

# Operator Assisted Drive Test Report

## Agartala, Tripura

### April, 2023

### (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**-Rx Quality in 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 Agartala and surrounding areas including National Highway (8) on 21<sup>st</sup> April 2023 and 22<sup>nd</sup> April 2023 from 08.30 AM to 08.30 PM. The drive test covered drive route of 324 KMs over a period of 2 days. Approximately 348+ calls were made for each of the 8 networks: three 2G networks, two 3G networks and three 4G networks covering four TSPs.

Overview

Voice  
Summary

Data  
Summary

# Overview

**Agartala** is the capital and the largest city of the Indian state of Tripura, situated on the banks of Hoara River, about 2 kilometres (1.2 mi) east of the border with Bangladesh. Agartala is the third-most populous city in Northeast 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, Two 3G networks, 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, Two 3G (Lock Mode) networks, 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	YES
4G	YES	NO	YES	YES
TOOL USED	TEMS	NIMO	X-CAL	TEMS

# Overview

## Voice & Dynamic Data Test Drive Route



### Drive Routes: Agartala

**DAY-1**—Hotel Sonar Tari-Hotel Ginger-Hotel Polo Tower's-Agartala Airport-PTC-Gandhigram- Oxygen Park-Rubber Board-Chanmari-Cancer hospital-Agartala Govt.Medical College, ITI Road-Joyguru-Mathchowmoni-College road-BBMC College-Jogendranagar-Bypass Amtoli-Railway Station-Tripura University-Aswani market-Tripura Medical College-Science City-Agartala check post-Alpona Gram-Heritage Park-Secretariat-Khayerpur Bypass- Banikya-Chowmoni-Kayespur-Ranir Bazar-NIT Road-NIT- Jirania-Mohanpur-Ranir Bazar-Kashipur-Jail Ashram road-Sonartori.

**DAY-2**-Agartala Railway Station-Madhuban-Prabhapur-Gabardi-Takarjala-Jampuijala SDM Office-Kandraichhara-Gongrai-Dhwajnagar-Udaipur Science Centre-Kakraban-Melaghar hospital-Sonamura Police Station-Kulubari-Matinagar-Kalam Chowra-Boxanagar Community Health Centre-Durganagar Bhadrabati High School-Bishalgarh Police Station-Sepahijala zoo--Sepahijala District Hospital-Bikramnagar-Kamalghat-ICFAI University, Tripura.

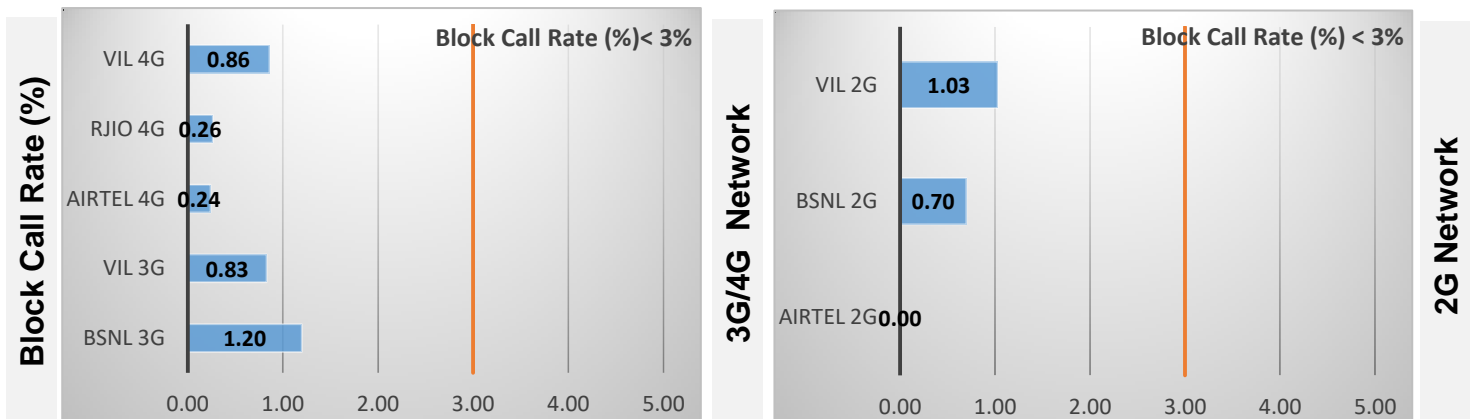
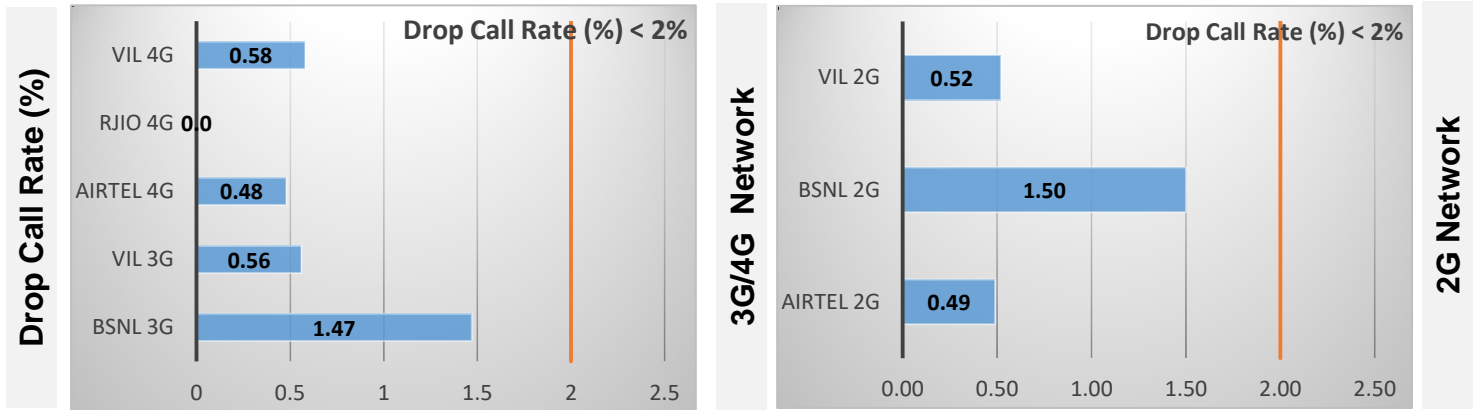
## Data Service Test- Static Locations

