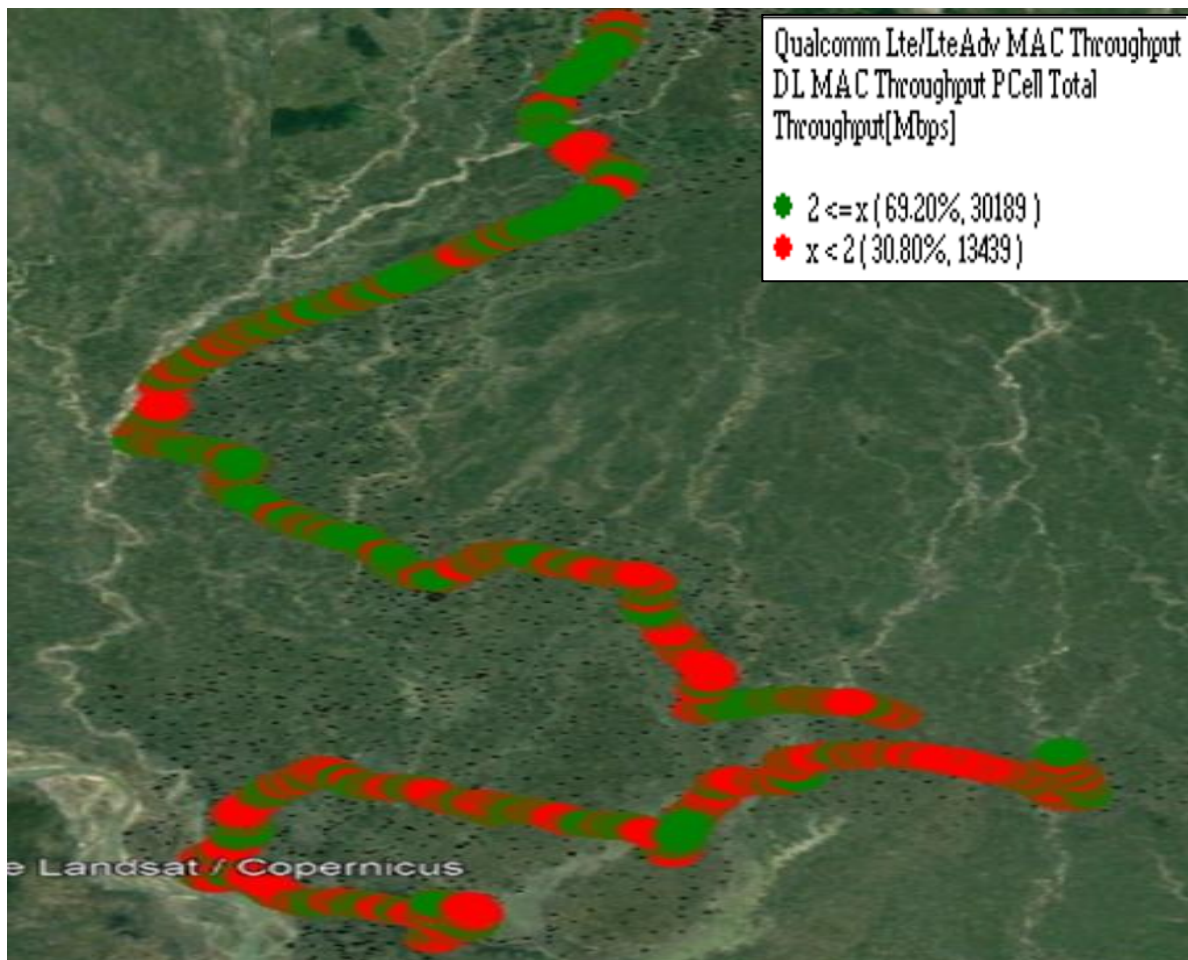
IV. Dynamic Data Test- 4G DL Details

RJIO

Dynamic Data Testing Complete 479 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	5.41

4G



AVG. DOWNLOAD SPEED (Mbps)	5.41
% FILE TRANSFER COMPLETE	99.90
DL throughput	Sample %
0 to 1 Mbps	18.96
1 to 2 Mbps	11.84
2 to 5 Mbps	32.61
5 to 10 Mbps	19.45
>10 Mbps	17.14
Total	100

