

Operator Assisted Drive Test Report Kalimpong, Jalpaiguri and Alipurduar August, 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 3G network, Call Set up Success Rate (CSSR%) in 2G & 3G network and Rx Quality in 2G & 3G (Ec/Io) network.

RJIO- Rx Quality (SINR) in 4G 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 Kalimpong, Jalpaiguri, Alipurduar and surrounding areas including National Highways (17, 317, 317A) on 10th August 2023 and 11th August 2023 from 08.30 AM to 08.30 PM. The drive test covered drive route of 330 KMs (approx) over a period of 2 days. Approximately 348+ 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

Kalimpong is a town and the headquarters of an eponymous district in the Indian state of West Bengal. It is located at an average elevation of 1,250 metres (4,101 ft). The town is the headquarters of the Kalimpong district.

Jalpaiguri is a city in the Indian state of West Bengal. It is the headquarters of the Jalpaiguri district. The city is located on the banks of the Teesta River which is the second largest river in West Bengal after the Ganges, on the foothills of the Himalayas.

Alipurduar is a city and a municipality in the Indian state of West Bengal. It is the headquarters of the Alipurduar district. Situated on the east bank of Kaljani River on the foothills of the Himalayas, the city is a gateway to Bhutan and northeastern states of India.

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.

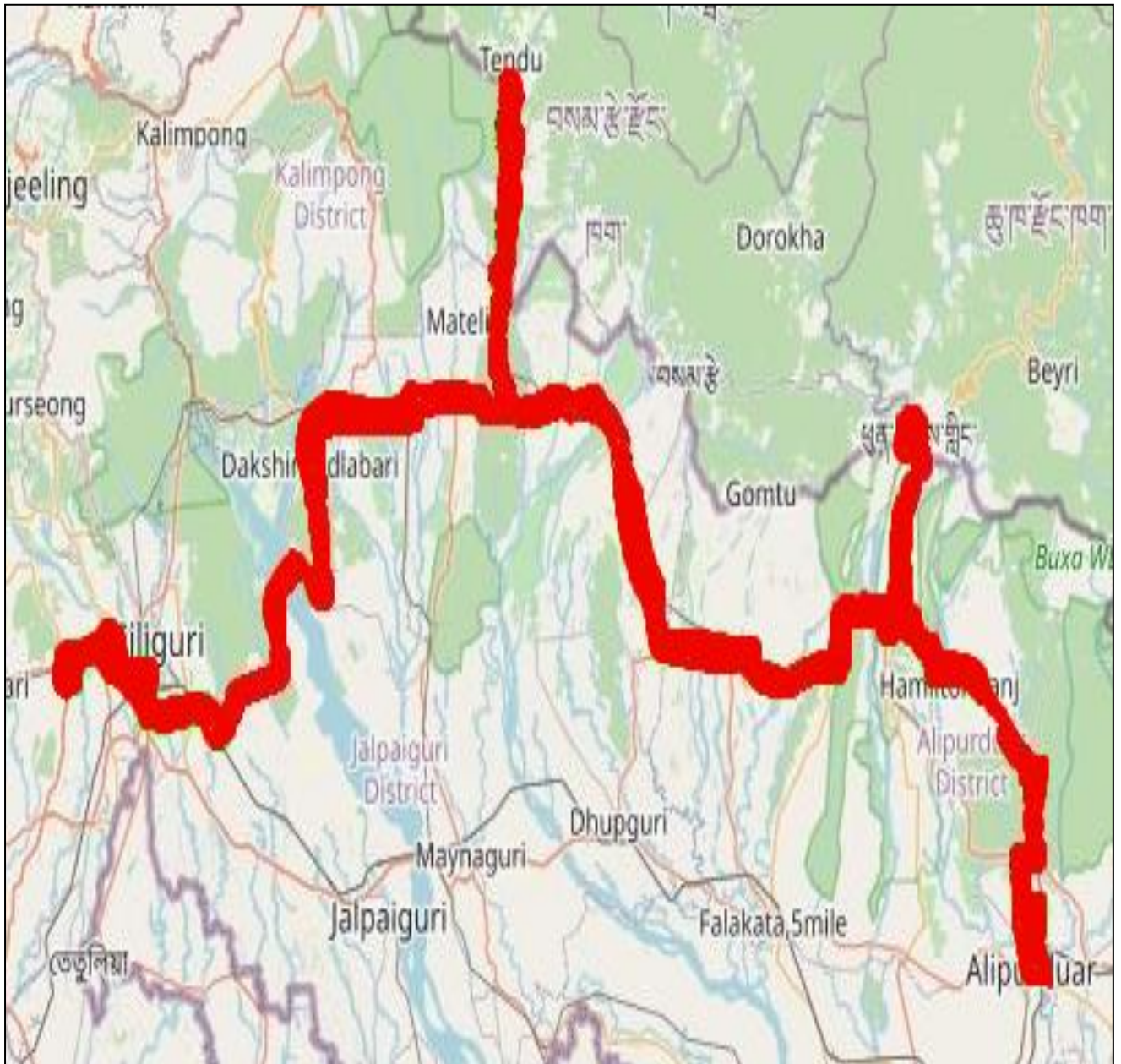
Data Tests: Dynamic Data Service Testing was performed along same route in all technologies. 500 KB file for 2G, 20MB file for 3G and 40MB file for 4G were downloaded from FTTP server in TSP's own server. Static Data Service Testing was also performed. Three 2G (Lock Mode) networks, one 3G (Lock Mode)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

DAY-1—Bagdogra Airport Parking-Fulbari-Oodlabari-Mal Bazar Sub Division Hspital-Chalsa View point-Chapamari Railway Station-Khunia More-Shipchu Primary School-Naxal check post-Garibas View Point— Jhalong check post-Paren view point-Bindu view point-Bindu Barrage-Paten Godok Gram Panchayat office-Godak Community Hall -Todey Bazar .

DAY-2—Jaldhaka Bridge Nagrakata-Luksan Hospital-Looksan Gram Panchayat office -Jaldapara National Park-Hasimara-Dalsinghpara Gram Panchayat office -Jaigaon- Gram Panchayat office II-Himalayan Institute of Engineering -Damanpur-Alipurduar Junction.

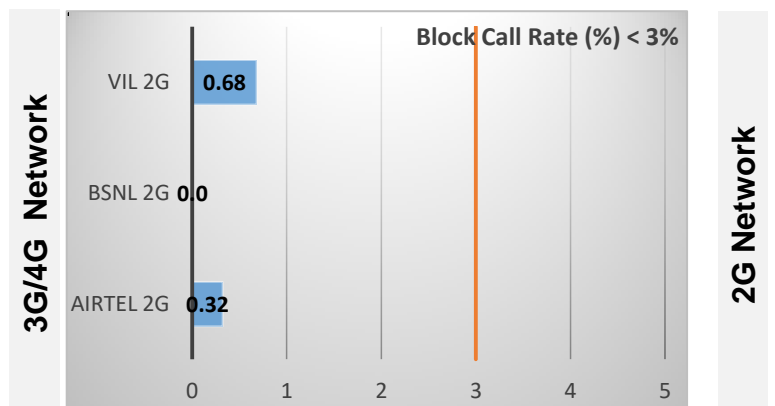
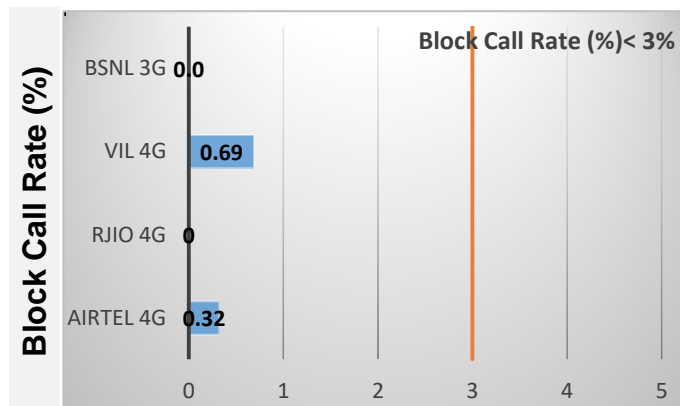
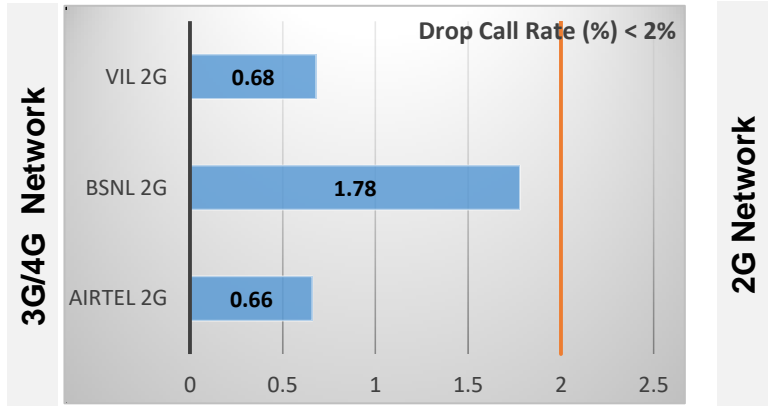
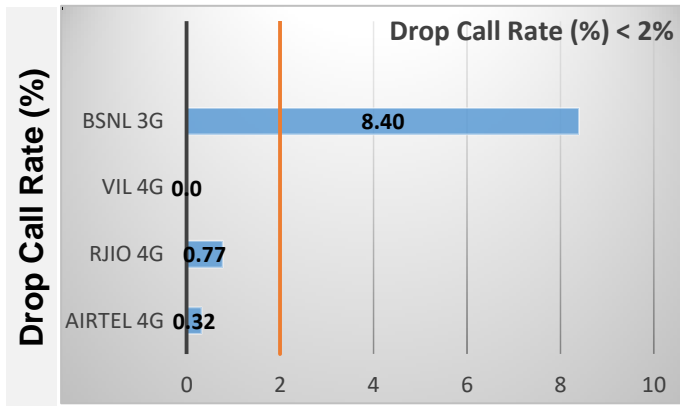
Data Service Test- Static Locations

Static Locations
Bagdogra Airport
Jaldhaka Bridge near Nagrakata

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 %	0.66	1.78	0.68	8.40	0.32	0.77	0.0
Block Call Rate %	0.32	0.0	0.68	0.0	0.32	0.0	0.69

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%) except BSNL (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 %	94.70	54.59	84.86

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

TSPs	3G	4G		
	BSNL	AIRTEL	RJIO	VIL
Coverage	39.16	94.87	89.85	83.76

Summary

City Level Summary- Voice

Voice Call	2G		
	AIRTEL	BSNL	VIL
Call Attempt	308	329	293
Blocked Call Rate (%)	0.32	0.0	0.68
CSSR% (Accessibility)	99.03	85.41	100
Drop Call Rate (%)	0.66	1.78	0.68
Mobility HOSR (%)	98.72	100	97.0
Rx Quality (%)	93.14	87.82	95.69

