

Operator Assisted Drive Test Report

Tura & Resubelpara, Meghalaya

February, 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-Block Call Rate in 2G & 3G network, Drop Call Rate in 2G & 3G network, Call Setup Success Rate in 3G network, Handover Success Rate in 2G & 3G network and Rx Quality in 2G & 3G(Ec/Io) network.

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

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

It is observed that 2G & 4G coverage of VIL and 2G & 3G coverage of BSNL on some portions of the OADT routes are inadequate

The Operator Assisted Drive Test has been carried out by Regional Office, Kolkata with the help of Service Providers in Tura & Resubelpara, Meghalaya and surrounding areas including National Highway (217) on 29th February & 1st March 2024 from 08.30 AM to 08.30 PM. The drive test covered drive route of 583 KMs (approx) over a period of 2 days. Approximately 217+ 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

Tura is a municipality in the West Garo Hills district of the Indian state of Meghalaya. One of the largest towns in Meghalaya, Tura is located in the foothills of the Nokrek range of Garo Hills.

Resubelpara, also known as Resu, is the headquarters of North Garo Hills District in the state of Meghalaya in India. The town is situated along the Damring River.

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.

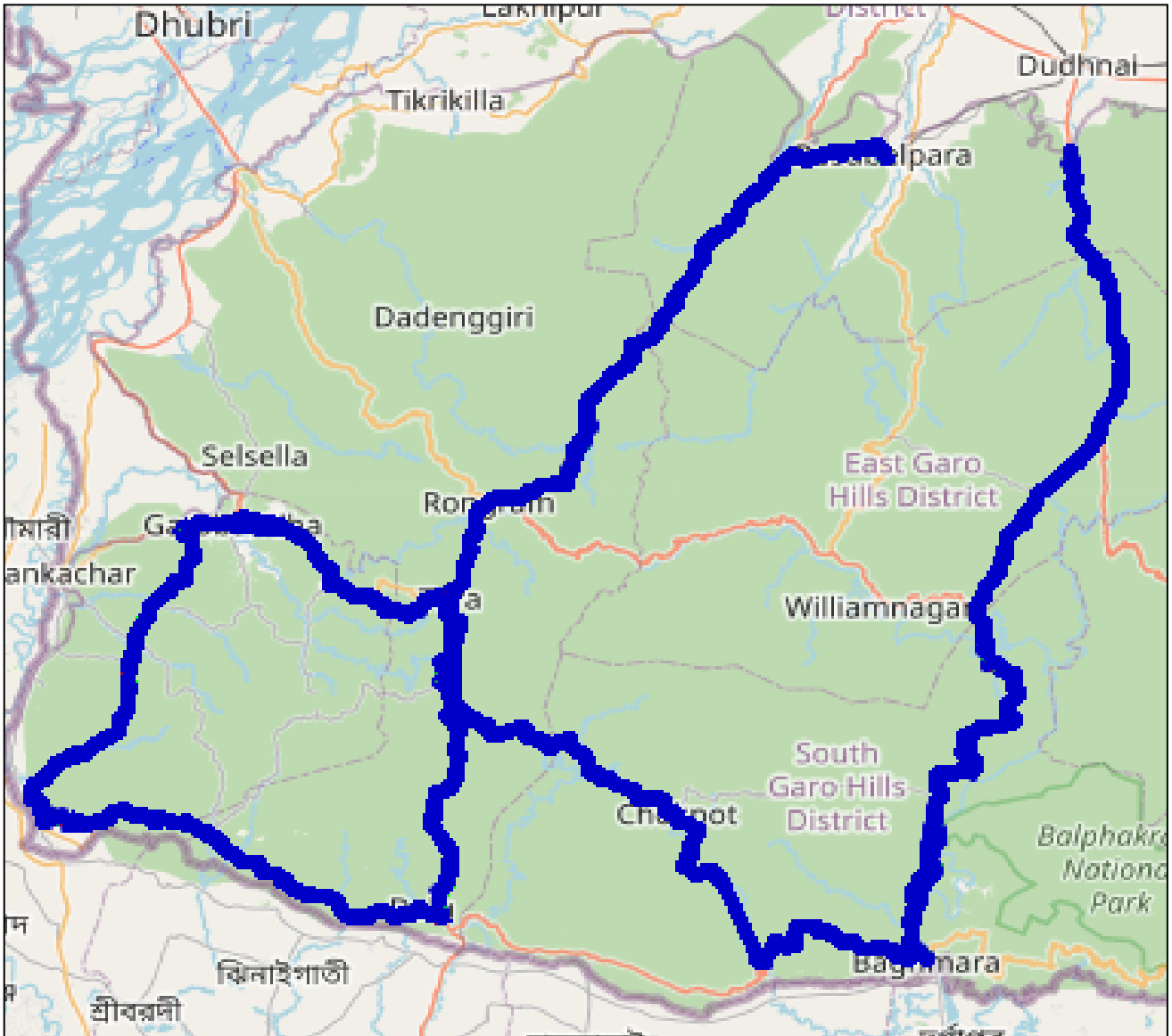
Data Tests: Dynamic Data Service Testing was performed along same route in all technologies. 500 KB file for 2G, 20MB file for 3G and 40MB file for 4G were downloaded from FTTP server in TSP's own server. Static Data Service Testing was also performed. Three 2G (Lock Mode) networks, one 3G (Lock Mode)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

DAY-1—DMHO Office, Resubelpara-Konapara-Bakenang Songma-Bajengdoba Police Station-Rari police Station-Rongramgre-Nigamota view Point-Megagre-Jenjal Police Station-Samingre-Aguragre View Point-Asanang-Rongram-Pagugre-Amakgri-Ambari-Garbodha PS-Betasing-Ampati Civi Hospital- Kalipara-Zikzak Police Station- Kalaipara Post Office- Mahendraganj Junction- Purakhasia Police Station-Dalam Bus Stand- Barengapara Bazar- Adugachol-Machangpani Secondary School-Bolchigre Post Office-Tura Police Station.

DAY-2-Dalugre Playground-Sangknigre Police Station-Ganchikalak Busstand-BDO Complex, Chokpot-Raksrang Ch Sangma University-Raksrang Ch Sangma University-Chambil Badima Govt. Lp School-Baghamara-India-Bangladesh Border-Rongdik Bridge-Siju Post Office-Jadi Gittim-Nongalbira-Rongregre-Nengkra Check Post-Dobu Market-Rongieng Chc-Rongmil Secondary School-Wagasi Public Health Center-Dokasaram-Dainadubi Police Station.

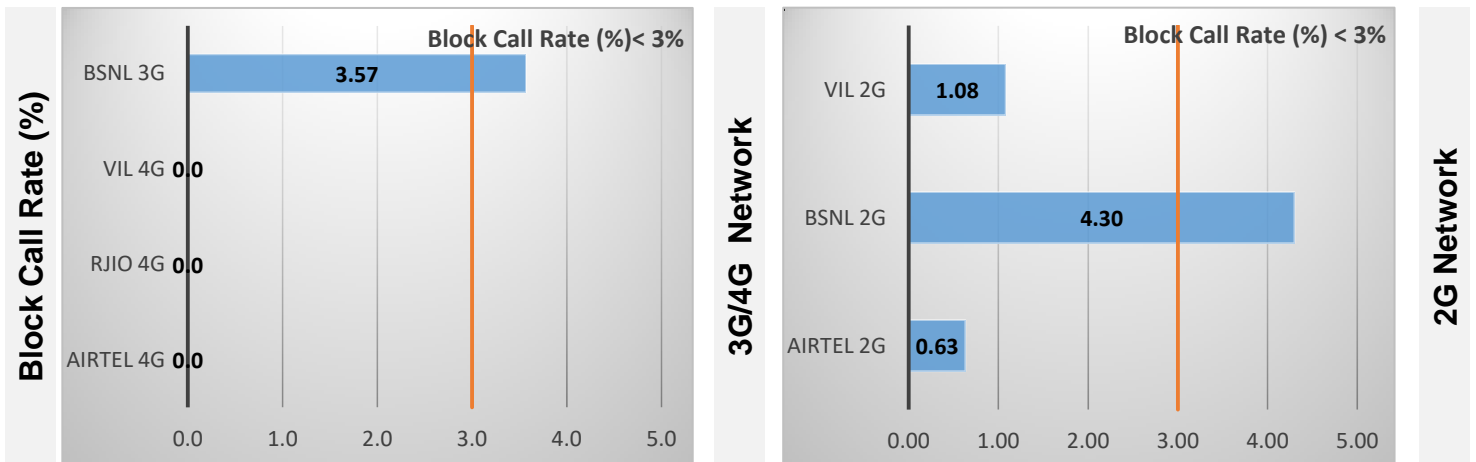
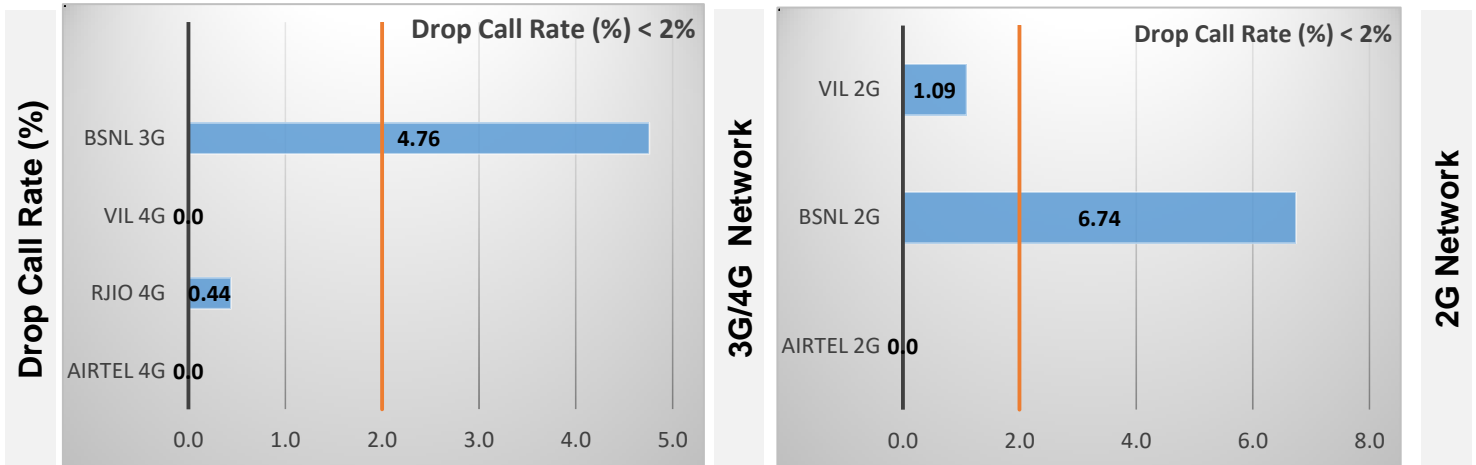
Data Service Test- Static Locations

Static Locations
Resubelpara CHC-DMHO Office
Tura Police Station
Dalugre Play ground
Dainadubi PS

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	RJO	VIL
Drop Call Rate %	0.0	6.74	1.09	4.76	0.0	0.44	0.0
Block Call Rate %	0.63	4.30	1.08	3.57	0.0	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%) except BSNL (2G) & (3G) network.