Static Locations
Hotel Soner Tari
Agartala Rajbari

# 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	VIL	AIRTEL	RJIO	VIL
Drop Call Rate %	0.49	1.50	0.52	1.47	0.56	0.48	0.0	0.58
Block Call Rate %	0.0	0.70	1.03	1.20	0.83	0.24	0.26	0.86

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%).
- 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 %	82.67	80.0	94.62

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

TSPs	3G		4G		
	BSNL	VIL	AIRTEL	RJIO	VIL
Coverage	70.0	95.18	99.65	91.52	86.24

# Summary

## City Level Summary- Voice

Voice Call	2G		
	AIRTEL	BSNL	VIL
Call Attempt	409	455	390
Blocked Call Rate (%)	0.0	0.70	1.03
CSSR% (Accessibility)	100	99.30	98.97
Drop Call Rate (%)	0.49	1.50	0.52
Mobility HOSR (%)	99.80	97.60	98.99
Rx Quality (%)	96.70	96.0	96.52

Voice Call	3G/4G				
	BSNL 3G	VIL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Call Attempt	412	362	414	382	348
Blocked Call Rate (%)	1.20	0.83	0.24	0.26	0.86
CSSR% (Accessibility)	98.78	99.45	99.76	99.74	99.14
Drop Call Rate (%)	1.47	0.56	0.48	0.0	0.58
Mobility HOSR (%)	95.92	100	100	99.24	100
Rx Quality (%)	91.0	97.08	88.20	89.10	84.16

# Summary-Data Services Dynamic

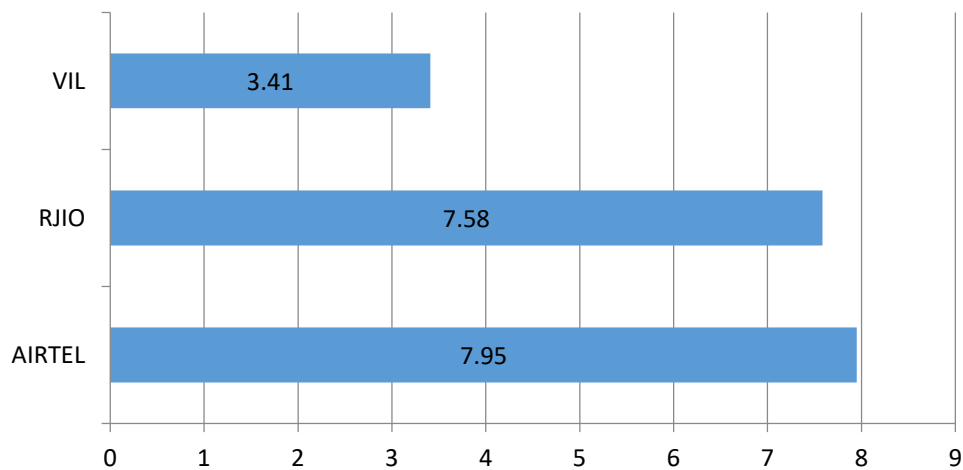
## Key Observations

Dynamic Data was tested for 324 Kms. Download Throughput was tested.

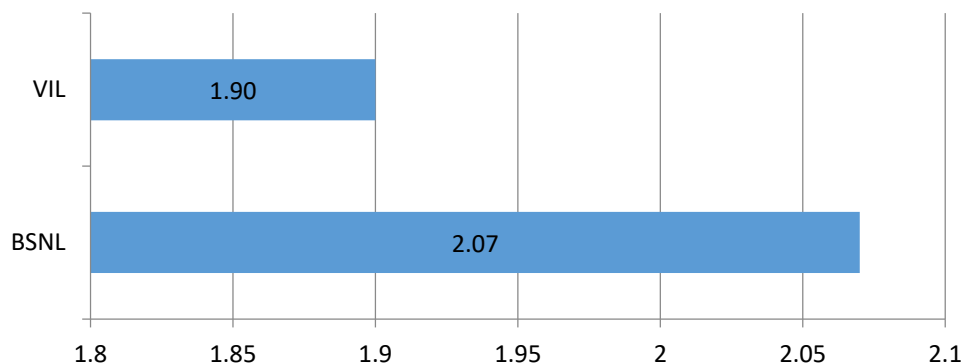
### Data Download Performance (Average Throughput in Mbps) - Dynamic Data Testing

#### 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)	62.85	224.70	104.43
Upload Throughput (kbps)	47.0	87.82	59.25
Web Browsing Delay (sec)	0.0	31.62	0.90
Latency (msec)	180	315.21	237

Average Data Services Static	3G/ 4G				
	BSNL 3G	VIL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	6.47	3.27	14.90	17.37	27.76
Upload Throughput in Mbps	2.50	1.52	7.05	***	9.79
Video streaming delay (secs)	1.49	1.82	0.0	0.0	0.52
Web Browsing Delay (secs)	14.87	1.48	0.0	3.90	0.27
Latency (msec)	77.03	144	74	51.50	90.5