Voice Call	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Call Attempt	525	311	389	287
Blocked Call Rate (%)	0.0	0.32	0.0	0.69
CSSR% (Accessibility)	74.86	99.36	97.68	98.95
Drop Call Rate (%)	8.40	0.32	0.77	0.0
Mobility HOSR (%)	100	99.72	97.50	96.92
Rx Quality (%)	74.33	87.90	85.70	84.68

Summary-Data Services Dynamic

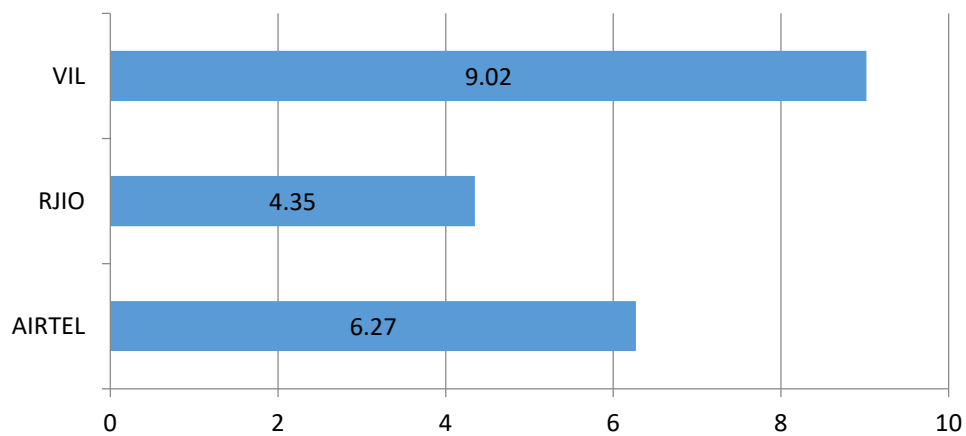
Key Observations

Dynamic Data was tested for 330 Kms. Download Throughput was tested.

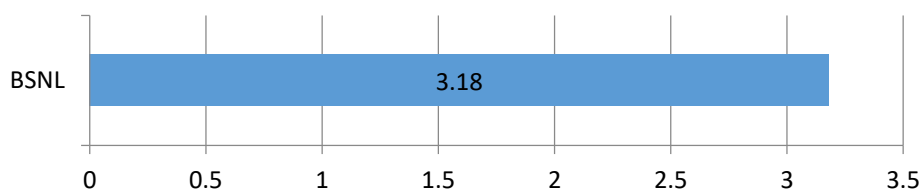
Data Download Performance (Average Throughput in Mbps) - Dynamic Data Testing

4G/3G Network:

4G-Dynamic Download Average Throughput (Mbps)



3G-Dynamic Download Average Throughput (Mbps)



Summary-Data Services Static

City Level Summary-

Average Data Services Static	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	127.22	49.75	77.23
Upload Throughput (kbps)	20.205	17.0	45.85
Web Browsing Delay (sec)	2.0	23.62	38.38
Latency (msec)	275.5	2.88	222

Average Data Services Static	3G/ 4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	3.54	14.74	9.41	15.10
Upload Throughput in Mbps	1.11	7.02	4.21	18.56
Video streaming delay (secs)	11.50	0.50	0.50	1.52
Web Browsing Delay (secs)	4.41	0.27	2.0	2.50
Latency (msec)	1.93	36.5	50.70	95

Summary-Data Services Static

Location Level Summary-

Location:-Bagdogra Airport	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	183.46	73.18	79.14
Upload Throughput (kbps)	23.22	21.0	46.98
Web Browsing Delay (sec)	1.90	25.58	37.17
Latency (msec)	267	2.67	216

Location:-Bagdogra Airport	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	3.26	13.40	6.25	10.77
Upload Throughput in Mbps	0.92	5.08	5.36	11.51
Video streaming delay (secs)	10.70	0.42	0.50	1.75
Web Browsing Delay (secs)	5.18	0.31	2.0	3.0
Latency (msec)	1.47	32	48.20	110

Location:- Jaldhaka Bridge near Nagrakata	2G		
	AIRTEL	BSNL	VIL
Download throughput in (kbps)	70.98	26.32	75.32
Upload Throughput in (kbps)	17.19	13.0	44.71
Web Browsing Delay (secs)	2.10	21.67	39.59
Latency (msec)	284	3.09	227

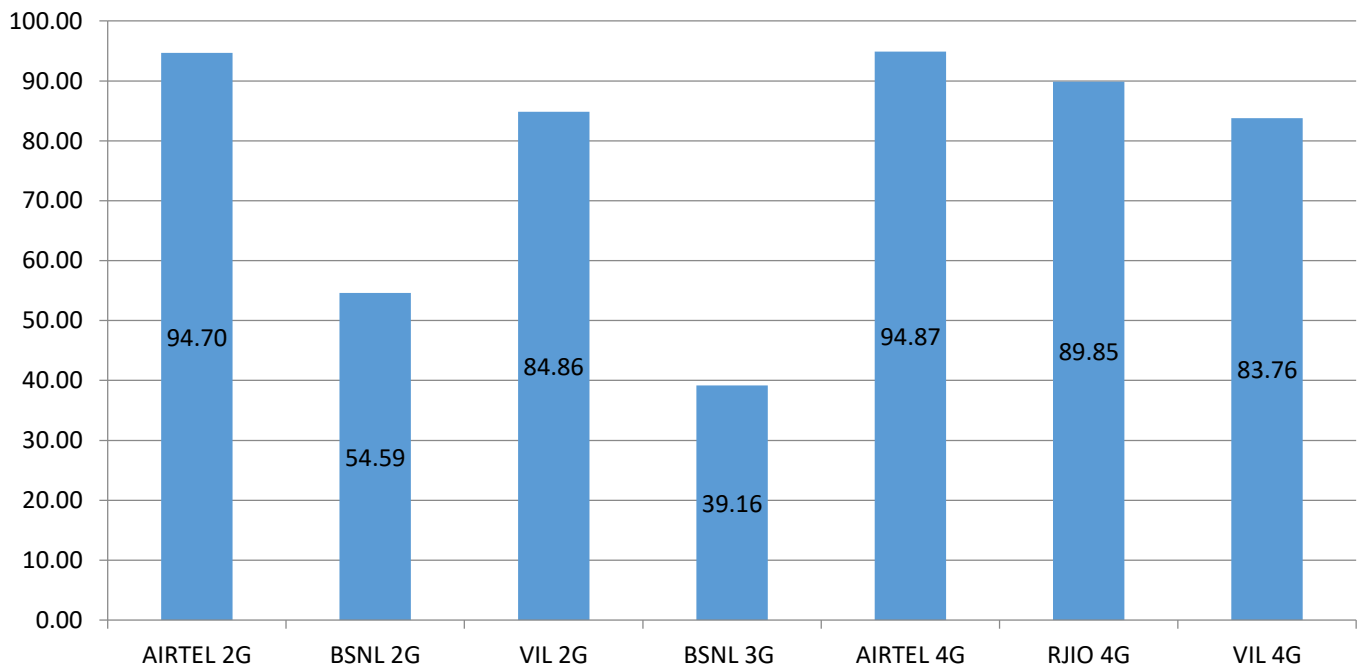
Location:- Jaldhaka Bridge near Nagrakata	4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in (mbps)	3.82	16.08	12.57	19.44
Upload Throughput in (mbps)	1.31	8.96	3.06	25.62
Video streaming delay (secs)	12.30	0.57	0.50	1.28
Web Browsing Delay (secs)	3.65	0.23	2.10	2.0
Latency (msec)	2.40	41	53.20	79.13

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	94.70
BSNL 2G	54.59
VIL 2G	84.86
BSNL 3G	39.16
AIRTEL 4G	94.87
RJIO 4G	89.85
VIL 4G	83.76

Coverage Rate %



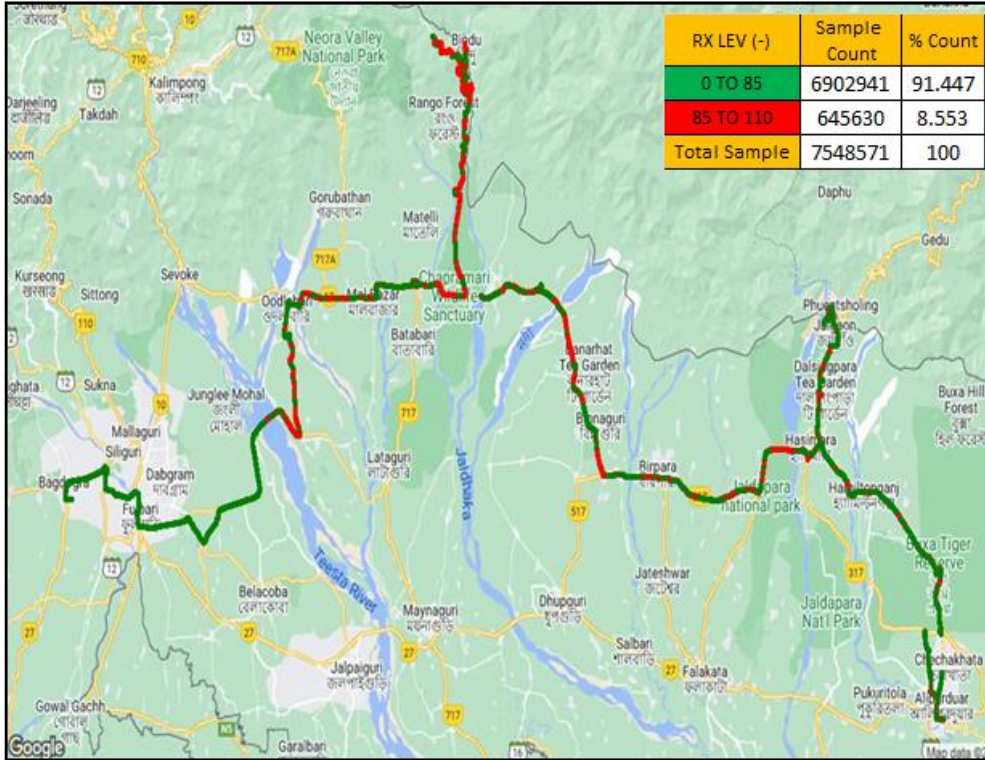
Note- Coverage is the percentage of samples having signal strength more than the threshold value (2G ≥ -85 dbm, 3G ≥ -90 dbm and 4G ≥ -110 dbm). However, these samples are only for the portion of the OADT routes where TSPs have coverage i.e 'no coverage' routes have been excluded.