Coverage

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

TSPs	2G		
	AIRTEL	BSNL	VIL
Coverage %	68.0	59.71	59.63

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

TSPs	3G	4G		
	BSNL	AIRTEL	RJIO	VIL
Coverage	44.22	93.0	88.28	66.20

Summary

City Level Summary- Voice

Voice Call	2G		
	AIRTEL	BSNL	VIL
Call Attempt	322.0	186.0	93.0
Blocked Call Rate (%)	0.63	4.30	1.08
CSSR% (Accessibility)	99.37	95.70	98.92
Drop Call Rate (%)	0.0	6.74	1.09
Mobility HOSR (%)	100	83.78	100
Rx Quality (%)	97.0	93.36	84.44

Voice Call	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Call Attempt	112.0	327.0	460.0	21.0
Blocked Call Rate (%)	3.57	0.0	0.0	0.0
CSSR% (Accessibility)	94.0	100.0	99.78	100.0
Drop Call Rate (%)	4.76	0.0	0.44	0.0
Mobility HOSR (%)	80.0	100.0	99.16	100.0
Rx Quality (%)	84.85	90.0	93.19	74.22

Summary-Data Services Dynamic

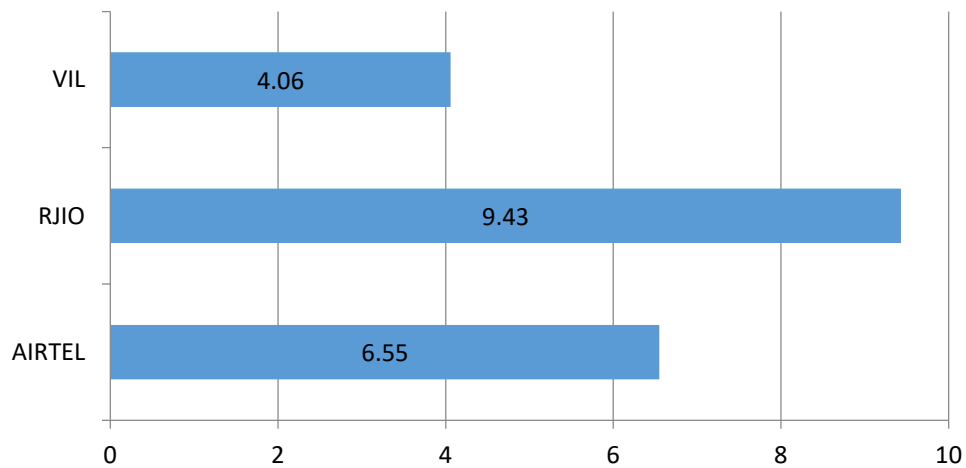
Key Observations

Dynamic Data was tested for 583 Kms. Download Throughput was tested.

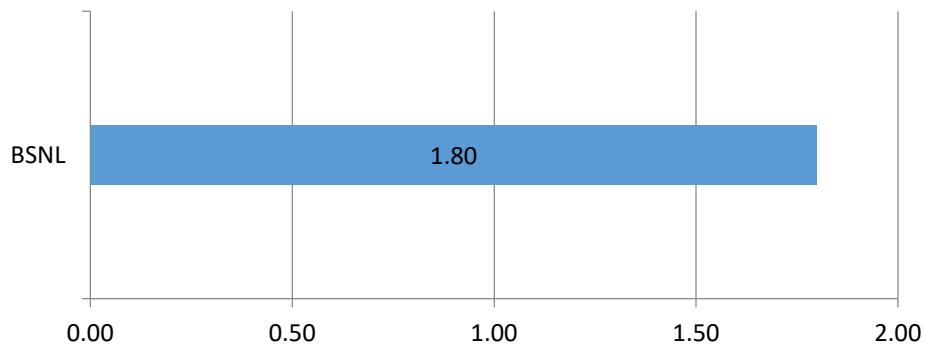
Data Download Performance (Average Throughput in Mbps) - Dynamic Data Testing

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)	78.50	82.50	104.43
Upload Throughput (kbps)	44.80	12.09	59.25
Web Browsing Delay (sec)	0.0	30.50	0.91
Latency (msec)	177	166	237

Average Data Services Static	3G/ 4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	0.91	15.26	14.96	3.70
Upload Throughput in Mbps	0.17	7.60	2.94	7.70
Video streaming delay (secs)	3.02	0.0	***	1.25
Web Browsing Delay (secs)	12.50	0.0	2.71	0.76
Latency (msec)	94	74	49.13	60

*** RJIO did not submit the report

Summary-Data Services Static

Location Level Summary-

Location:- Resubuelpara CHC-DMHO Office	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	77.30	78 .0	102.62
Upload Throughput (kbps)	39.70	11.4 0	66.3
Web Browsing Delay (sec)	0.0	30 .0	0.92
Latency (msec)	184	160	238

Location:-Resubuelpara CHC-DMHO Office	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	1.03	13.45	27.63	***
Upload Throughput in Mbps	0.19	7.20	2.16	***
Video streaming delay (secs)	2.94	0.0	***	***
Web Browsing Delay (secs)	11.50	0.0	2.45	***
Latency (msec)	92	78	36.30	***

Location:- Tura Police Station	2G		
	AIRTEL	BSNL	VIL
Download throughput in (kbps)	69.80	87.0	106.24
Upload Throughput in (kbps)	44.60	12.79	52.2
Web Browsing Delay (secs)	0.0	31.0	0.89
Latency (msec)	178	172	236

Location:- Tura Police Station	4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in (mbps)	0.79	14.30	2.94	3.70
Upload Throughput in (mbps)	0.15	6.80	0.06	7.70
Video streaming delay (secs)	3.10	0.0	***	1.24
Web Browsing Delay (secs)	13.50	0.0	3.20	0.76
Latency (msec)	96	79	65.65	60

***RJIO did not submit data

***VIL had no coverage

Summary-Data Services Static

Location Level Summary-

Location:- Daluagre Playground	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	77.80	***	***
Upload Throughput (kbps)	45.67	***	***
Web Browsing Delay (sec)	0.0	***	***
Latency (msec)	176	***	***

Location:-Daluagre Playground	3G/4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	***	15.80	15.29	***
Upload Throughput in Mbps	***	8.80	2.83	***
Video streaming delay (secs)	***	0.0	***	***
Web Browsing Delay (secs)	***	0.0	2.56	***
Latency (msec)	***	68	59.05	***

Location:- Dainadubi PS	2G		
	AIRTEL	BSNL	VIL
Download throughput in (kbps)	89.20	***	***
Upload Throughput in (kbps)	49.23	***	***
Web Browsing Delay (secs)	0.0	***	***
Latency (msec)	171	***	***

Location:- Dainadubi PS	4G			
	BSNL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in (mbps)	***	17.50	13.98	***
Upload Throughput in (mbps)	***	7.60	6.70	***
Video streaming delay (secs)	***	0.0	***	***
Web Browsing Delay (secs)	***	0.0	2.66	***
Latency (msec)	***	71	35.50	***

***RJIO did not submit data

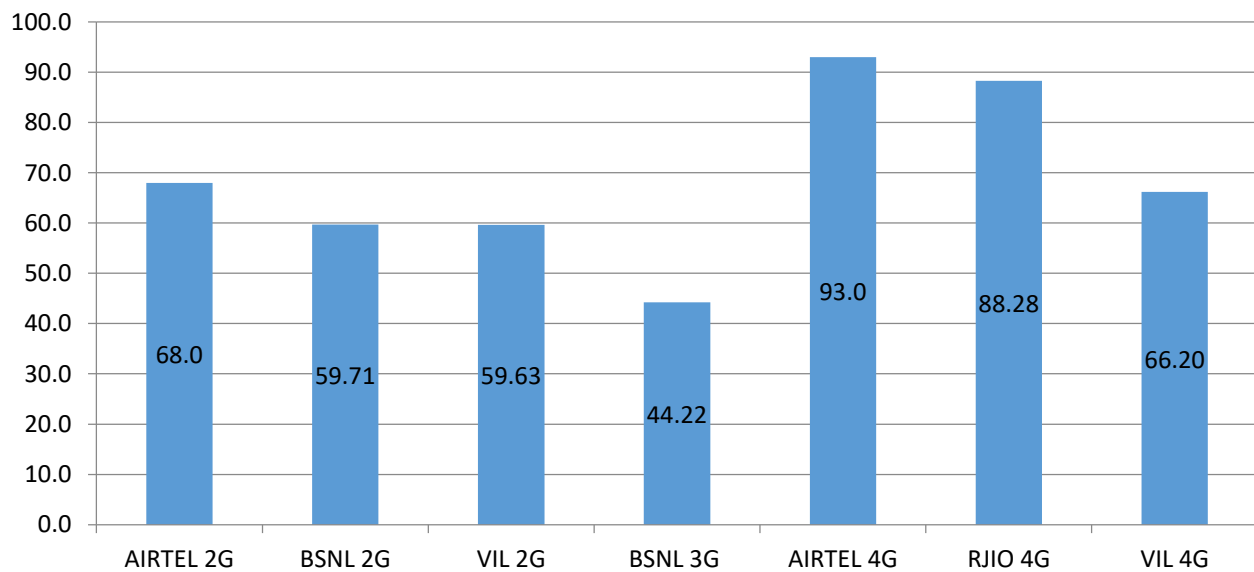
***VIL & BSNL had no coverage

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	68.0
BSNL 2G	59.71
VIL 2G	59.63
BSNL 3G	44.22
AIRTEL 4G	93.0
RJIO 4G	88.28
VIL 4G	66.20