\*\*\* Report not submitted



# Summary-Data Services Static

## Location Level Summary-

Location:-Hotel Soner Tari	2G		
	AIRTEL	BSNL	VIL
Download Throughput (kbps)	64.30	160.50	102.62
Upload Throughput (kbps)	48.0	143.3	66.30
Web Browsing Delay (sec)	0.0	21.53	0.92
Latency (msec)	178	221.30	238

Location:-Hotel Soner Tari	3G/4G				
	BSNL 3G	VIL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in Mbps	7.52	2.53	15.60	15.33	24.42
Upload Throughput in Mbps	1.78	1.08	6.70	***	8.84
Video streaming delay (secs)	1.27	1.82	0.0	0.0	0.49
Web Browsing Delay (secs)	1.04	1.53	0.0	3.94	0.26
Latency (msec)	251.3	132	71	48	92

\*\*\* Report not submitted

Location:- Agartala Rajbari	2G		
	AIRTEL	BSNL	VIL
Download throughput in(kbps)	61.40	200.40	106.24
Upload Throughput in (kbps)	46.0	151.15	52.20
Web Browsing Delay (secs)	0.0	17.74	0.89
Latency (msec)	182	269.7	236

Location:- Agartala Rajbari	4G				
	BSNL 3G	VIL 3G	AIRTEL 4G	RJIO 4G	VIL 4G
Download throughput in (mbps)	9.42	4.18	14.20	19.41	32.44
Upload Throughput in (mbps)	2.07	2.04	7.40	***	11.21
Video streaming delay (secs)	1.18	1.82	0.0	0.0	0.56
Web Browsing Delay (secs)	0.73	1.43	0.0	3.85	0.28
Latency (msec)	90.1	157	77	55	89

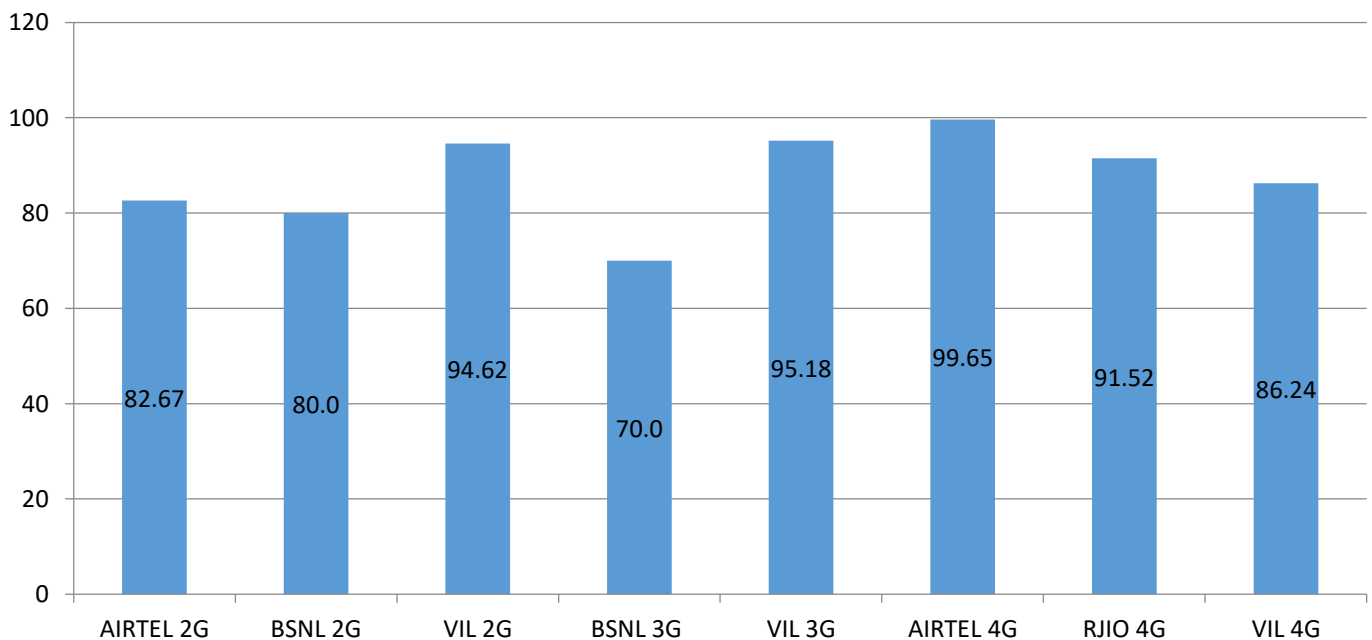
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# I. Coverage Details

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  $\geq -85$  dBm, RSCP is  $\geq -90$  dBm & RSRP  $\geq -110$ dBm. The details are as follows.

TSP	Coverage Rate %
AIRTEL 2G	82.67
BSNL 2G	80.0
VIL 2G	94.62
BSNL 3G	70.0
VIL 3G	95.18
AIRTEL 4G	99.65
RJIO 4G	91.52
VIL 4G	86.24