I. Coverage Details

AIRTEL

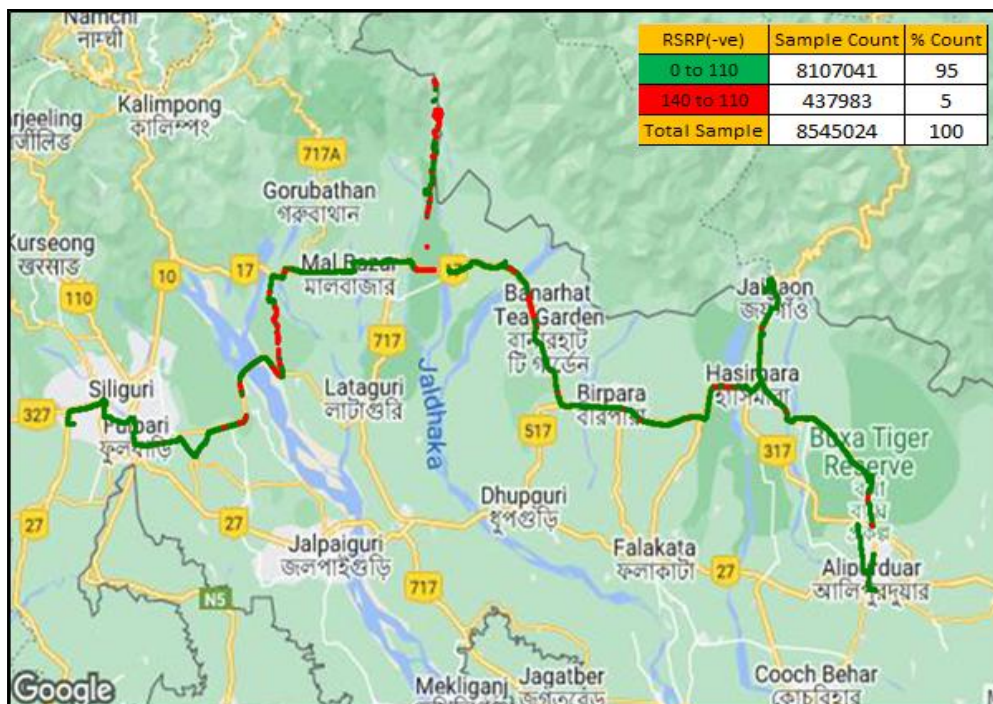
Technology	Coverage Rate %
2G	94.70
4G	94.87

2G



Overall Rx Level	Sample %
[Max >=-75]	56.13
[-75 >=-85)	38.61
[-85 >=-95)	1.68
[-95 >=Min)	3.59
Total	100

4G



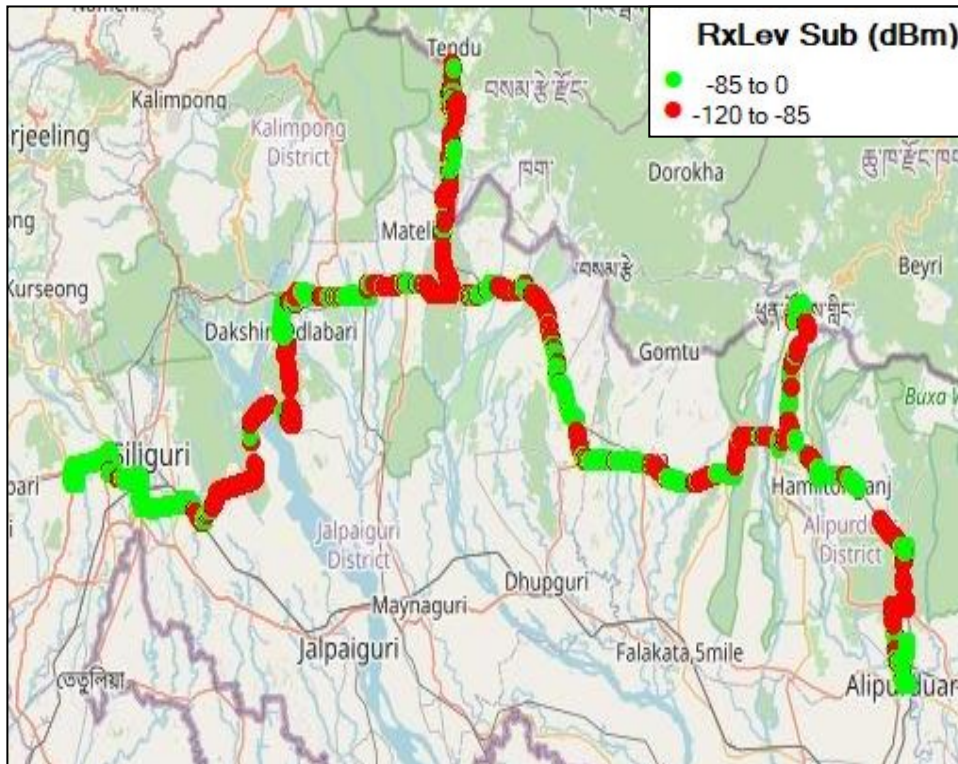
Overall RSRP	Sample %
[Max >=-80]	36.68
[-80 >=-90)	9.66
[-90 >=-110)	48.54
[-110 >=Min)	5.13
Total	100

I. Coverage Details

BSNL

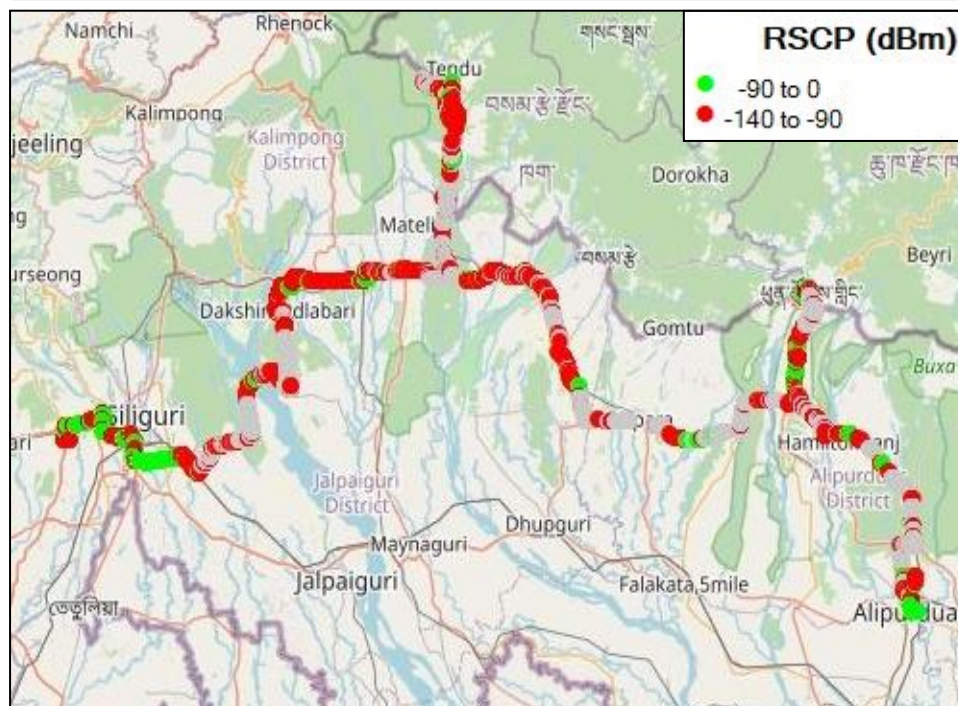
Technology	Coverage Rate %
2G	54.59
3G	39.16

2G



Overall RxLevel	Sample %
[Max >=-75]	29.30
[-75 >=-85)	25.30
[-85 >=-95)	34.85
[-95 >=Min)	10.55
Total	100

3G

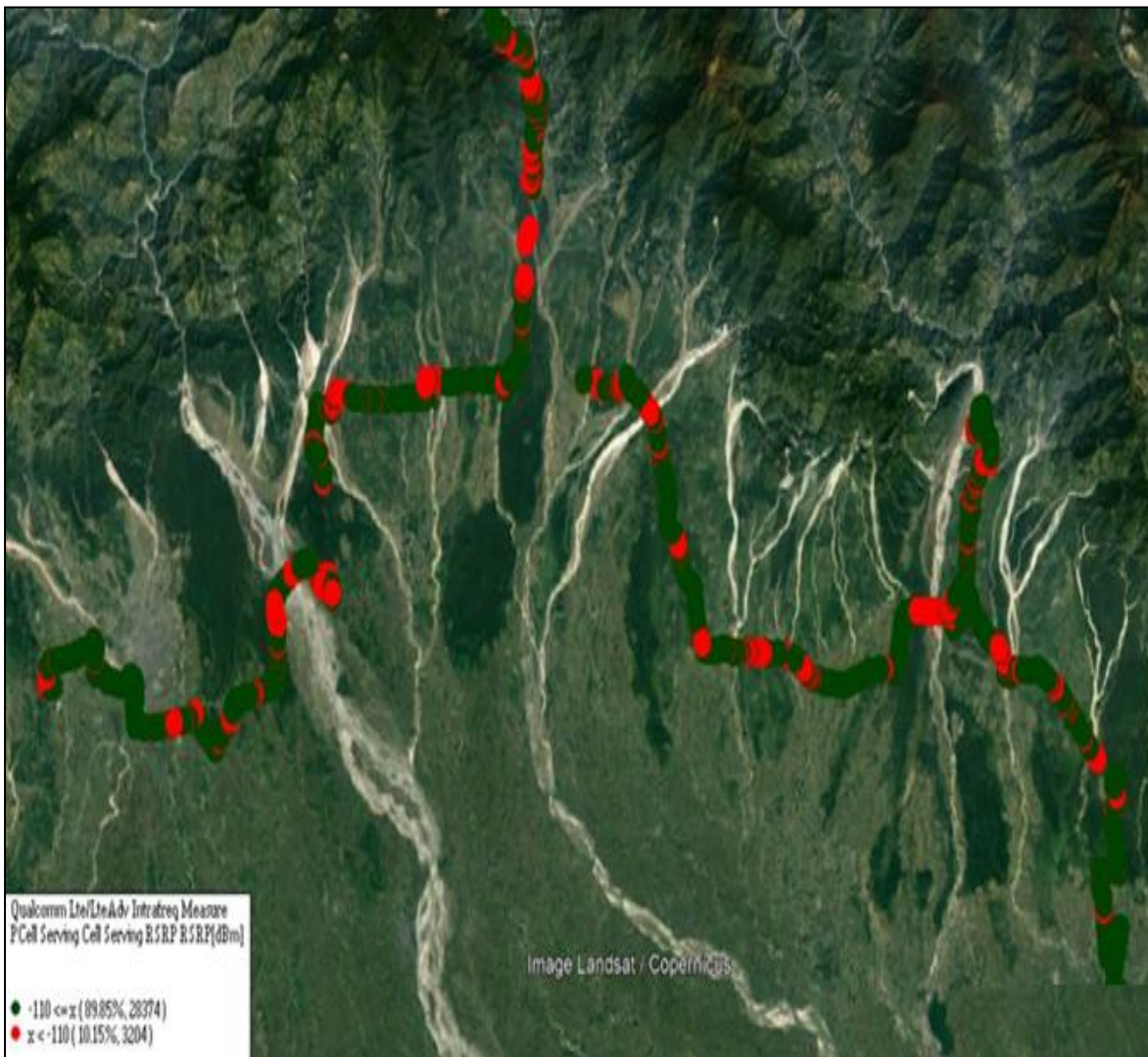


Overall RSCP	Sample %
[Max >=-70]	8.47
[-70 >=-80)	13.65
[-80 >=-90)	17.04
[-90 >=Min)	60.84
Total	100