Coverage Rate %



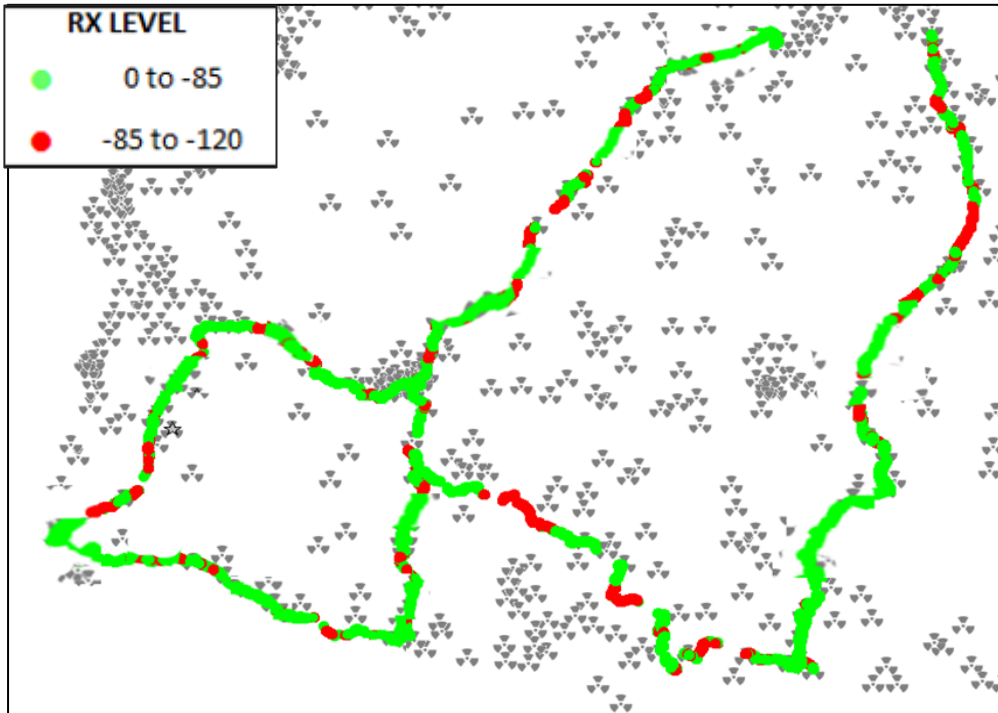
Note- Coverage is the percentage of samples having signal strength more than the threshold value (2G ≥ -85 dbm, 3G ≥ -90 dbm and 4G ≥ -110 dbm). However, these samples are only for the portion of the OADT routes where TSPs have coverage i.e 'no coverage' routes have been excluded.

I. Coverage Details

AIRTEL

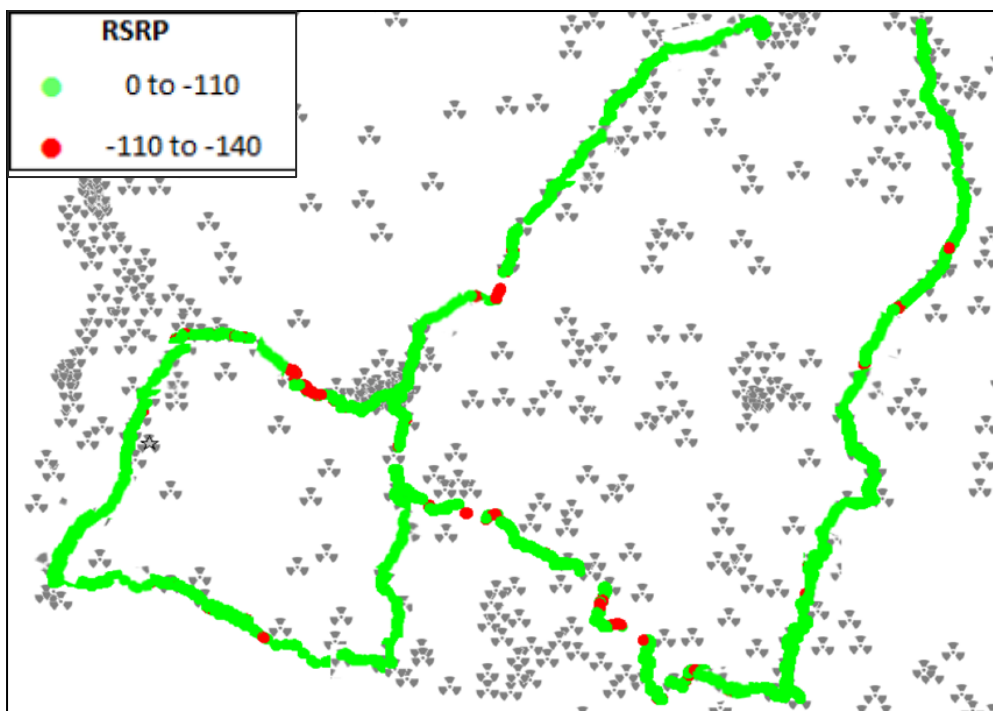
Technology	Coverage Rate %
2G	68.0
4G	93.0

2G



Overall Rx Level	Sample %
[Max >=-75]	14
[-75 >=-85)	53
[-85 >=-95)	16
[-95 >=Min)	17
Total	100

4G



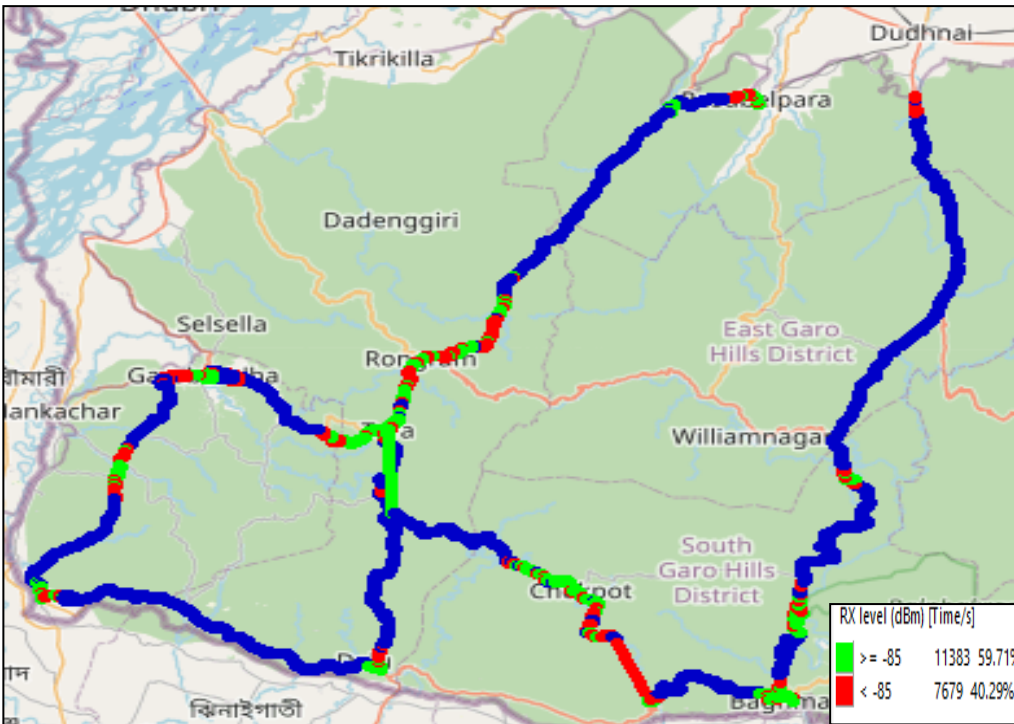
Overall RSRP	Sample %
[Max >=-80]	5
[-80 >=-90)	12
[-90 >=-110)	76
[-110 >=Min)	7
Total	100

I. Coverage Details

BSNL

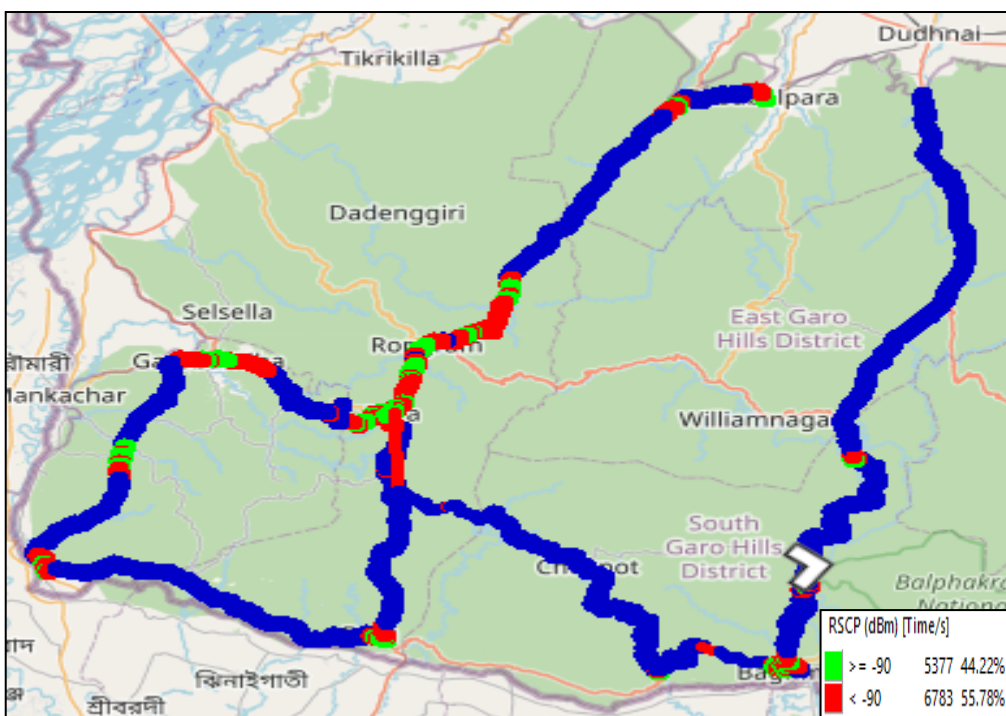
Technology	Coverage Rate %
2G	59.71
3G	44.22

2G



Overall RxLevel	Sample %
[Max >=-75]	36.73
[-75 >=-85)	22.99
[-85 >=-95)	23.09
[-95 >=Min)	17.2
Total	100