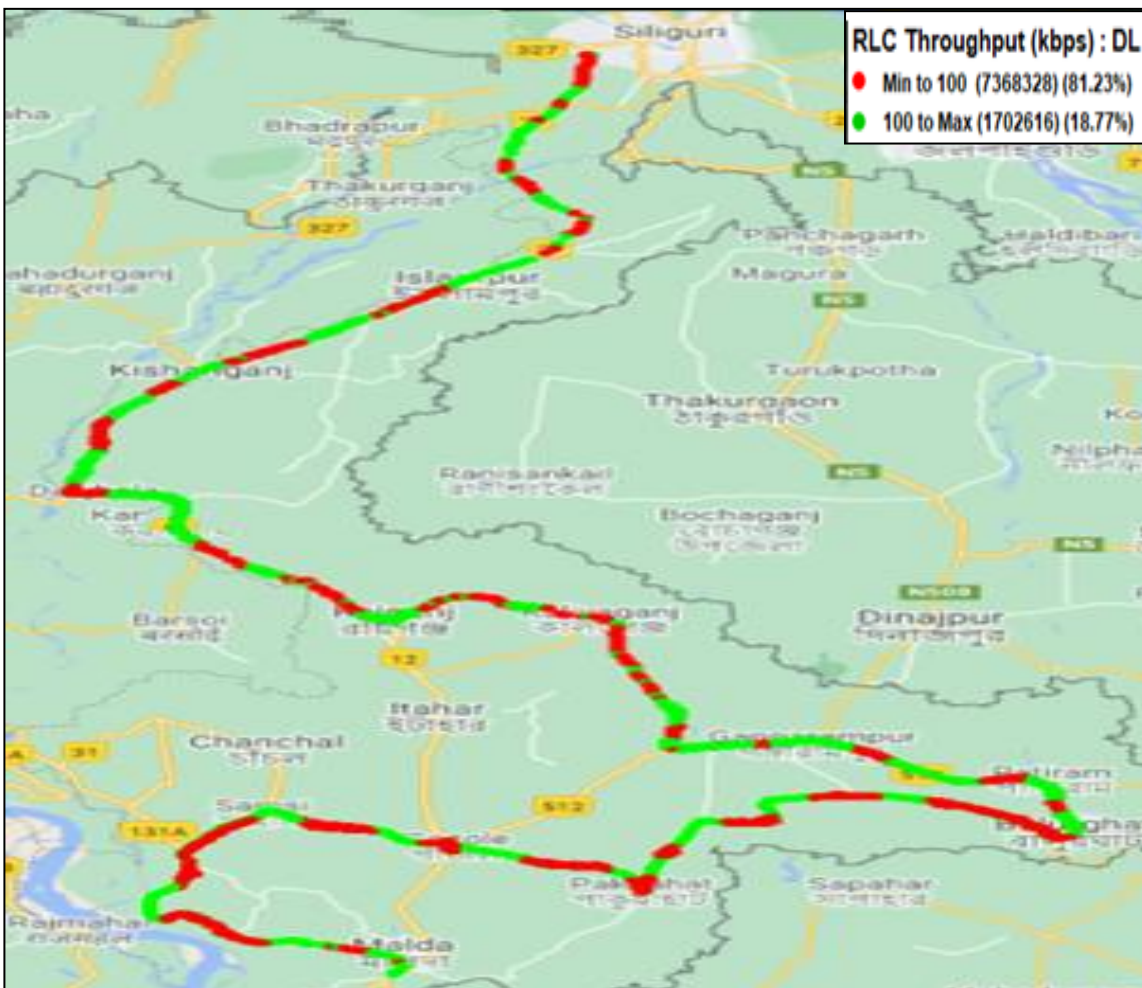
IV. Dynamic Data Test-2G DL Details

VIL

Dynamic Data Testing Complete 479 Kms

Data KPIs – Overall	2G
Average Download Throughput (Kbps)	81.23

2G



AVG. DOWNLOAD SPEED (Kbps)	81.23
% FILE TRANSFER COMPLETE	78.15
DL throughput	Sample %
0 to 50 Kbps	59.15
50 to 100 Kbps	22.08
100 to 200 Kbps	11.12
200 to 300 Kbps	7.59
>300 Kbps	0.06
Total	100