**Coverage Rate %**



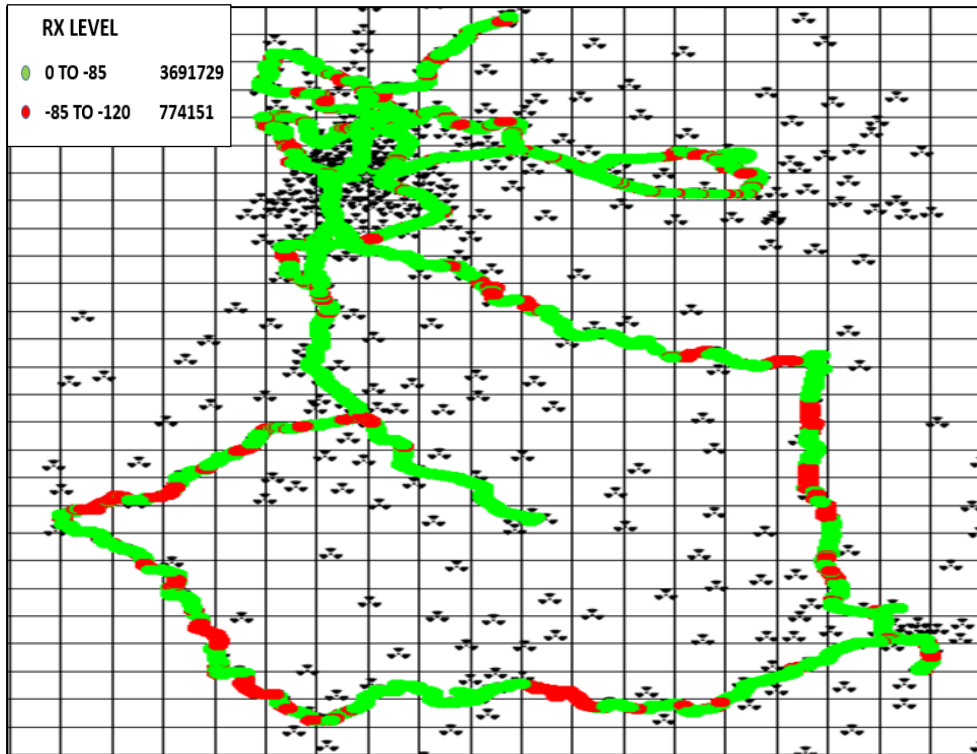
**Note- Coverage** is the percentage of samples having signal strength more than the threshold value ( 2G  $\geq -85$  dbm, 3G $\geq -90$  dbm and 4G  $\geq -110$  dbm). However, these samples are only for the portion of the OADT routes where TSPs have coverage i.e 'no coverage' routes have been excluded.

# I. Coverage Details

## AIRTEL

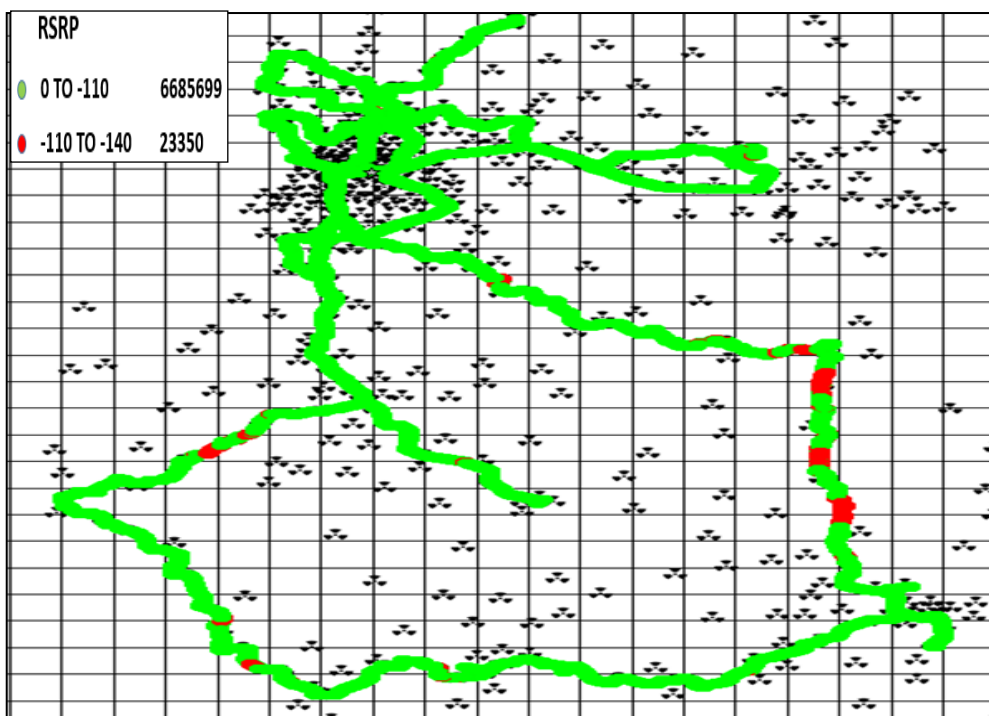
Technology	Coverage Rate %
2G	82.67
4G	99.65

### 2G



Overall Rx Level	Sample %
[Max >=-75]	47.7
[-75 >=-85]	35.0
[-85 >=-95]	12.4
[-95 >=Min]	4.9
<b>Total</b>	<b>100</b>

### 4G



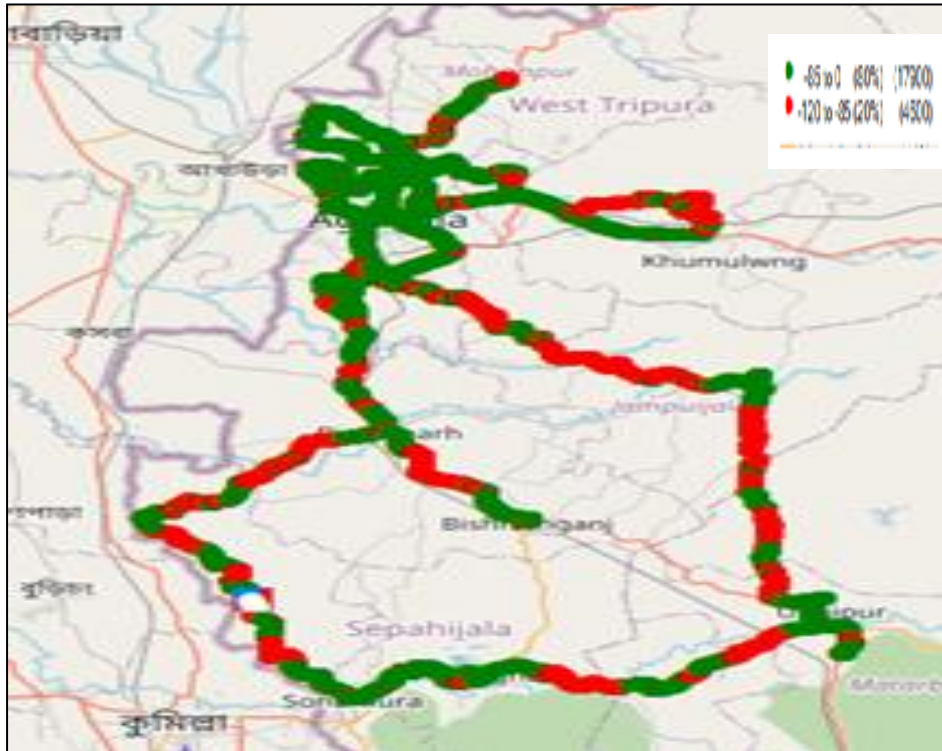
Overall RSRP	Sample %
[Max >=-80]	30.3
[-80 >=-90]	32.2
[-90 >=-110]	34.8
[-110 >=Min]	2.7
<b>Total</b>	<b>100</b>