I. Coverage Details

RJIO

Technology	Coverage Rate %
4G	89.85
4G	



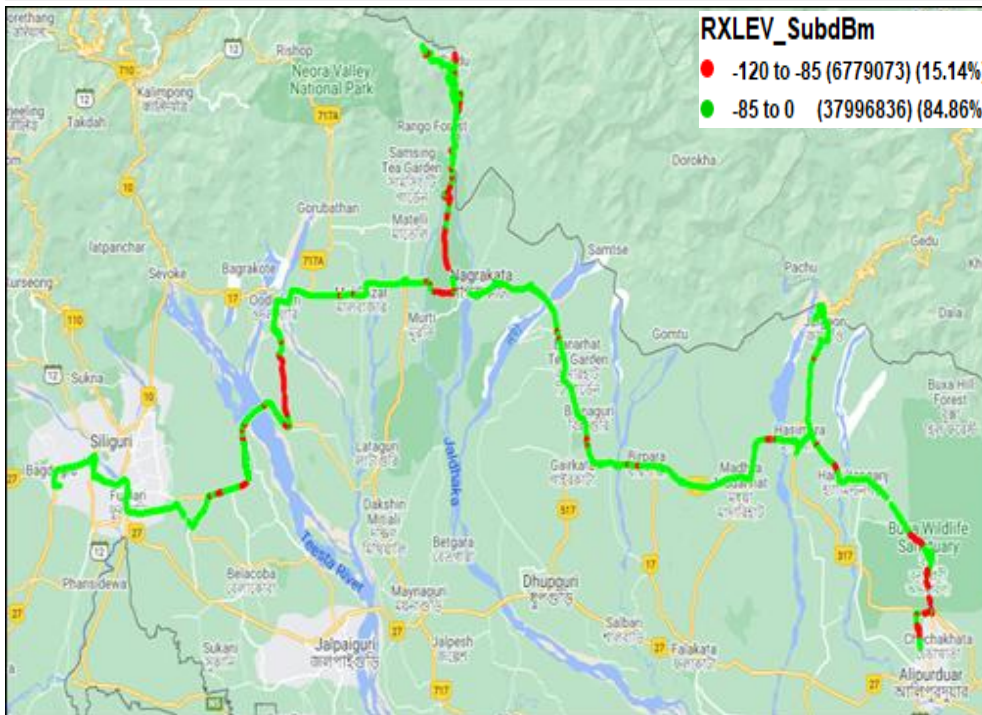
Overall RSRP	Sample %
[Max \geq -80]	16.06
[-80 \geq -90)	18.51
[-90 \geq -110)	55.28
[-110 \geq Min)	10.15
Total	100

I. Coverage Details

VIL

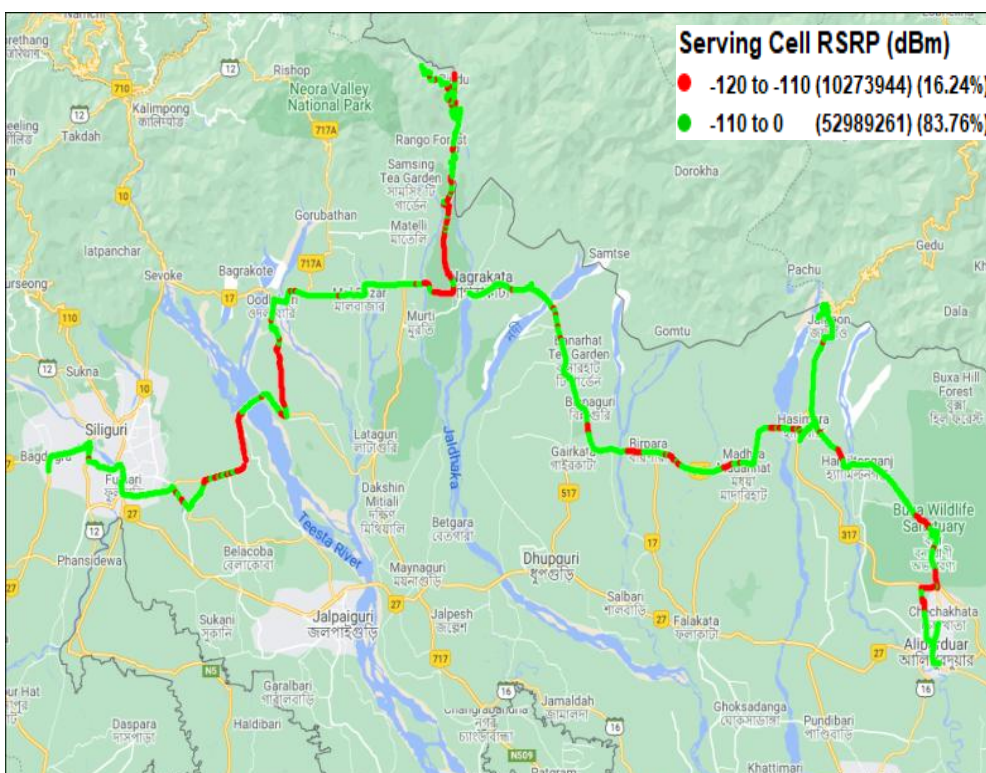
Technology	Coverage Rate %
2G	84.86
4G	83.76

2G



Overall RxLevel	Sample %
[Max >=-75]	51.57
[-75 >=-85]	33.29
[-85 >=-95]	9.34
[-95 =Min)	5.80
Total	100

4G



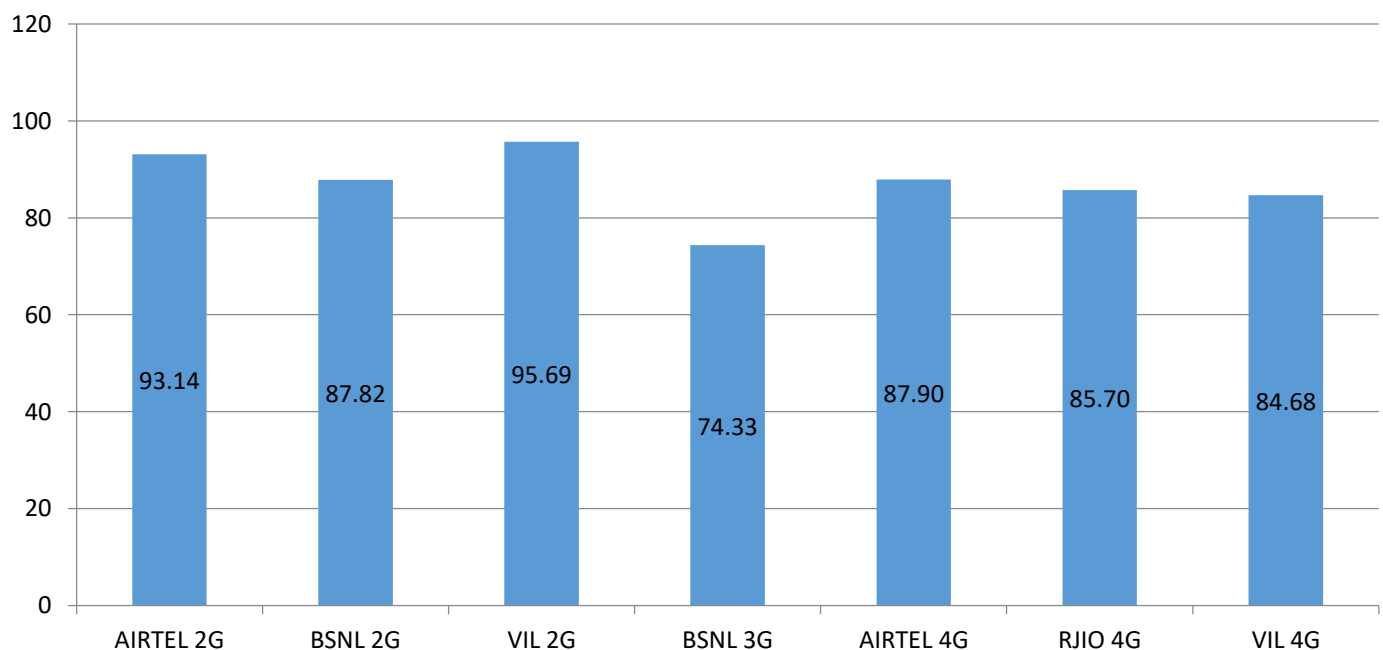
Overall RSRP	Sample %
[Max >=-80]	11.56
[-80 >=-90]	51.90
[-90 >=-110]	20.30
[-110 >=Min)	16.24
Total	100

II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Quality ≤ 5 for GSM, Ec/No ≥ -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	93.14
BSNL 2G	87.82
VIL 2G	95.69
BSNL 3G	74.33
AIRTEL 4G	87.90
RJIO 4G	85.70
VIL 4G	84.68