3G



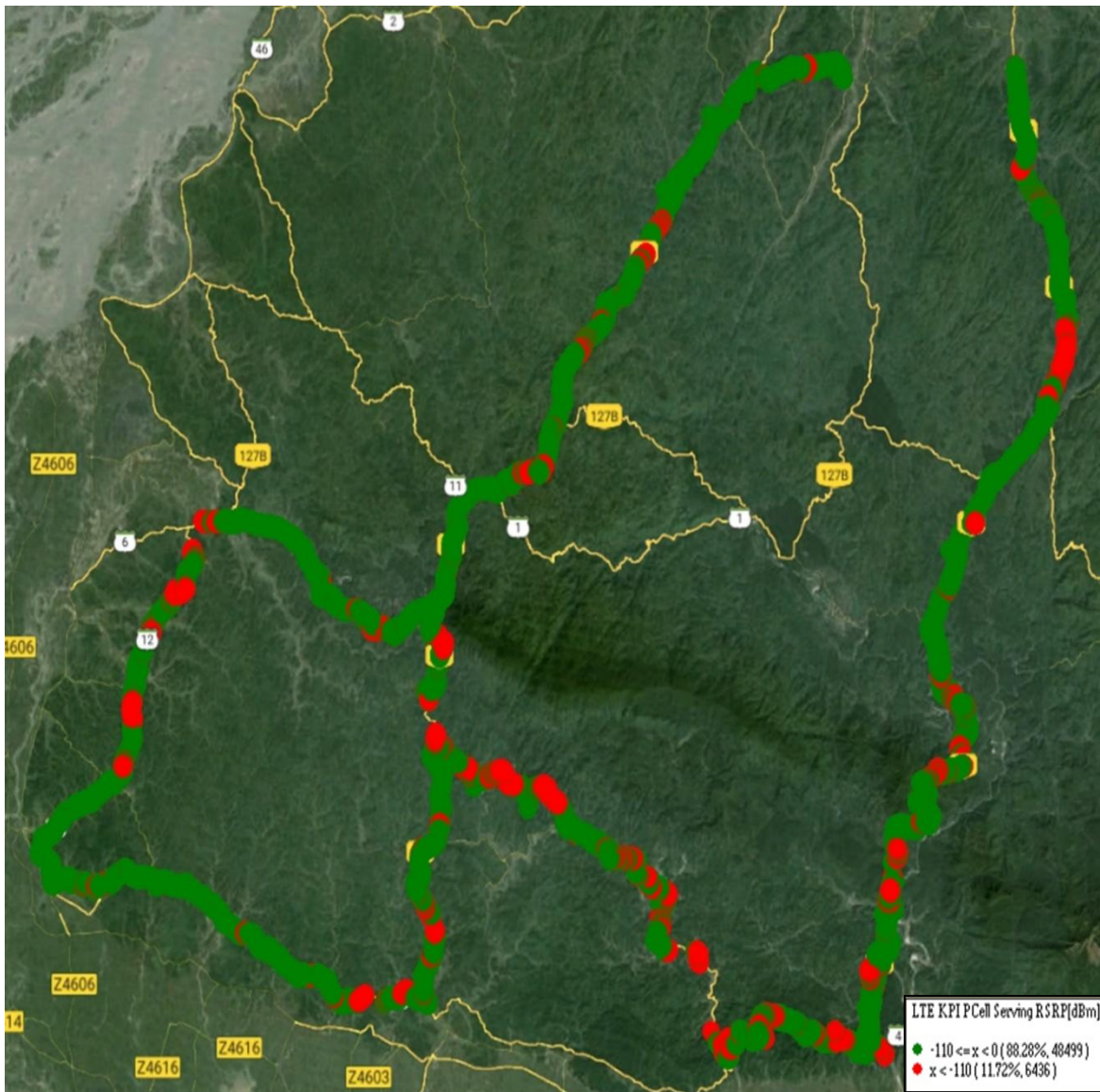
Overall RSCP	Sample %
[Max >=-70]	6.73
[-70 >=-80)	12.81
[-80 >=-90)	24.68
[-90 >=Min)	55.78
Total	100

I. Coverage Details

RJIO

Technology	Coverage Rate %
4G	88.28

4G



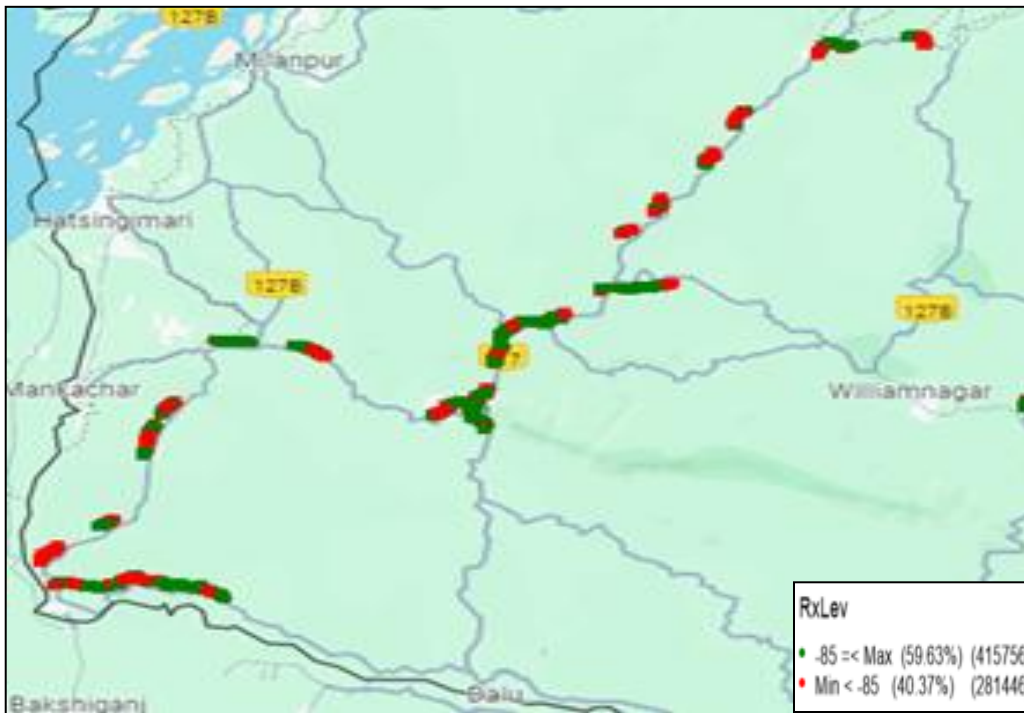
Overall RSRP	Sample %
[Max >=-80]	9.80
[-80 >=-90]	19.33
[-90 >=-110]	59.17
[-110 >=Min)	11.72
Total	100

I. Coverage Details

VIL

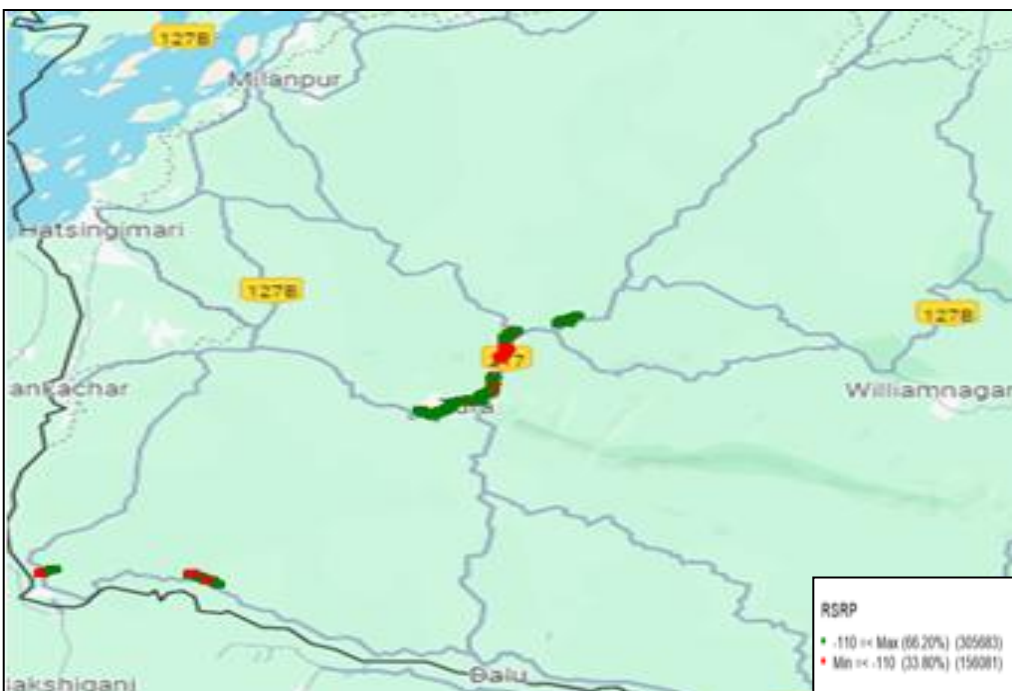
Technology	Coverage Rate %
2G	59.63
4G	66.20

2G



Overall RxLevel	Sample %
[Max >=-75]	31.16
[-75 >=-85]	28.47
[-85 >=-95]	21.21
[-95 =Min)	19.16
Total	100

4G



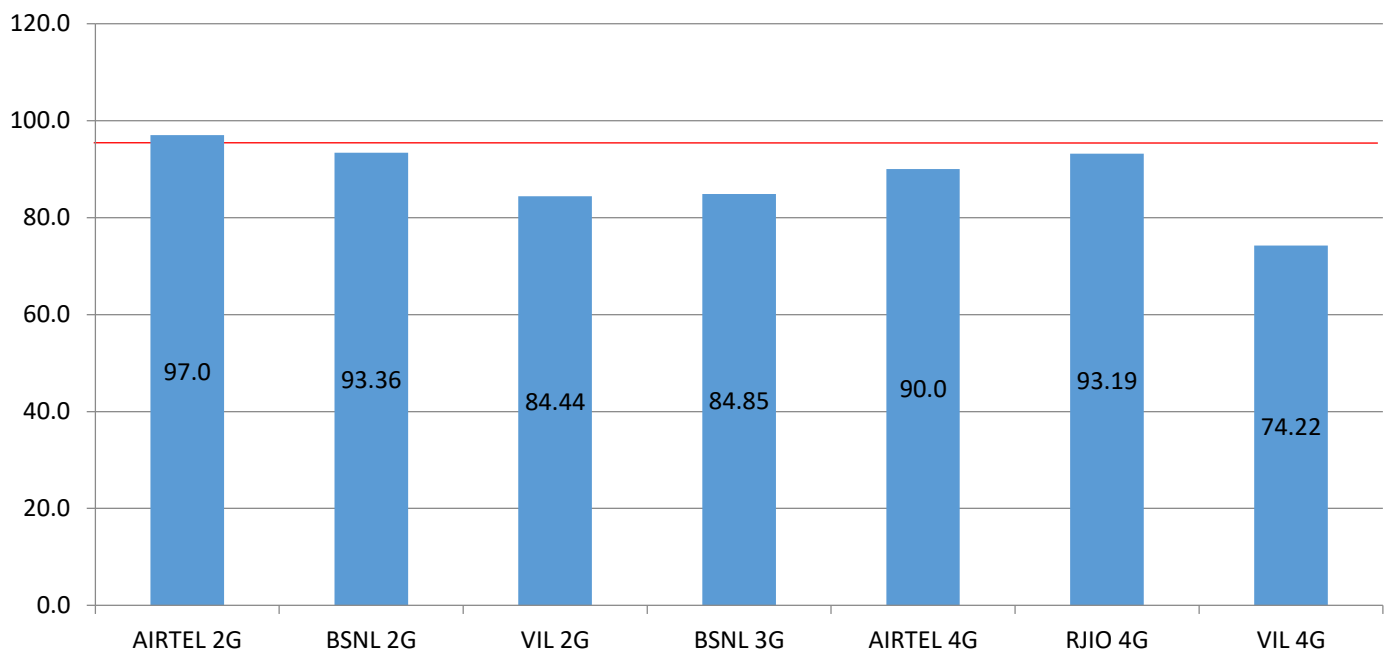
Overall RSRP	Sample %
[Max >=-80]	8.12
[-80 >=-90]	13.26
[-90 >=-110]	44.82
[-110 >=Min)	33.80
Total	100