# I. Coverage Details

## BSNL

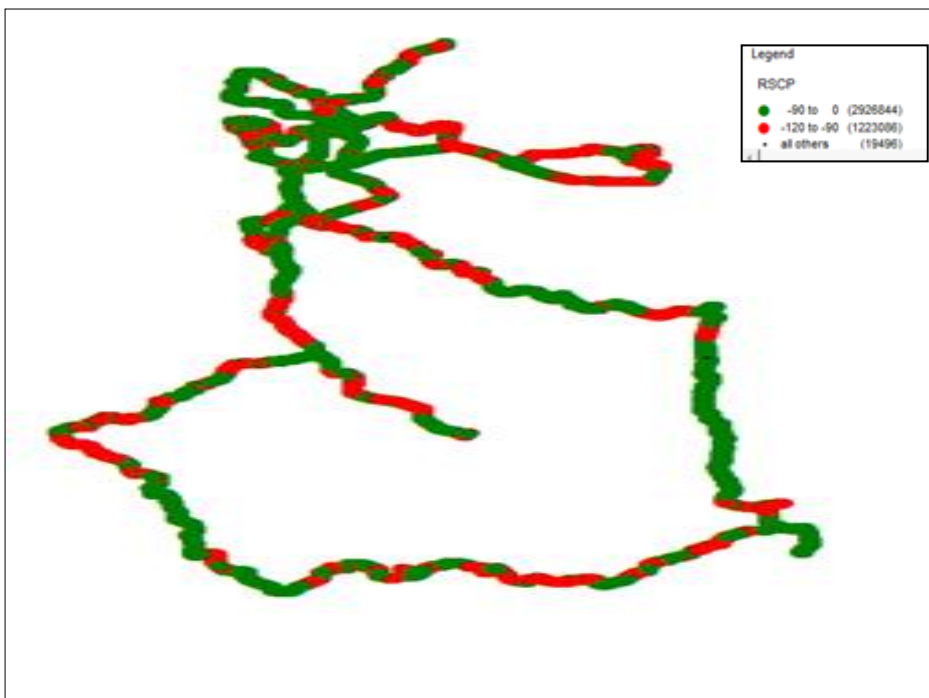
Technology	Coverage Rate %
2G	80.0
3G	70.0

### 2G



Overall RxLevel	Sample %
[Max >=-75]	36
[-75 >=-85]	26
[-85 >=-95]	26
[-95 >=Min]	12
<b>Total</b>	<b>100</b>

### 3G



Overall RSCP	Sample %
[Max >=-70]	38.5
[-70 >=-80]	15
[-80 >=-90]	17
[-90 >=Min]	29.5
<b>Total</b>	<b>100</b>