Rx Quality %

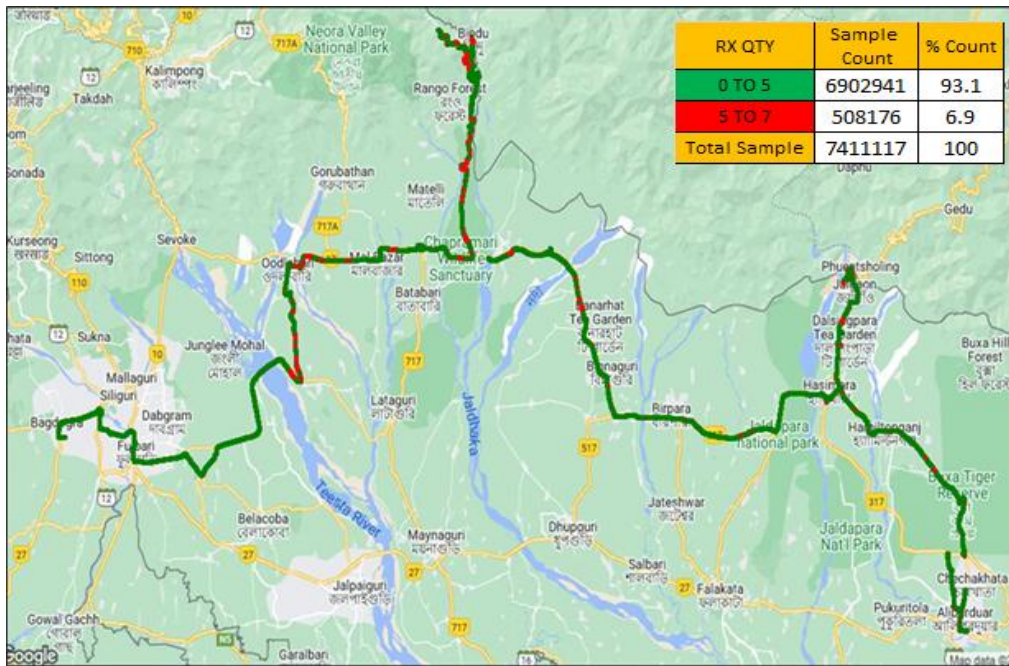


II. Quality Details

AIRTEL

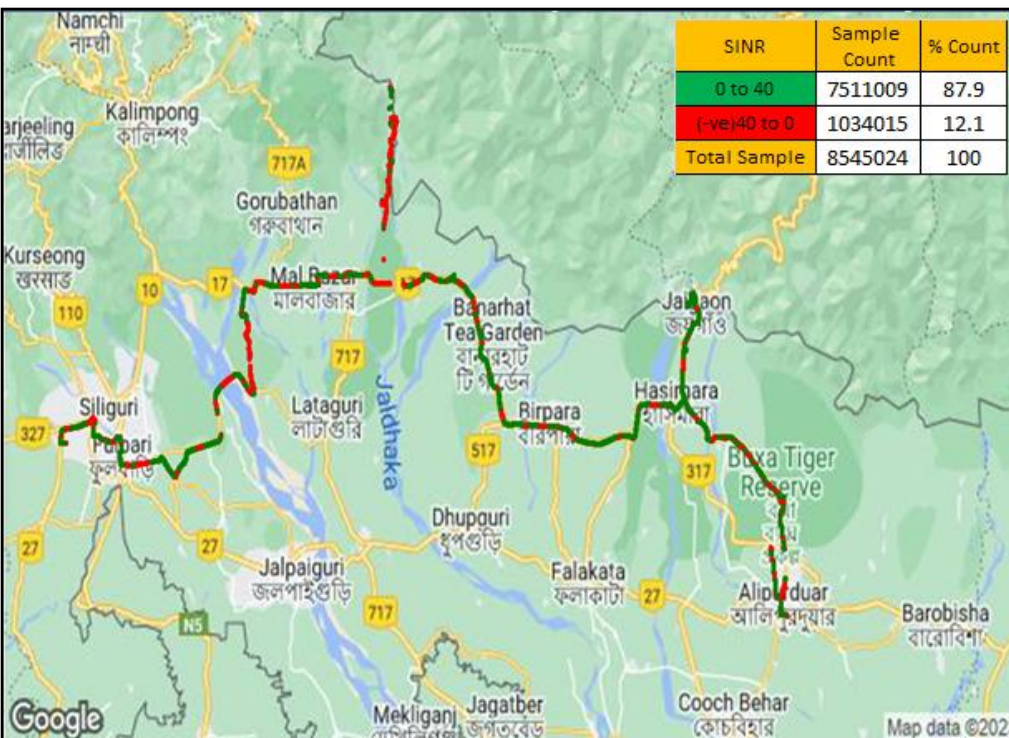
Technology	Rx Quality %
2G	93.14
4G	87.90

2G



Overall Rx Quality	Sample %
(Min <=2)	86.57
(2 <=3)	1.63
(3 <=4)	2.67
(4 <=5)	2.27
(5 <=Max)	6.86
Total	100%

4G



Overall SINR	Sample %
(Min <=0)	12.10
(0 <=5)	37.59
(5 <=10)	37.05
(10 <=15)	8.54
(15 <=Max)	4.73
Total	100%

II. Quality Details

BSNL

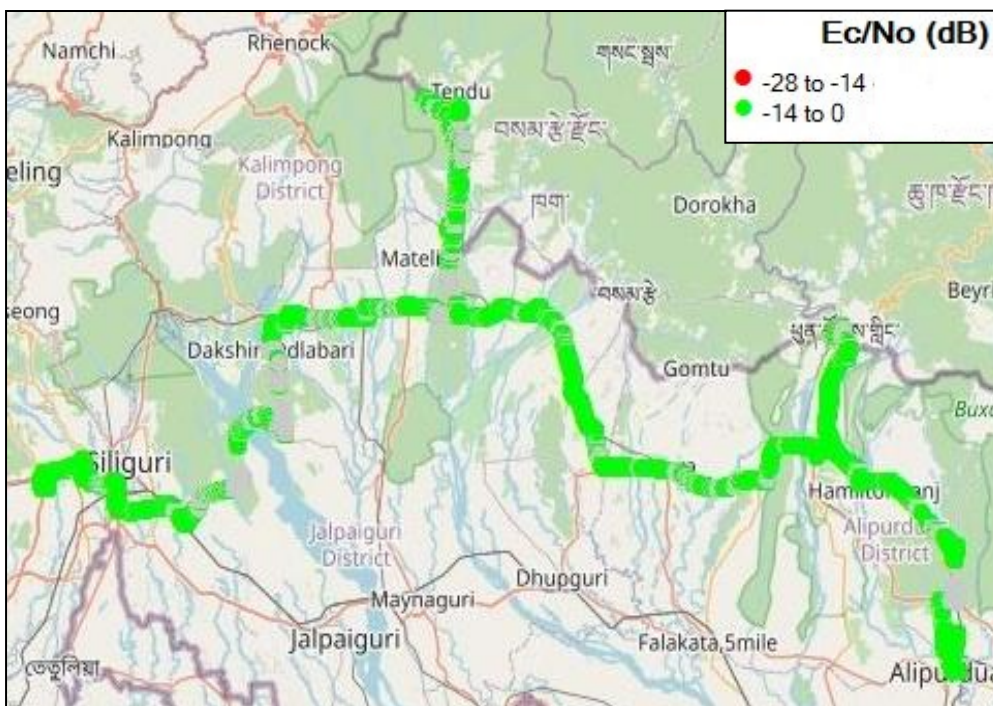
Technology	Rx Quality %
2G	87.82
3G	74.33

2G



Overall Rx Quality	Sample %
(Min <=2)	73.80
(2 <=3)	4.76
(3 <=4)	4.84
(4 <=5)	4.42
(5 <=Max)	12.18
Total	100

3G

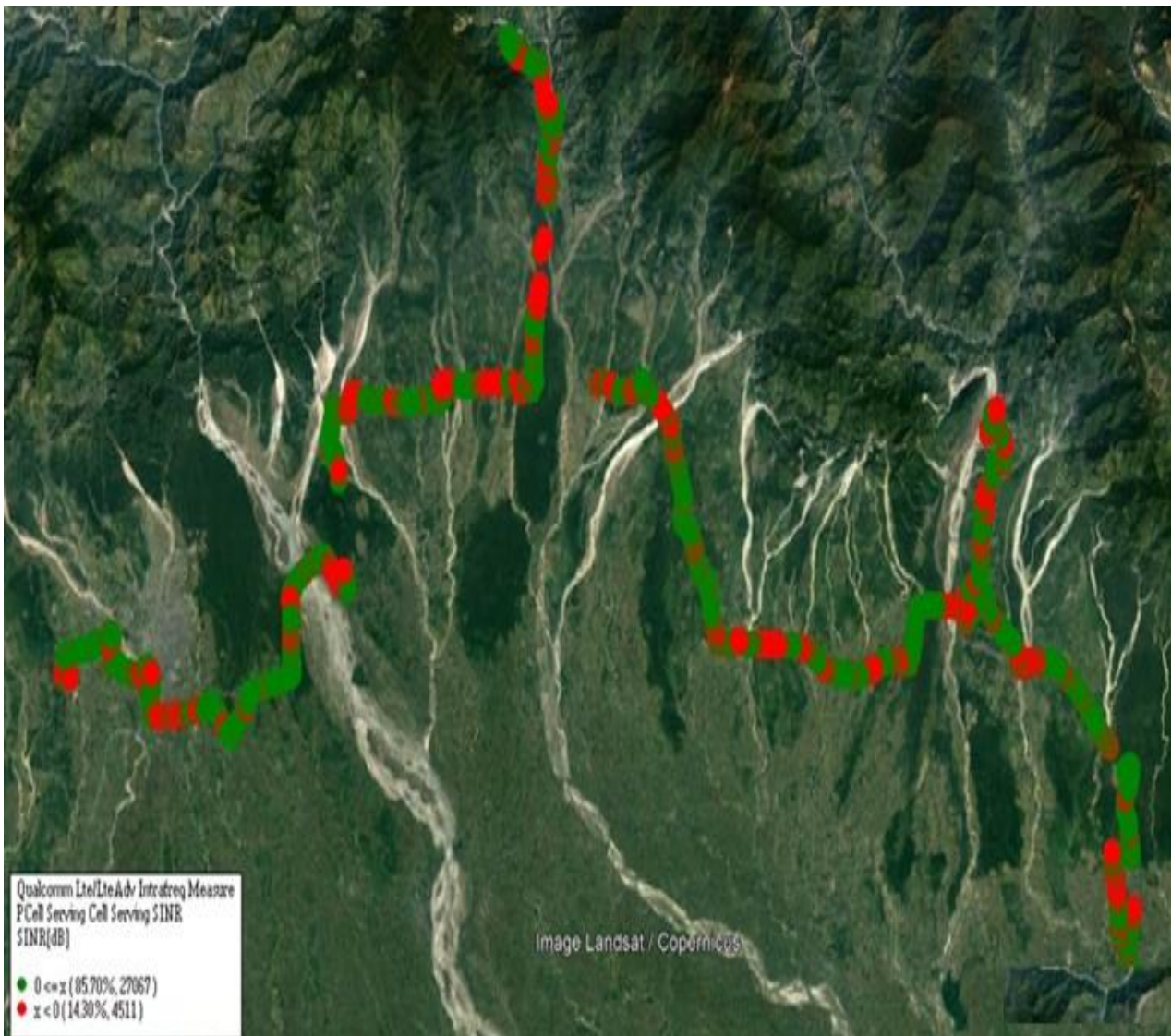


Overall EcNo	Sample %
(Max <=-6)	9.71
(-6 <=-9)	12.59
(-9 <=-11)	27.67
(-11 <=-14)	24.36
(-14 <= Min)	25.67
Total	100

II. Quality Details

RJIO

Technology	Rx Quality %
4G	85.70
4G	



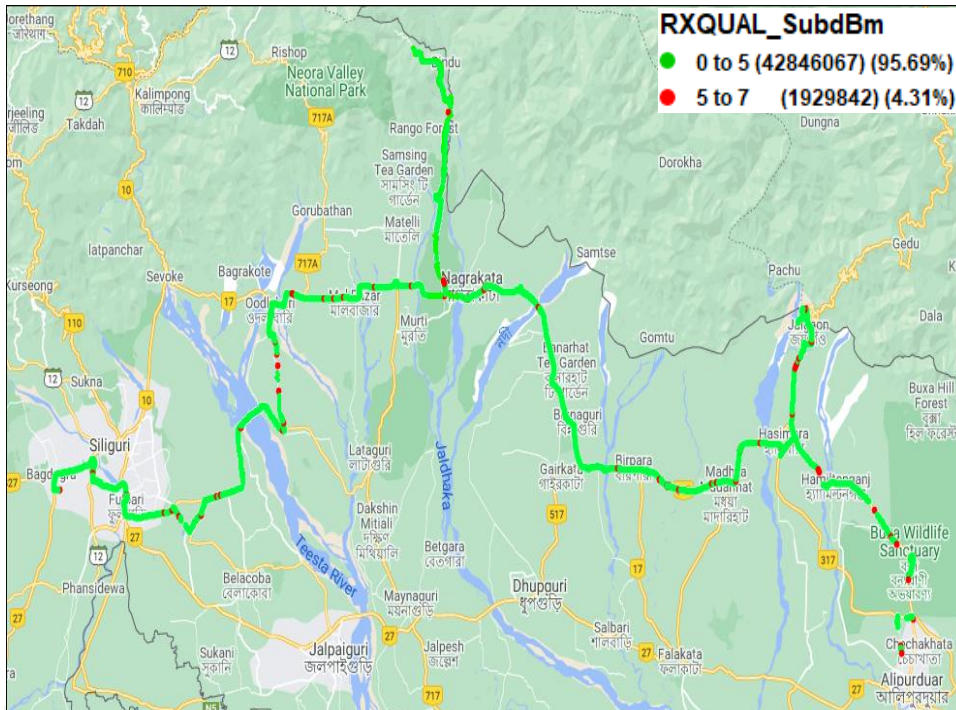
Overall SINR	Sample %
(Min \leq 0)	14.3
(0 \leq 5)	24.89
(5 \leq 10)	22.88
(10 \leq 15)	17.83
(15 \leq Max)	20.1
Total	100