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	97.0
BSNL 2G	93.36
VIL 2G	84.44
BSNL 3G	84.85
AIRTEL 4G	90.0
RJIO 4G	93.19
VIL 4G	74.22

Rx Quality %

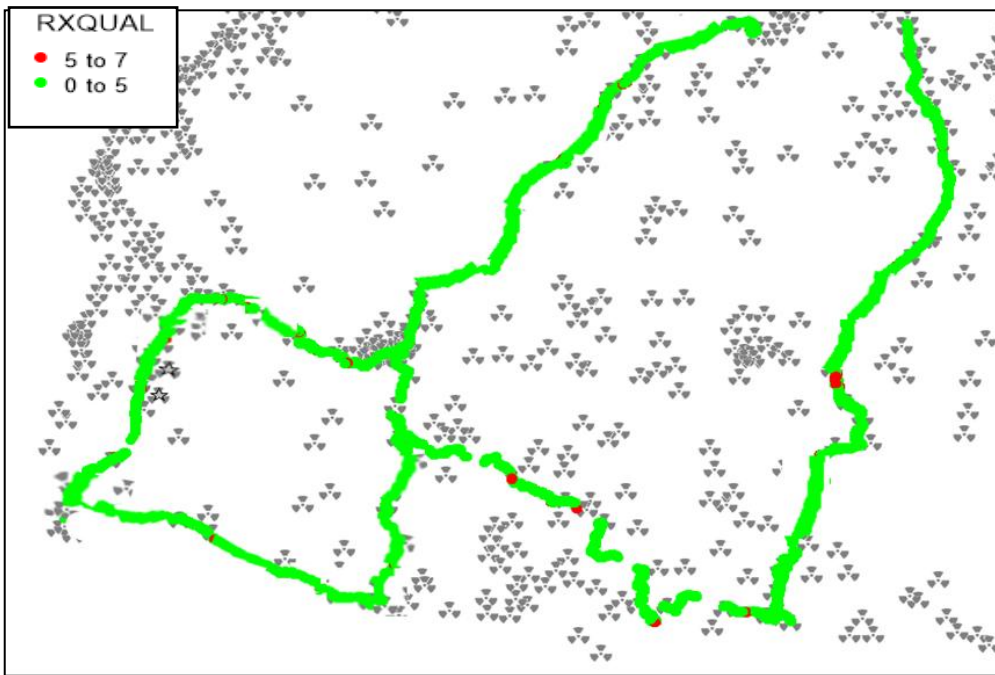


II. Quality Details

AIRTEL

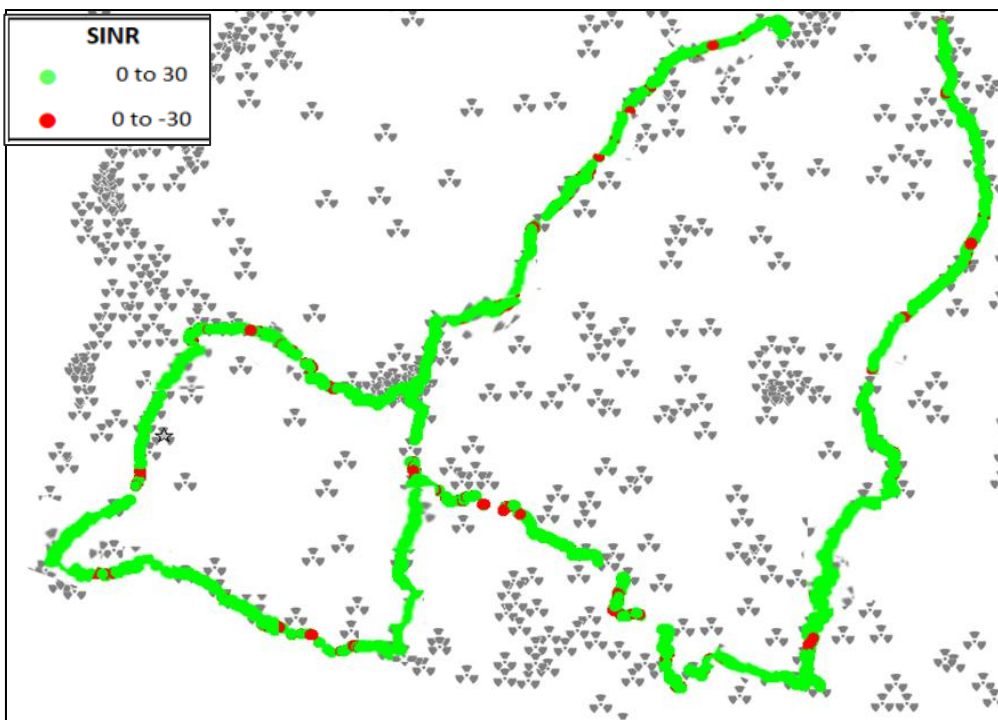
Technology	Rx Quality %
2G	97.0
4G	90.0

2G



Overall Rx Quality	Sample %
(Min <=2)	92
(2 <=3)	2
(3 <=4)	2
(4 <=5)	1
(5 <=Max)	3
Total	100

4G



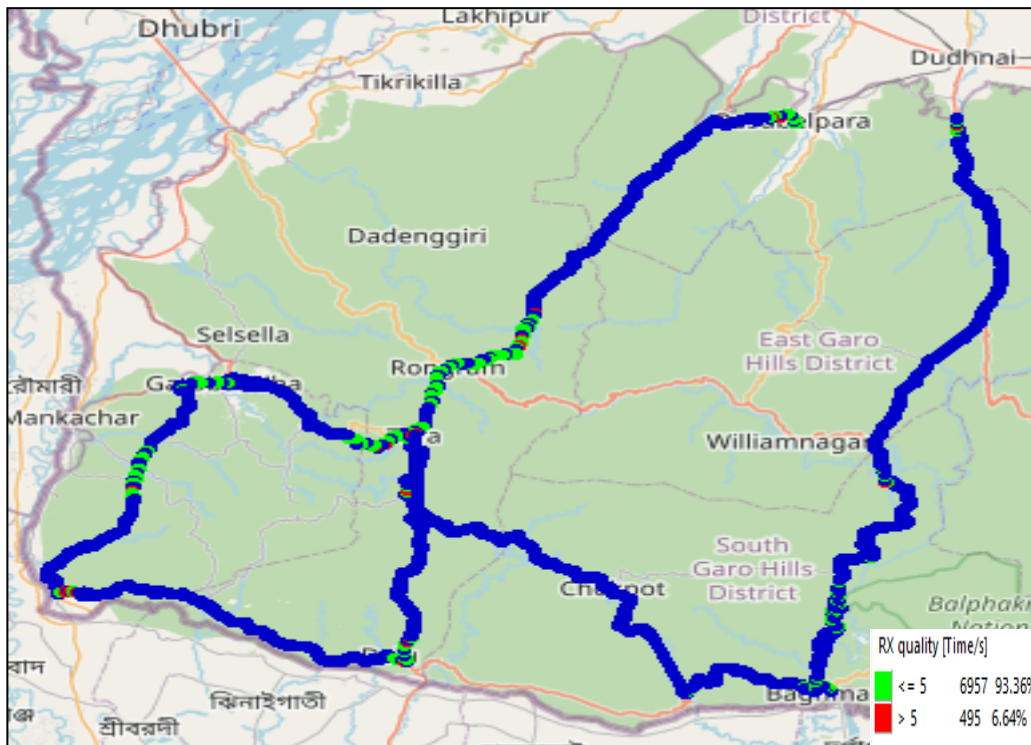
Overall SINR	Sample %
(Min <=0)	10
(0 <=5)	27
(5 <=10)	27
(10 <=15)	17
(15 <=Max)	20
Total	100

II. Quality Details

BSNL

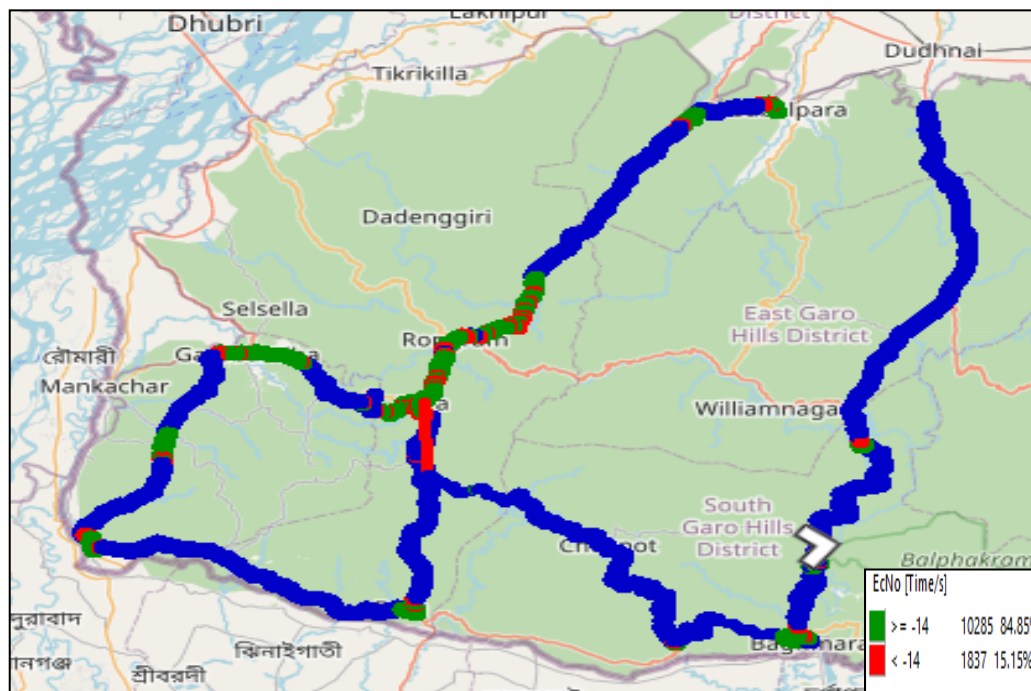
Technology	Rx Quality %
2G	93.36
3G	84.85