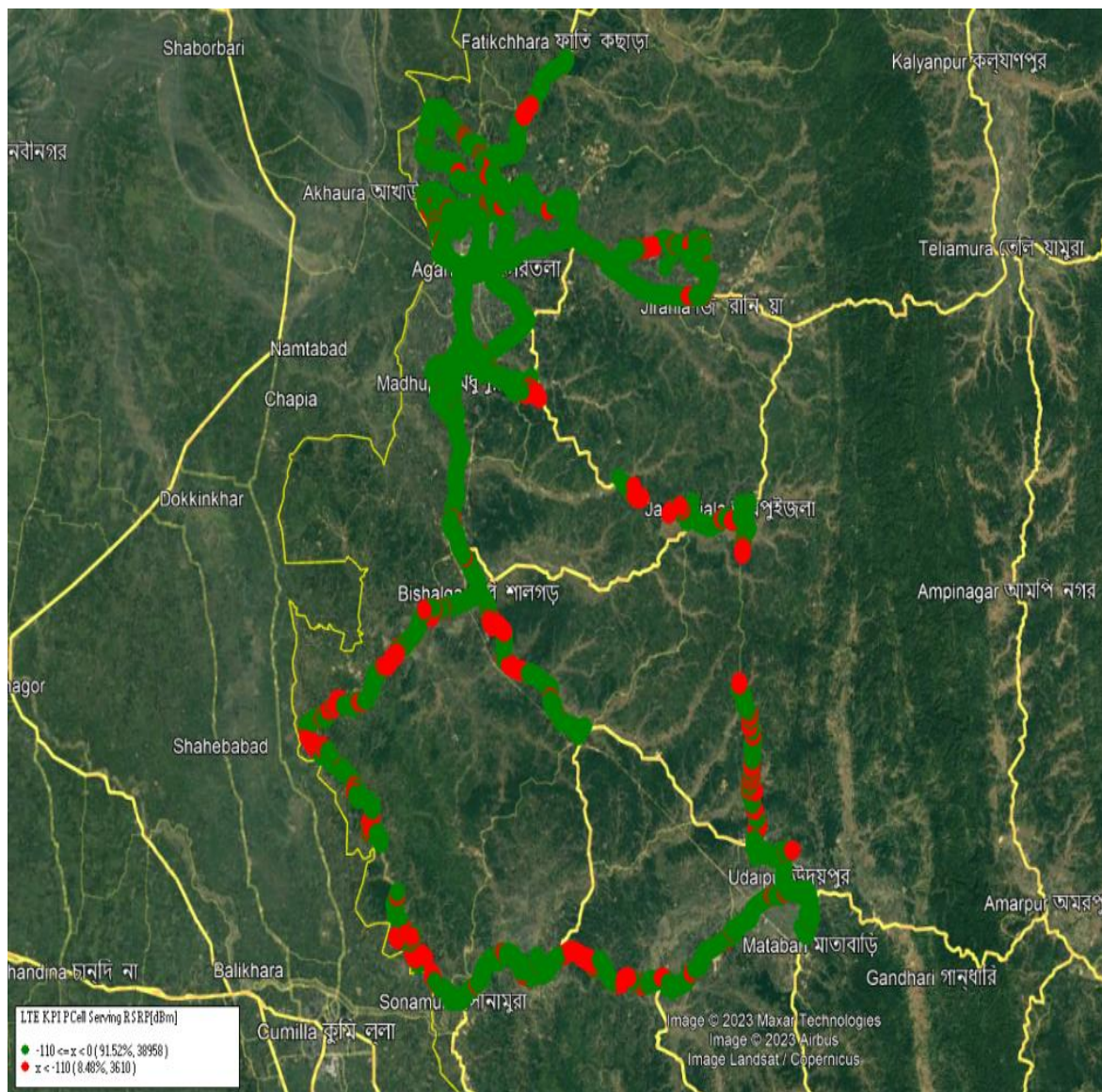


# I. Coverage Details

## RJIO

Technology	Coverage Rate %
4G	91.52

### 4G



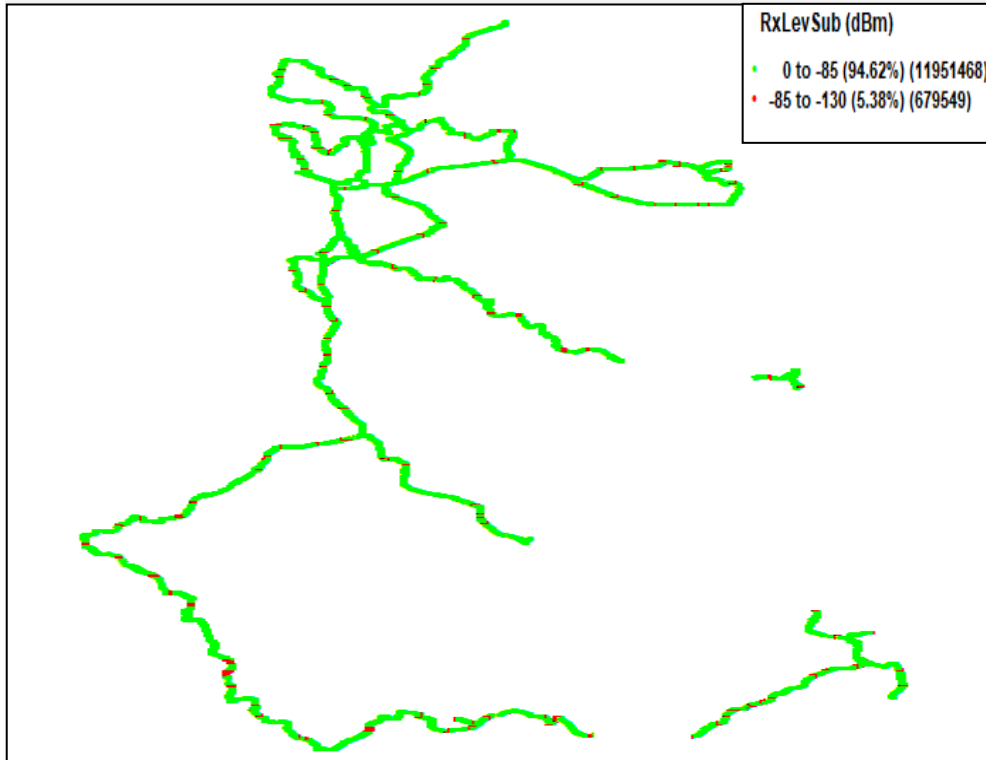
Overall RSRP	Sample %
[Max >= -80]	26.95
[-80 >= -90)	24.72
[-90 >= -110)	39.85
[-110 >= Min]	8.48
<b>Total</b>	<b>100</b>