II. Quality Details

VIL

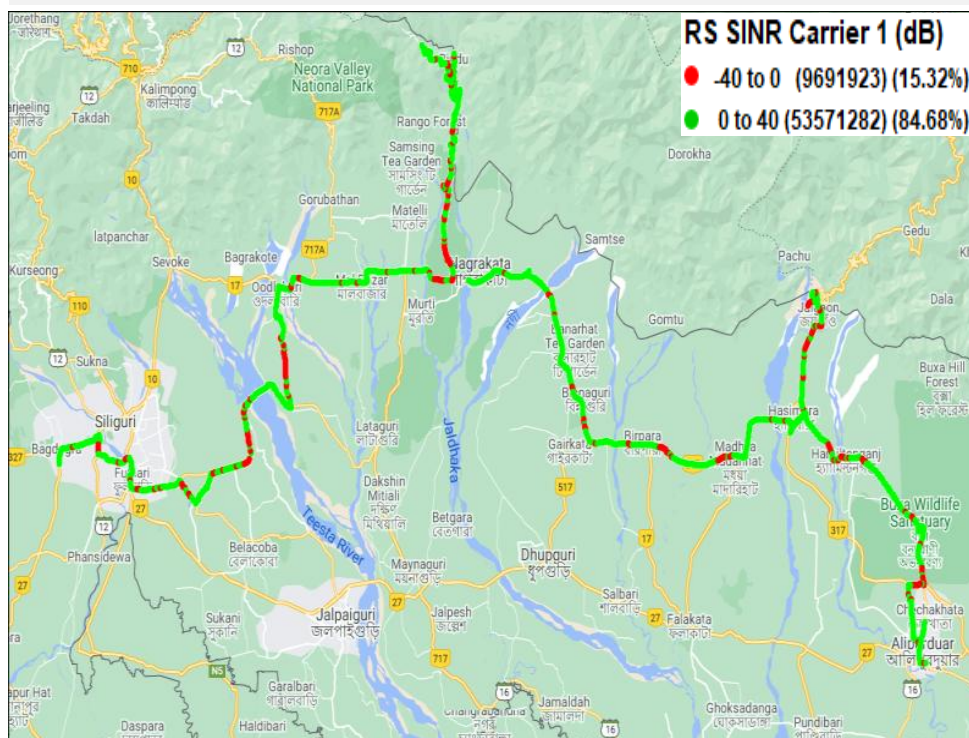
Technology	Rx Quality %
2G	95.69
4G	84.68

2G



Overall Rx Quality	Sample %
(Min <=2)	74.18
(2 <=3)	7.27
(3 <=4)	6.59
(4 <=5)	7.65
(5 <=Max)	4.31
Total	100

4G



Overall SINR	Sample %
(Min <=0)	15.32
(0 <=5)	25.90
(5 <=10)	19.88
(10 <=15)	15.13
(15 <=Max)	23.77
Total	100

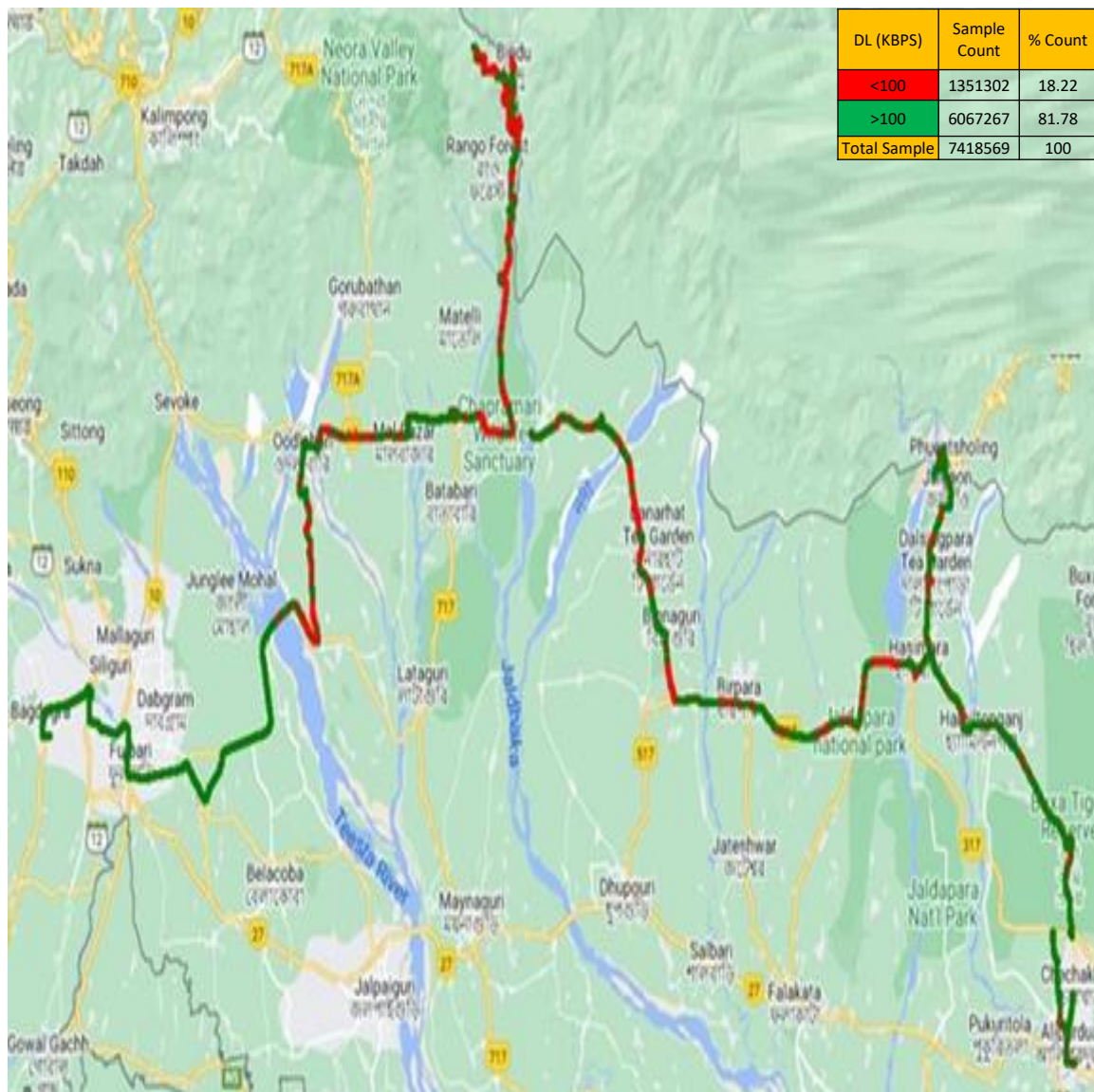
IV. Dynamic Data Test- 2G DL Details

AIRTEL

Dynamic Data Testing Complete 330 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	119.0

2G



AVG. DOWNLOAD SPEED (Kbps)	119.0
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 50 Kbps	5.10
50 to 100 Kbps	13.12
100 to 200 Kbps	68.79
200 to 300 Kbps	12.80
>300 Kbps	0.19
Total	100%

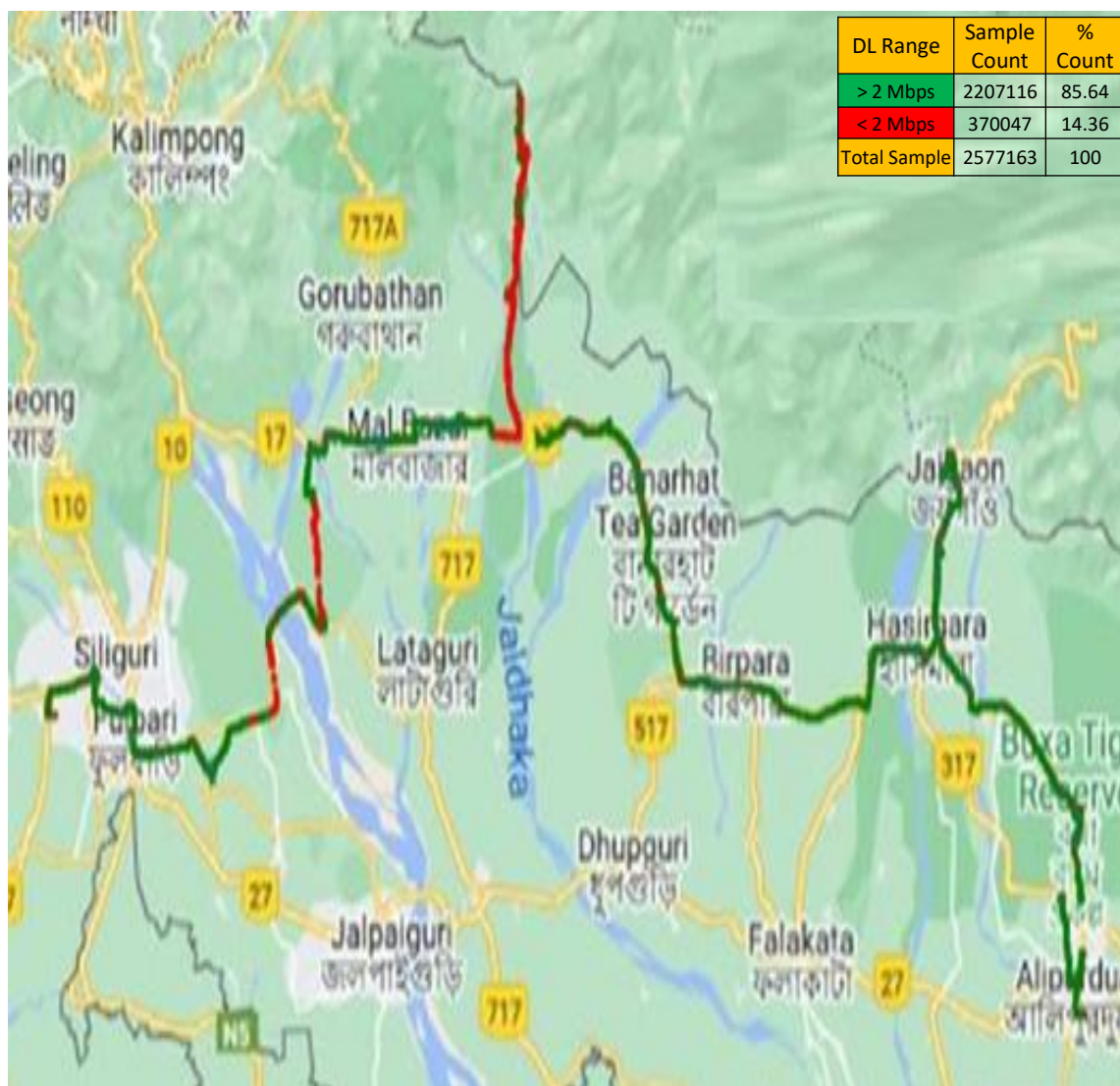
IV. Dynamic Data Test- 4G DL Details

AIRTEL

Dynamic Data Testing Complete 330 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	6.27