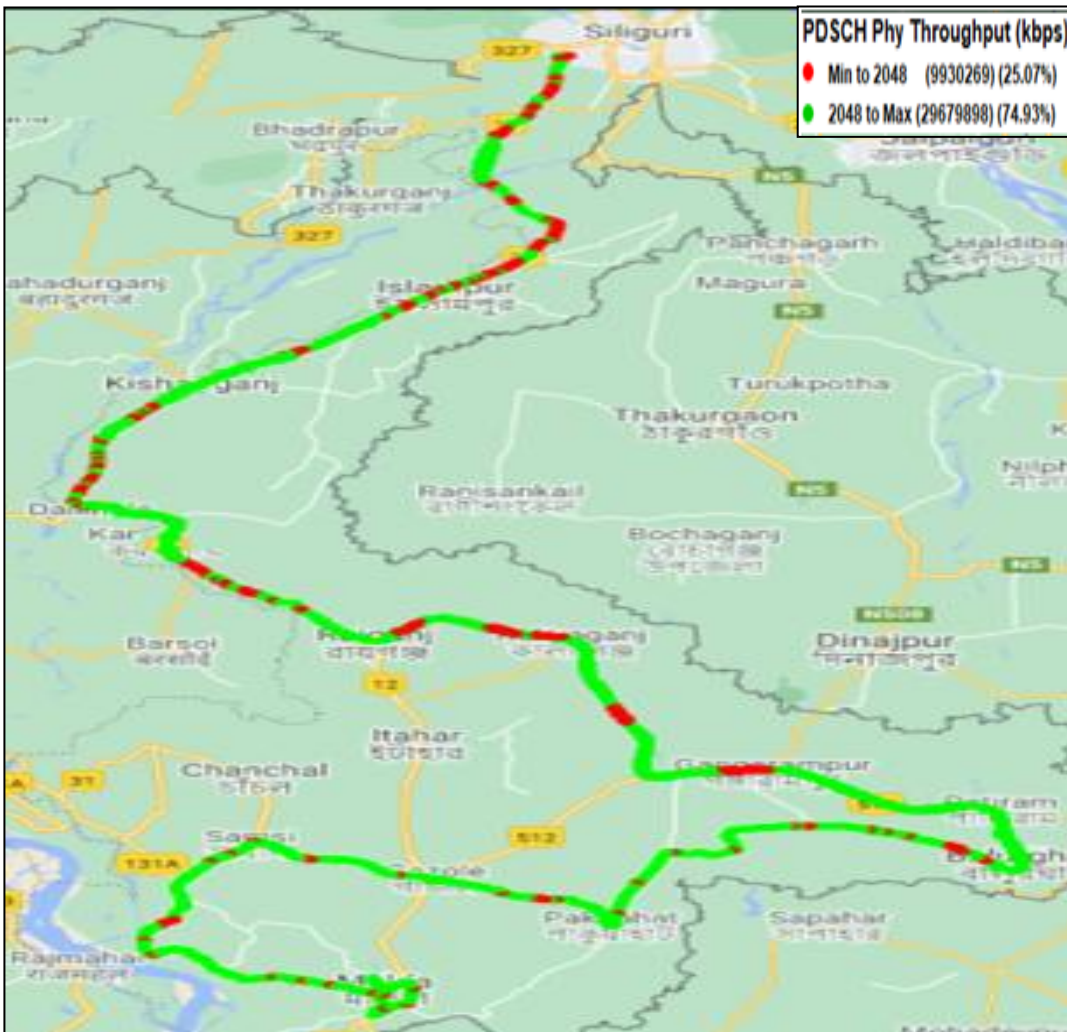
IV. Dynamic Data Test- 4G DL Details

VIL

Dynamic Data Testing Complete 479 Kms

Data KPIs – Overall	4G
Average Download Throughput (Mbps)	14.71

4G



AVG. DOWNLOAD SPEED (Mbps)	14.71
% FILE TRANSFER COMPLETE	98.56
DL throughput	Sample %
0 to 1 Mbps	13.56
1 to 2 Mbps	11.51
2 to 5 Mbps	23.99
5 to 10 Mbps	21.16
>10 Mbps	29.78
Total	100