# I. Coverage Details

## VIL

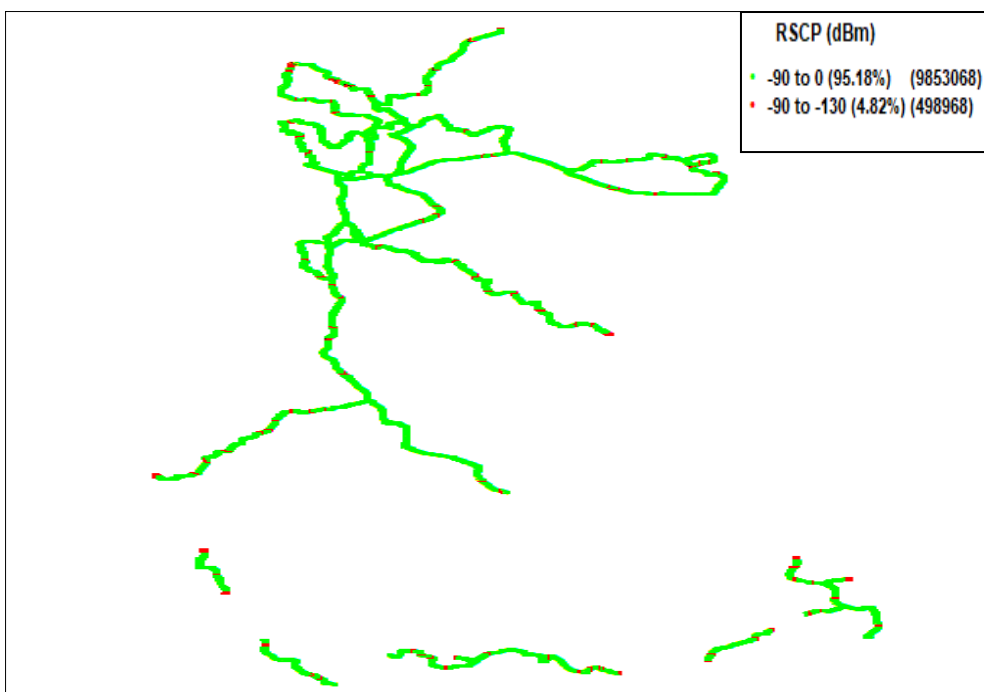
Technology	Coverage Rate %
2G	94.62
3G	95.18

### 2G



Overall RxLevel	Sample %
[Max >=-75]	39.63
[-75 >=-85)	54.99
[-85 >=-95)	3.90
[-95 =Min)	1.48
<b>Total</b>	<b>100</b>

### 3G

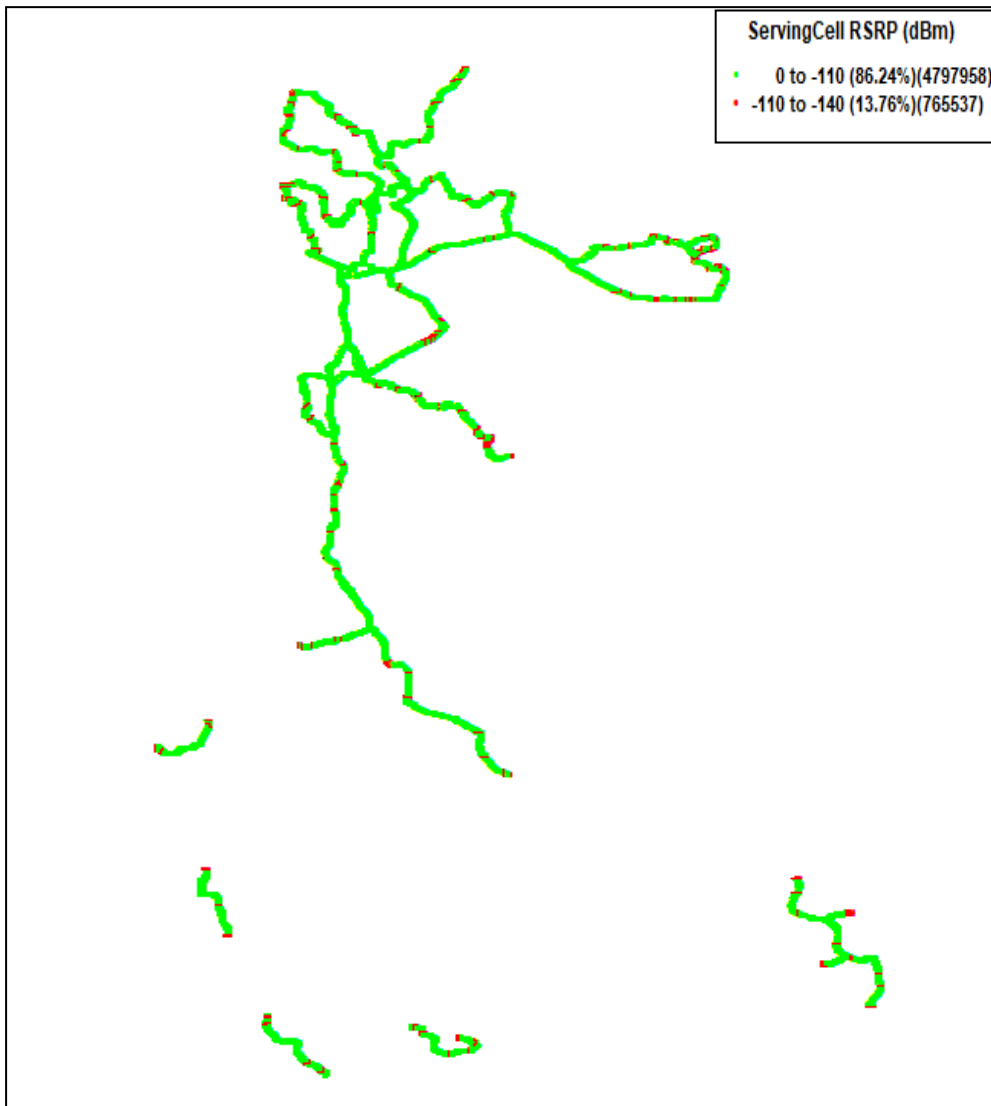


Overall RSCP	Sample %
[Max >=-70]	26.73
[-70 >=-80)	32.27
[-80 >=-90)	36.18
[-90 >=Min)	4.82
<b>Total</b>	<b>100</b>