4G



AVG. DOWNLOAD SPEED (Mbps)	6.27
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 1 Mbps	6.21
1 to 2 Mbps	8.14
2 to 5 Mbps	52.68
5 to 10 Mbps	26.03
>10 Mbps	6.93
Total	100%

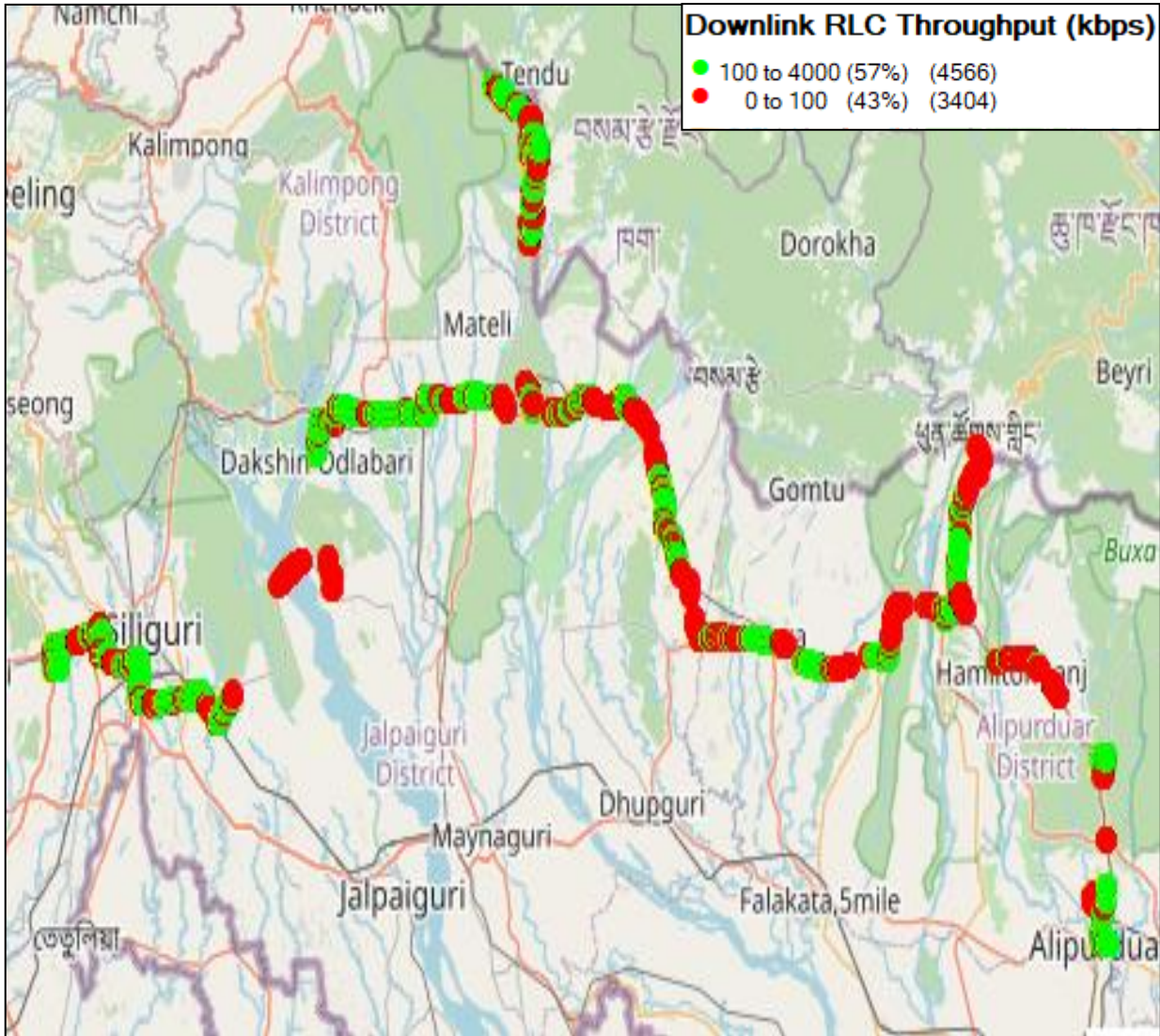
IV. Dynamic Data Test- 2G DL Details

BSNL

Dynamic Data Testing Complete 330 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	173.60

2G



AVG. DOWNLOAD SPEED (Kbps)	173.60
% FILE TRANSFER COMPLETE	83.88
DL throughput	Sample %
0 to 50 Kbps	26.37
50 to 100 Kbps	16.34
100 to 200 Kbps	33.76
200 to 300 Kbps	23.43
>300 Kbps	0.1
Total	100

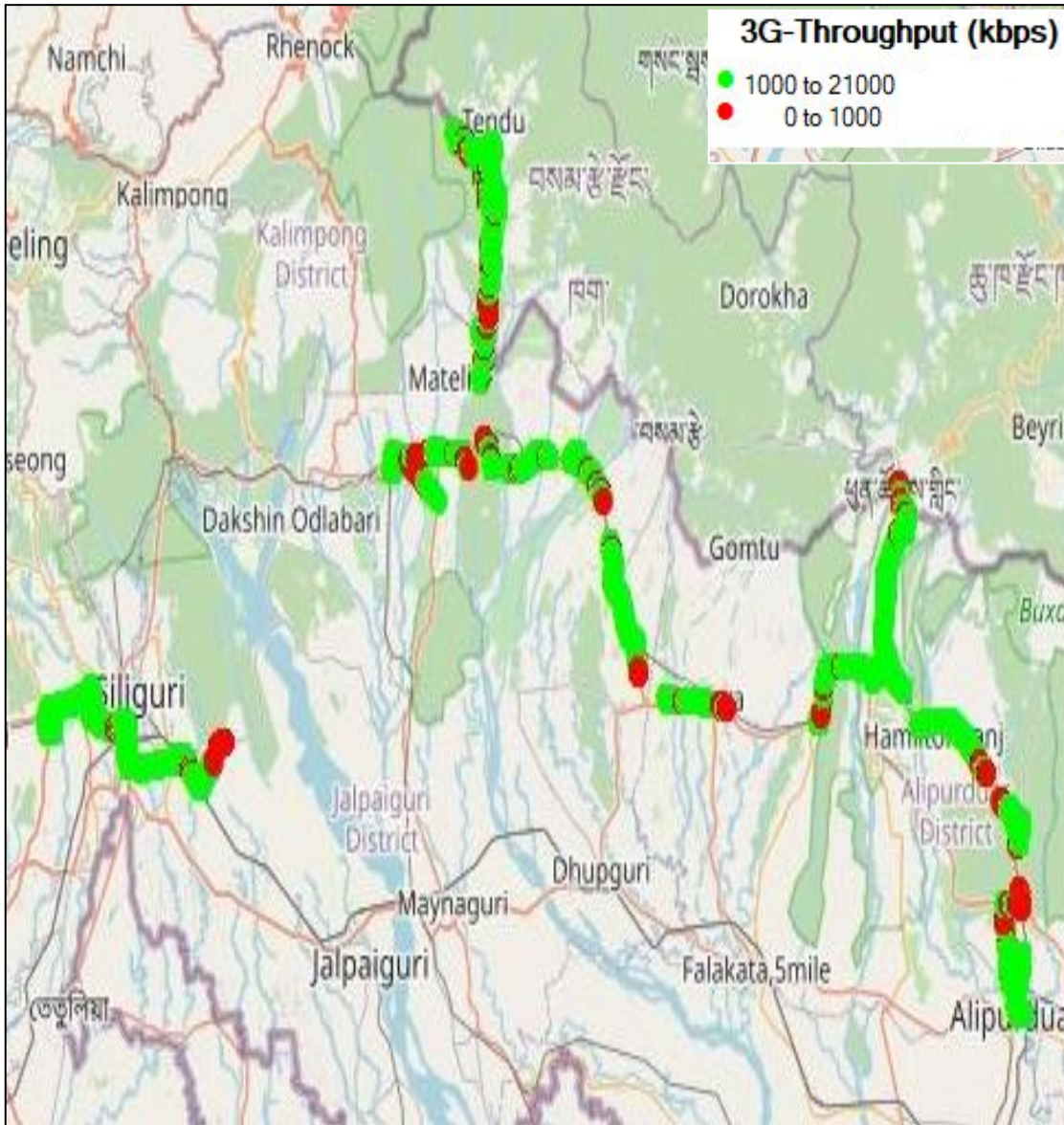
IV. Dynamic Data Test- 3G DL Details

BSNL

Dynamic Data Testing Complete 330 Kms

Data KPIs - Overall	3G
Average Download Throughput (Mbps)	3.18

3G



AVG. DOWNLOAD SPEED (Mbps)	3.18
% FILE TRANSFER COMPLETE	70.44
DL throughput	Sample %
0 to 0.5 Mbps	4
0.5 to 1 Mbps	7.50
1 to 2 Mbps	15.60
2 to 5 Mbps	32
>5 Mbps	40.90
Total	100