2G



Overall Rx Quality	Sample %
(Min ≤ 2)	87.36
(2 ≤ 3)	2.2
(3 ≤ 4)	2.11
(4 ≤ 5)	1.69
(5 \leq Max)	6.64
Total	100

3G

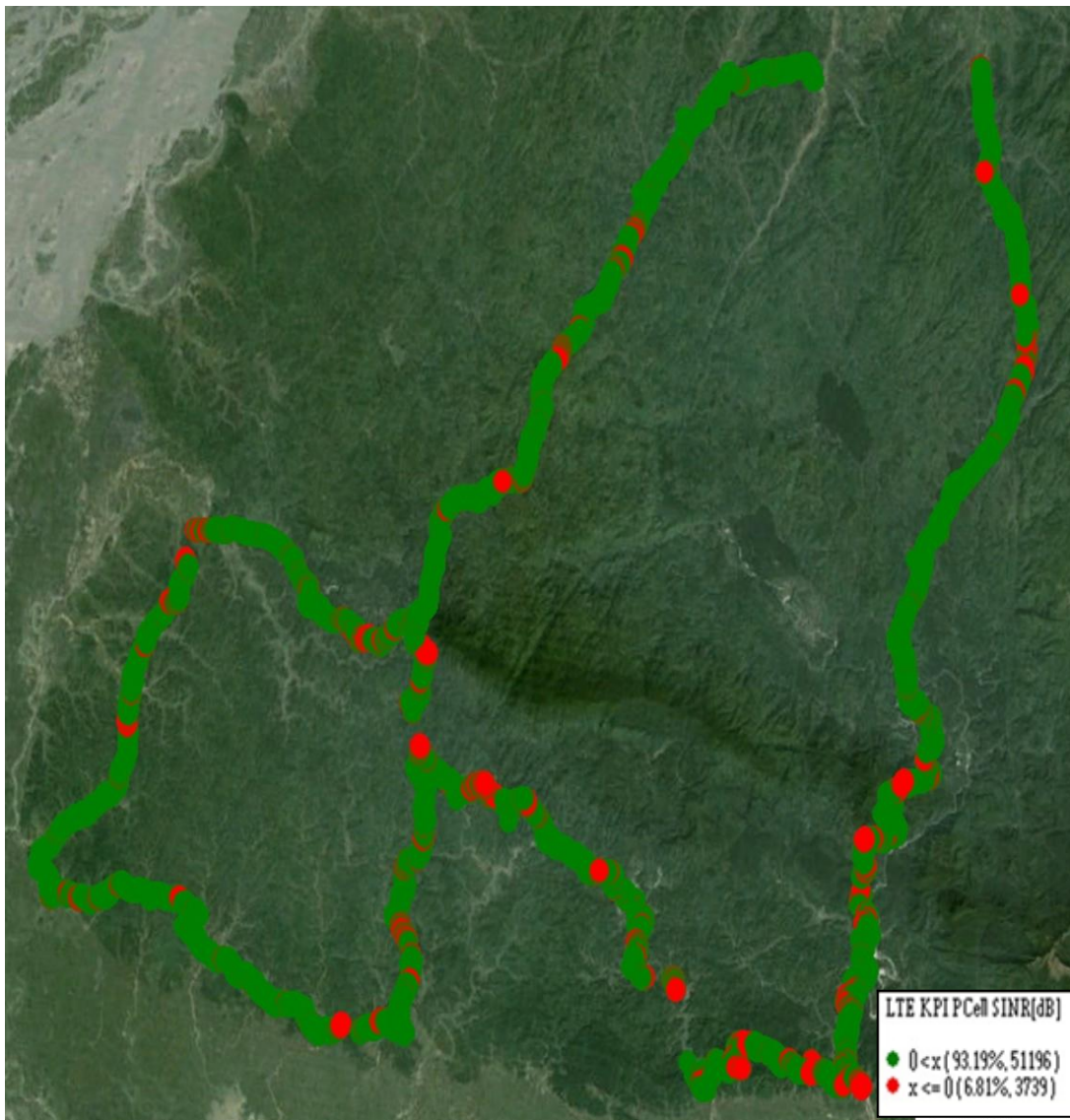


Overall EcNo	Sample %
(Max ≤ -6)	32.32
(-6 ≤ -9)	20.67
(-9 ≤ -11)	18.21
(-11 ≤ -14)	13.64
(-14 \leq Min)	15.15
Total	100

II. Quality Details

RJIO

Technology	Rx Quality %
4G	93.19
4G	



Overall SINR	Sample %
(Min <=0)	6.81
(0 <=5)	23.79
(5 <=10)	19.77
(10 <=15)	19.53
(15 <=Max)	30.11
Total	100

II. Quality Details

VIL

Technology	Rx Quality %
2G	84.44
4G	74.22

2G



Overall Rx Quality	Sample %
(Min <=2)	77.56
(2 <=3)	1.56
(3 <=4)	2.62
(4 <=5)	2.70
(5 <=Max)	15.56
Total	100

4G



Overall SINR	Sample %
(Min <=0)	25.78
(0 <=5)	14.48
(5 <=10)	17.48
(10 <=15)	24.47
(15 <=Max)	17.79
Total	100

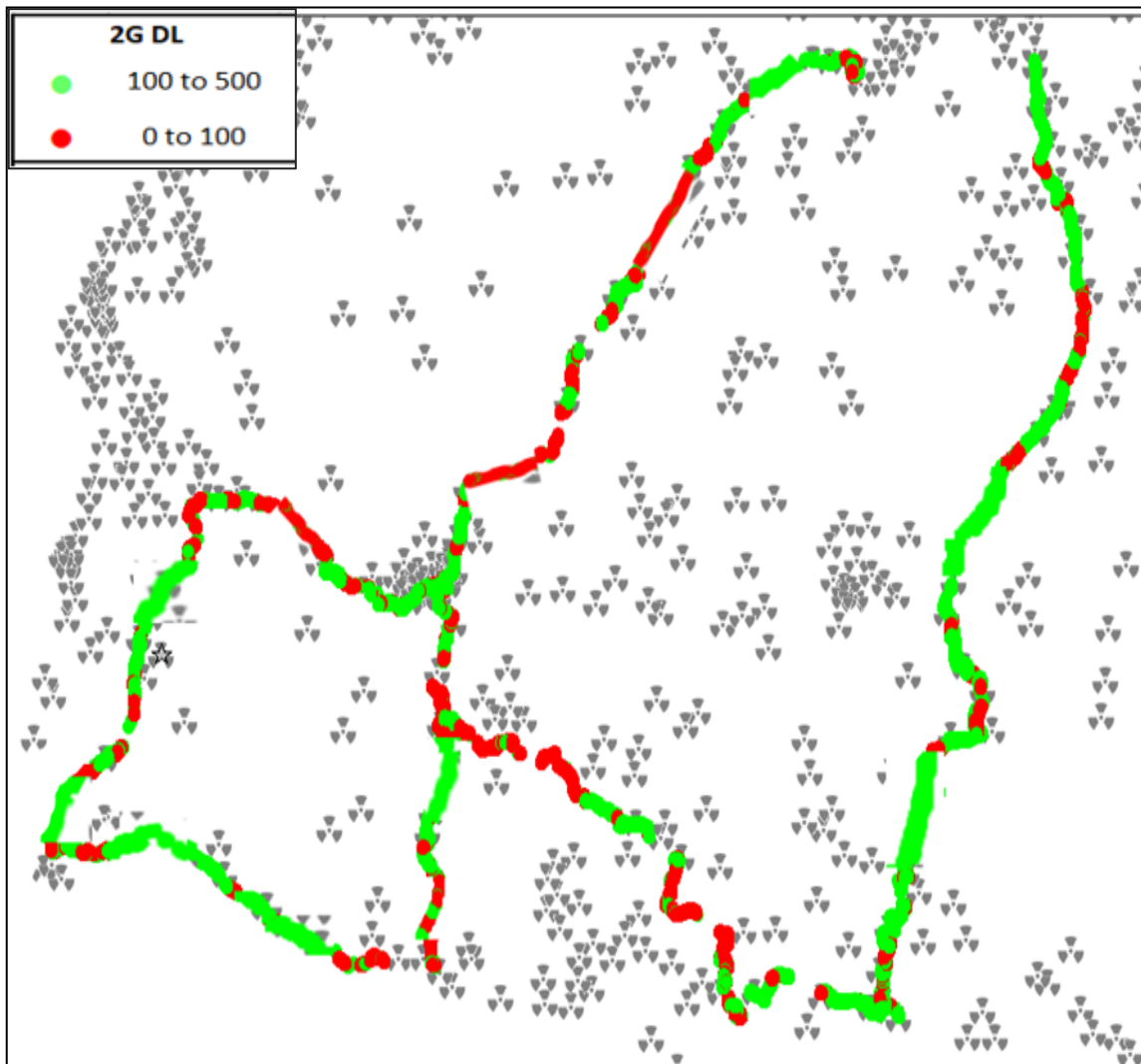
IV. Dynamic Data Test- 2G DL Details

AIRTEL

Dynamic Data Testing Complete 583 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	60.50

2G



AVG. DOWNLOAD SPEED (Kbps)	60.50
% FILE TRANSFER COMPLETE	55.47
DL throughput	Sample %
0 to 50 Kbps	30
50 to 100 Kbps	11
100 to 200 Kbps	59
200 to 300 Kbps	0.49
>300 Kbps	0.01
Total	100