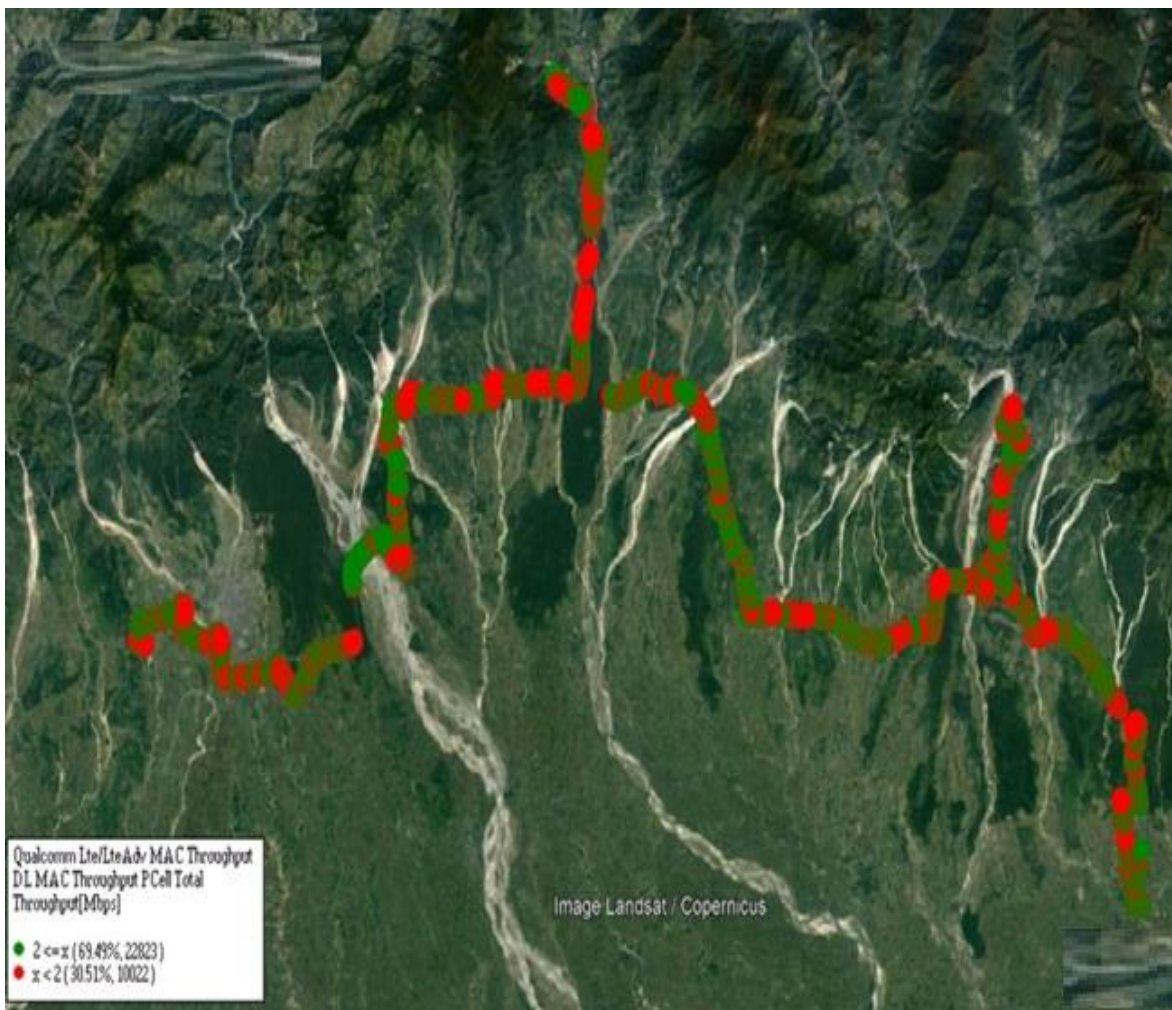
IV. Dynamic Data Test- 4G DL Details

RJIO

Dynamic Data Testing Complete 330 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	4.35

4G



AVG. DOWNLOAD SPEED (Mbps)	4.35
% FILE TRANSFER COMPLETE	99.70
DL throughput	Sample %
0 to 1 Mbps	18.15
1 to 2 Mbps	12.36
2 to 5 Mbps	42.88
5 to 10 Mbps	14.09
>10 Mbps	12.52
Total	100

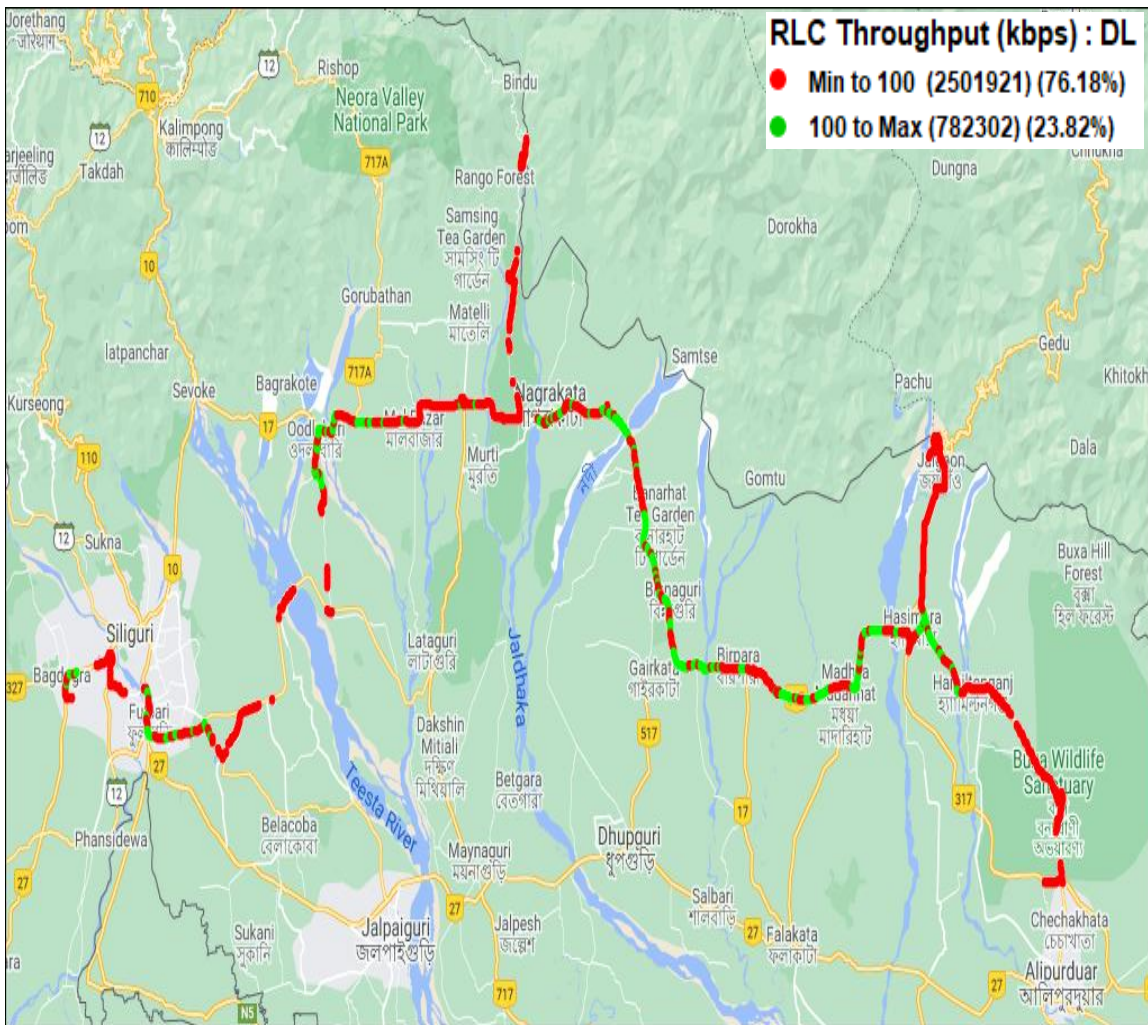
IV. Dynamic Data Test-2G DL Details

VIL

Dynamic Data Testing Complete 330 Kms

Data KPIs – Overall	2G
Average Download Throughput (Kbps)	77.98

2G



AVG. DOWNLOAD SPEED (Kbps)	77.98
% FILE TRANSFER COMPLETE	79.12
DL throughput	Sample %
0 to 50 Kbps	71.38
50 to 100 Kbps	4.80
100 to 200 Kbps	10.49
200 to 300 Kbps	13.32
>300 Kbps	0.01
Total	100

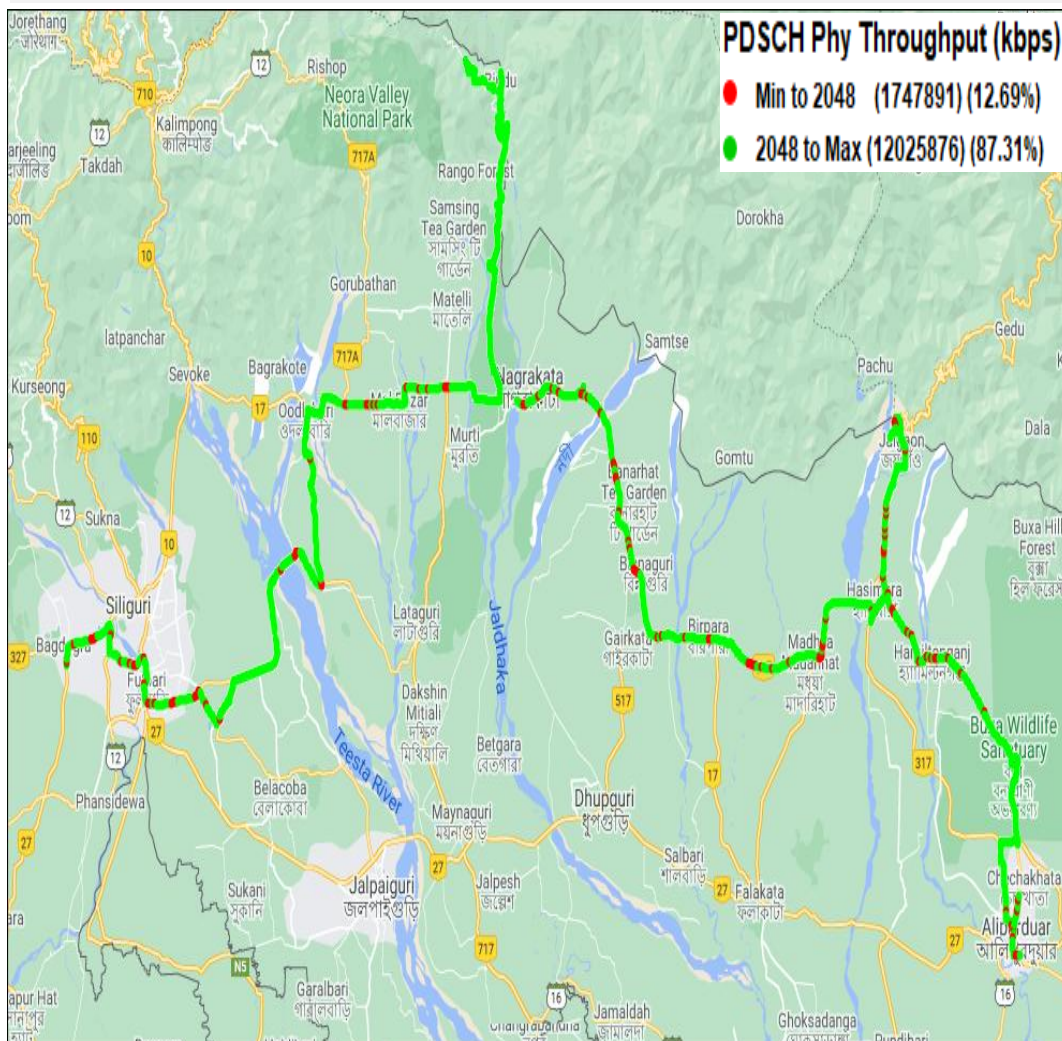
IV. Dynamic Data Test- 4G DL Details

VIL

Dynamic Data Testing Complete 330 Kms

Data KPIs – Overall	4G
Average Download Throughput (Mbps)	9.02

4G



AVG. DOWNLOAD SPEED (Mbps)	9.02
% FILE TRANSFER COMPLETE	98.83
DL throughput	Sample %
0 to 1 Mbps	10.33
1 to 2 Mbps	2.36
2 to 5 Mbps	33.58
5 to 10 Mbps	24.03
>10 Mbps	29.70
Total	100