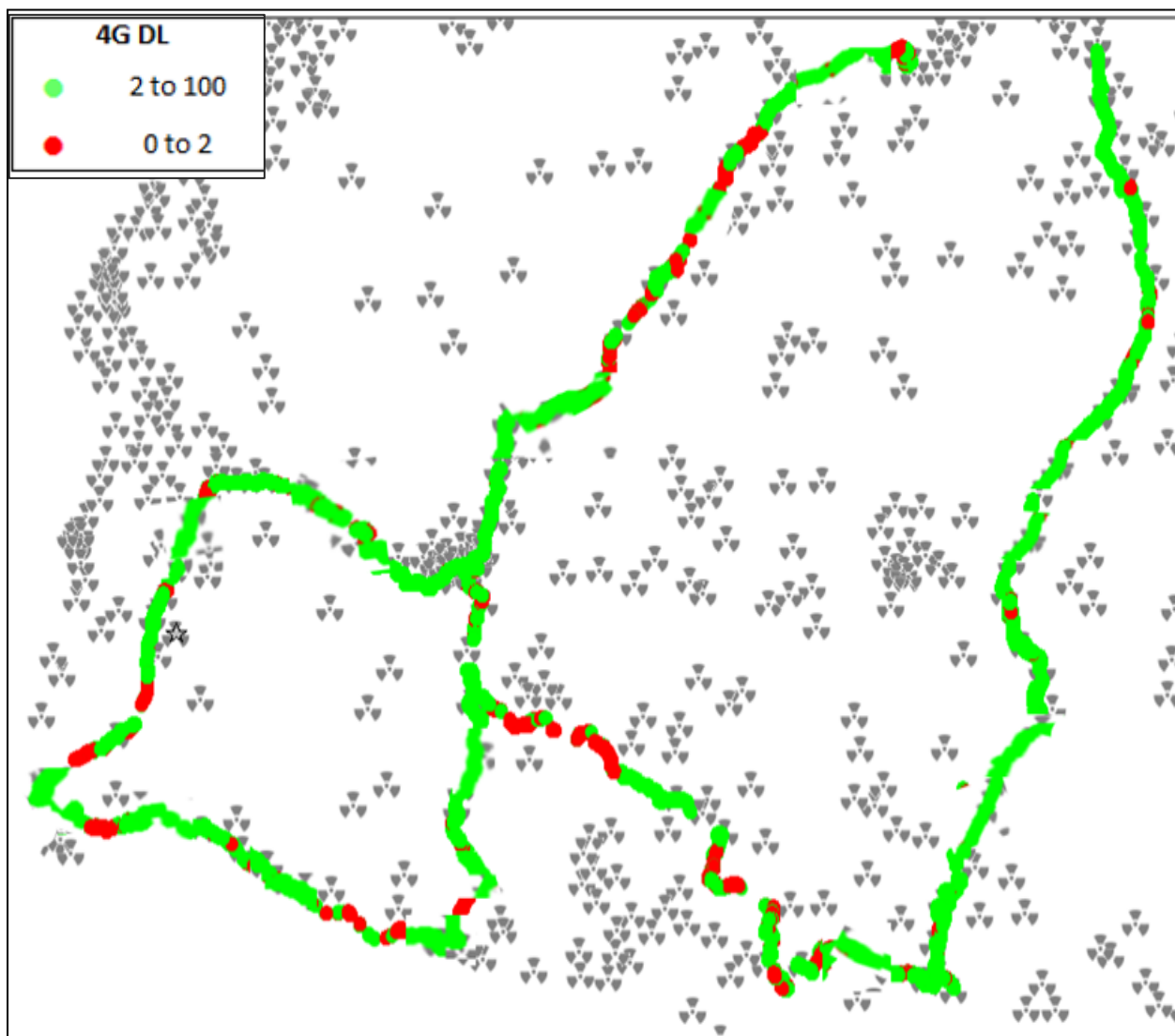
IV. Dynamic Data Test- 4G DL Details

AIRTEL

Dynamic Data Testing Complete 583 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	6.55

4G



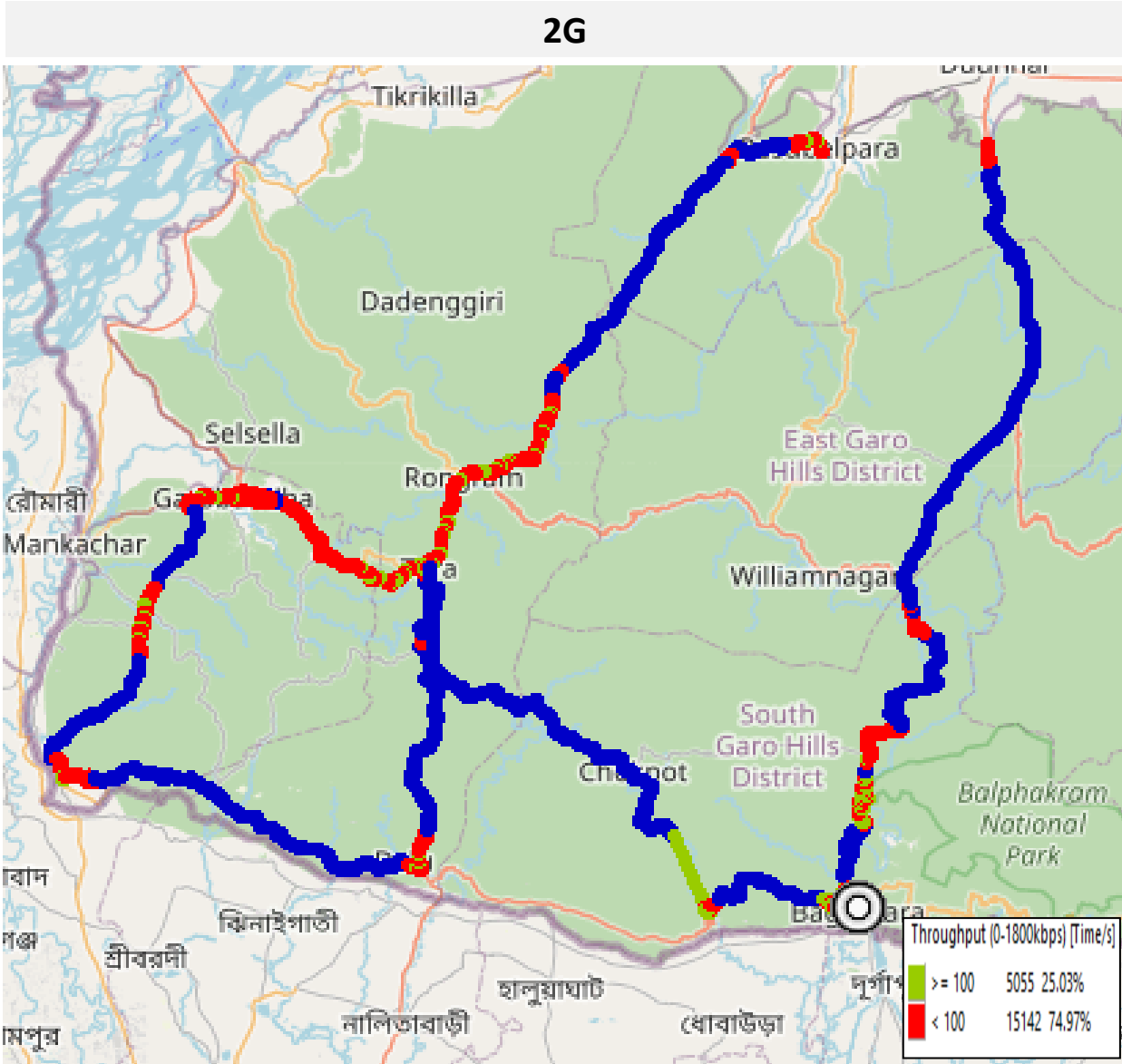
AVG. DOWNLOAD SPEED (Mbps)	6.55
% FILE TRANSFER COMPLETE	74.38
DL throughput	Sample %
0 to 1 Mbps	8.4
1 to 2 Mbps	13.6
2 to 5 Mbps	16.2
5 to 10 Mbps	39.4
>10 Mbps	22.5
Total	100

IV. Dynamic Data Test- 2G DL Details

BSNL

Dynamic Data Testing Complete 583 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	173.0



AVG. DOWNLOAD SPEED (Kbps)	173.0
% FILE TRANSFER COMPLETE	94.11
DL throughput	Sample %
0 to 50 Kbps	74.97
50 to 100 Kbps	0
100 to 200 Kbps	0.03
200 to 300 Kbps	24.74
>300 Kbps	0.26
Total	100

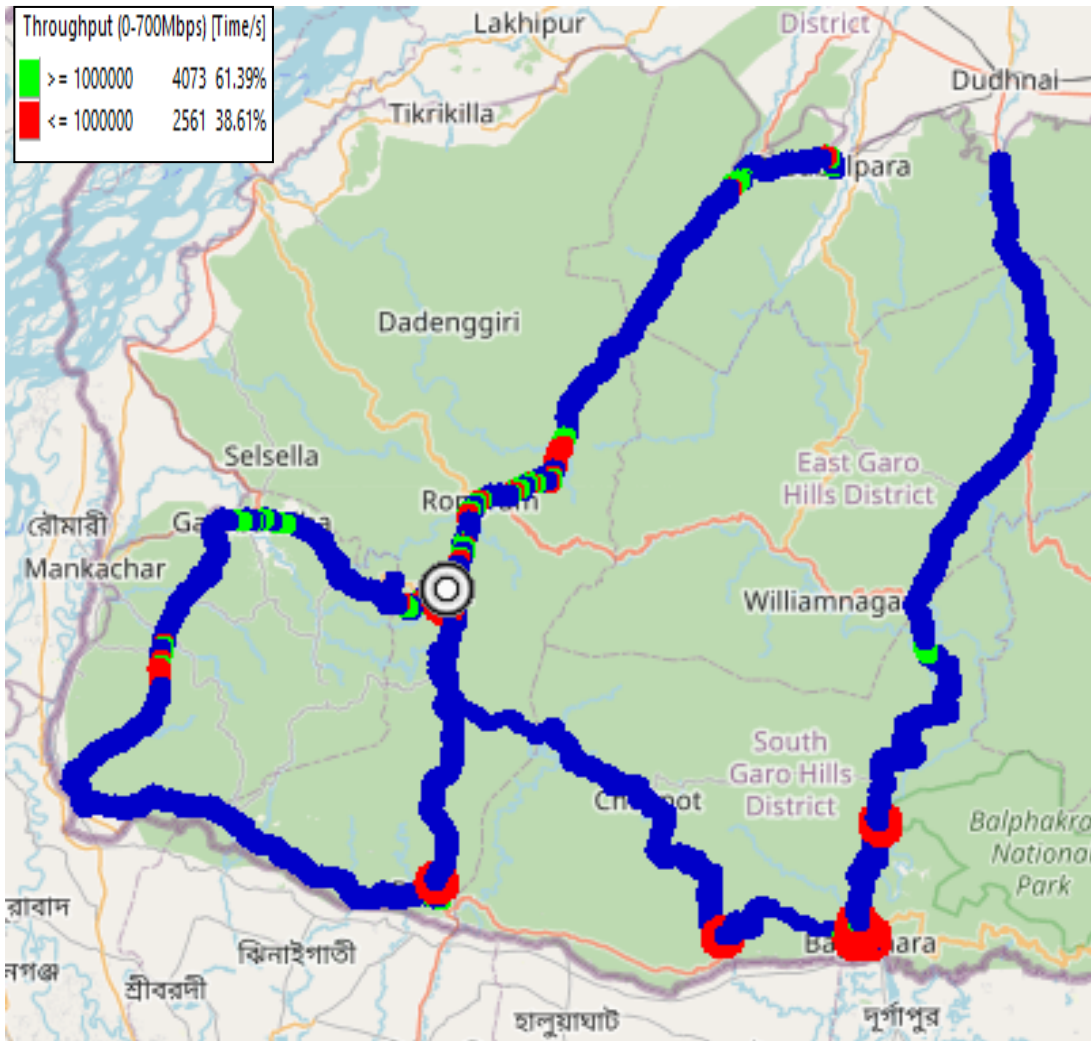
IV. Dynamic Data Test- 3G DL Details

BSNL

Dynamic Data Testing Complete 583 Kms

Data KPIs - Overall	3G
Average Download Throughput (Mbps)	1.80

3G



AVG. DOWNLOAD SPEED (Mbps)	1.80
% FILE TRANSFER COMPLETE	78.18
DL throughput	Sample %
0 to 0.5 Mbps	27.62
0.5 to 1 Mbps	10.99
1 to 2 Mbps	44.69
2 to 5 Mbps	16.14
>5 Mbps	0.56
Total	100

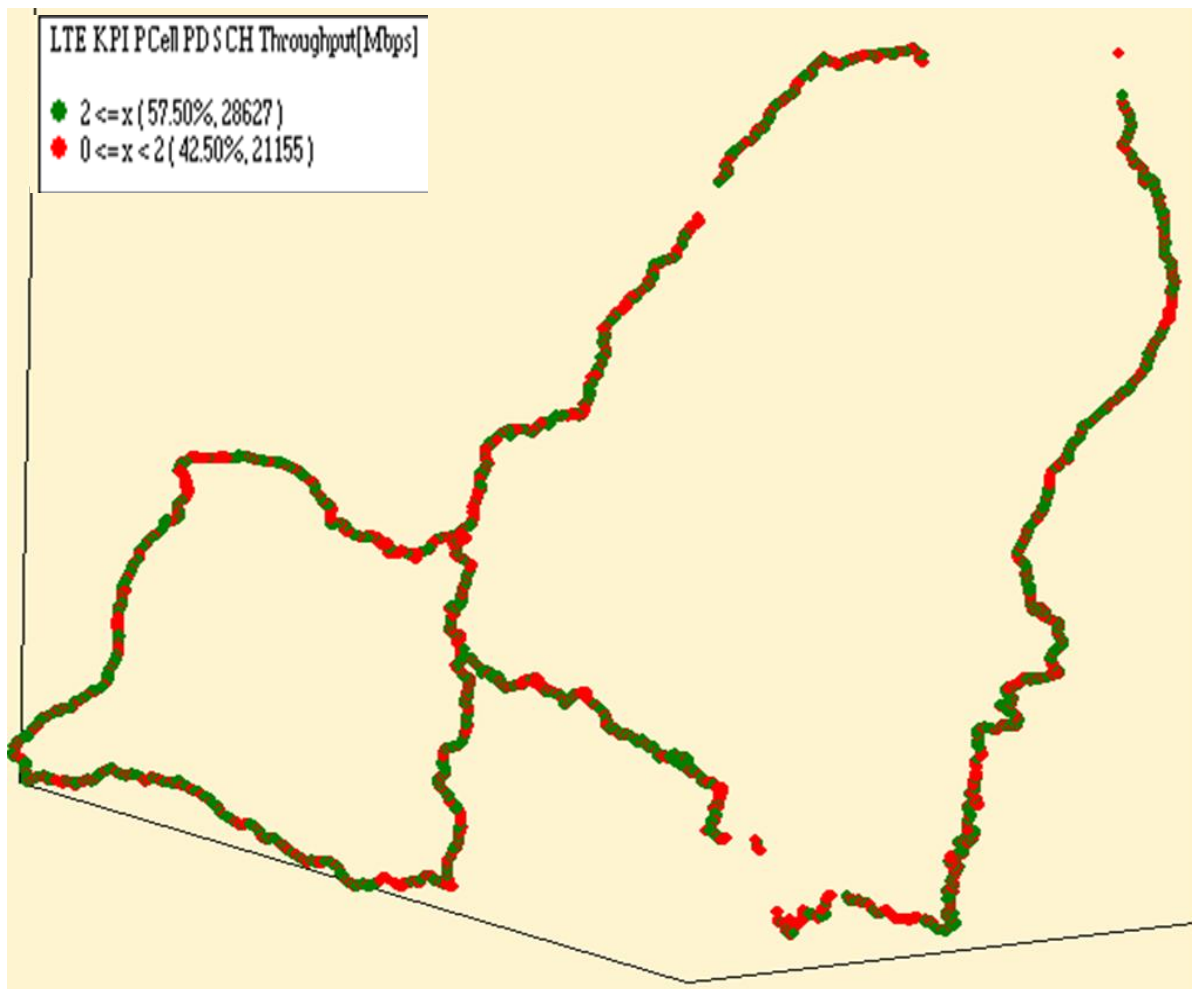
IV. Dynamic Data Test- 4G DL Details

RJIO

Dynamic Data Testing Complete 583 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	9.43

4G



AVG. DOWNLOAD SPEED (Mbps)	9.43
% FILE TRANSFER COMPLETE	100
DL throughput	Sample %
0 to 1 Mbps	31.44
1 to 2 Mbps	11.08
2 to 5 Mbps	20.82
5 to 10 Mbps	15.26
>10 Mbps	21.41
Total	100

IV. Dynamic Data Test-2G DL Details

VIL

Dynamic Data Testing Complete 583 Kms

Data KPIs – Overall	2G
Average Download Throughput (Kbps)	68.72

2G



AVG. DOWNLOAD SPEED (Kbps)	68.72
% FILE TRANSFER COMPLETE	93.94
DL throughput	Sample %
0 to 50 Kbps	16.49
50 to 100 Kbps	28.32
100 to 200 Kbps	22.24
200 to 300 Kbps	17.99
>300 Kbps	14.96
Total	100

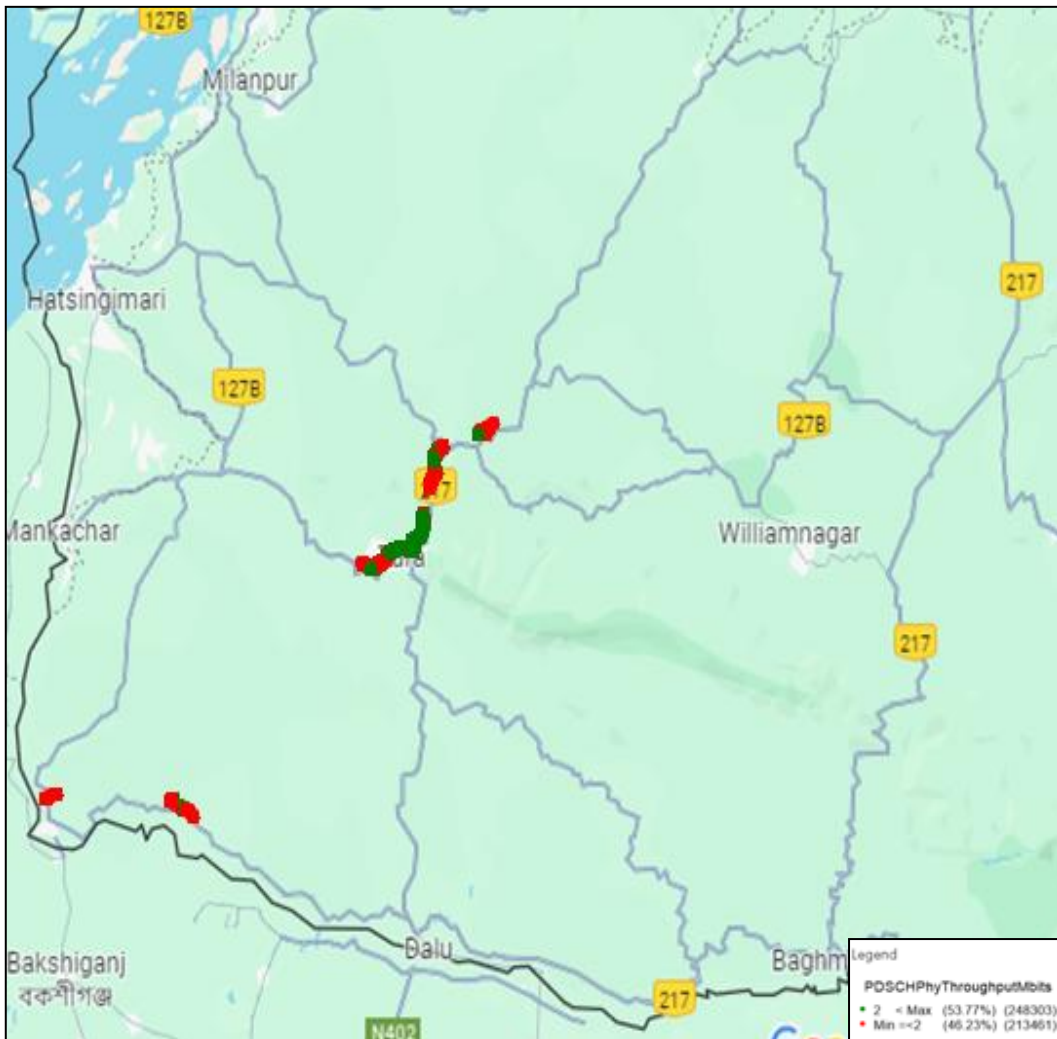
IV. Dynamic Data Test- 4G DL Details

VIL

Dynamic Data Testing Complete 583 Kms

Data KPIs – Overall	4G
Average Download Throughput (Mbps)	4.06

4G



AVG. DOWNLOAD SPEED (Mbps)	4.06
% FILE TRANSFER COMPLETE	97.85
DL throughput	Sample %
0 to 1 Mbps	4.94
1 to 2 Mbps	41.28
2 to 5 Mbps	13.76
5 to 10 Mbps	10.58
>10 Mbps	29.44
Total	100