# I. Coverage Details

VIL

Technology	Coverage Rate %
4G	86.24
<b>4G</b>	



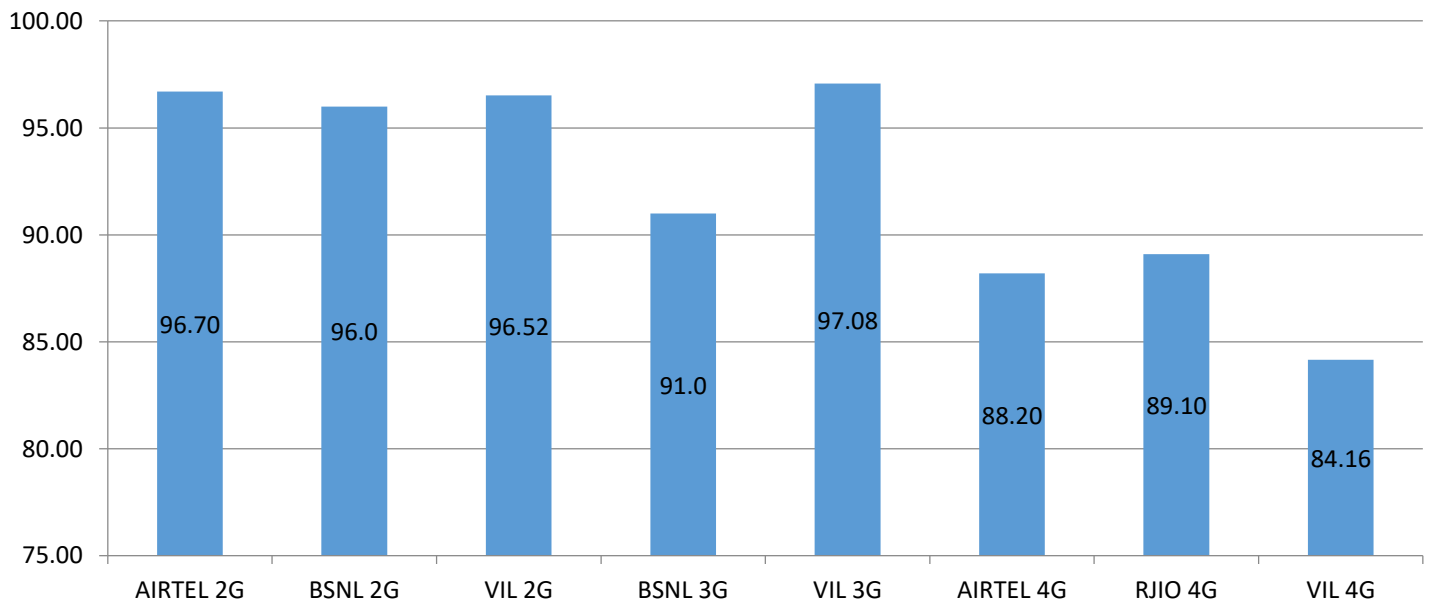
Overall RSRP	Sample %
[Max >=-80]	20.95
[-80 >=-90)	26.84
[-90 >=-110)	38.45
[-110 >=Min)	13.76
<b>Total</b>	<b>100</b>

## II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Quality  $\leq 5$  for GSM, Ec/No  $\geq -14$  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	96.70
BSNL 2G	96.0
VIL 2G	96.52
BSNL 3G	91.0
VIL 3G	97.08
AIRTEL 4G	88.20
RJIO 4G	89.10
VIL 4G	84.16

### Rx Quality %



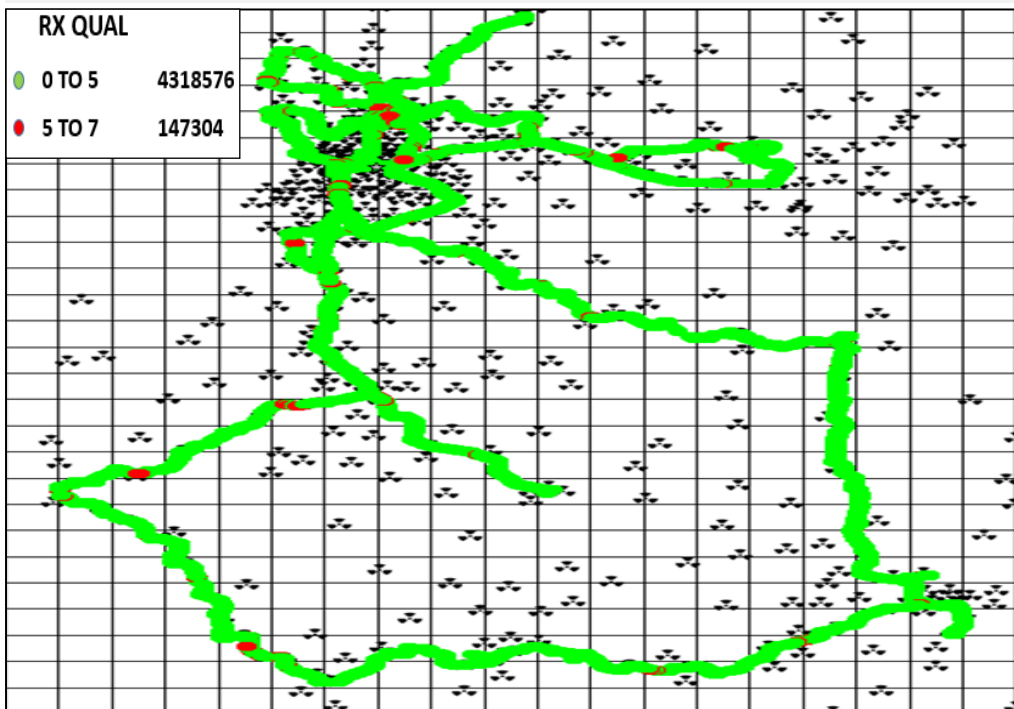


## II. Quality Details

### AIRTEL

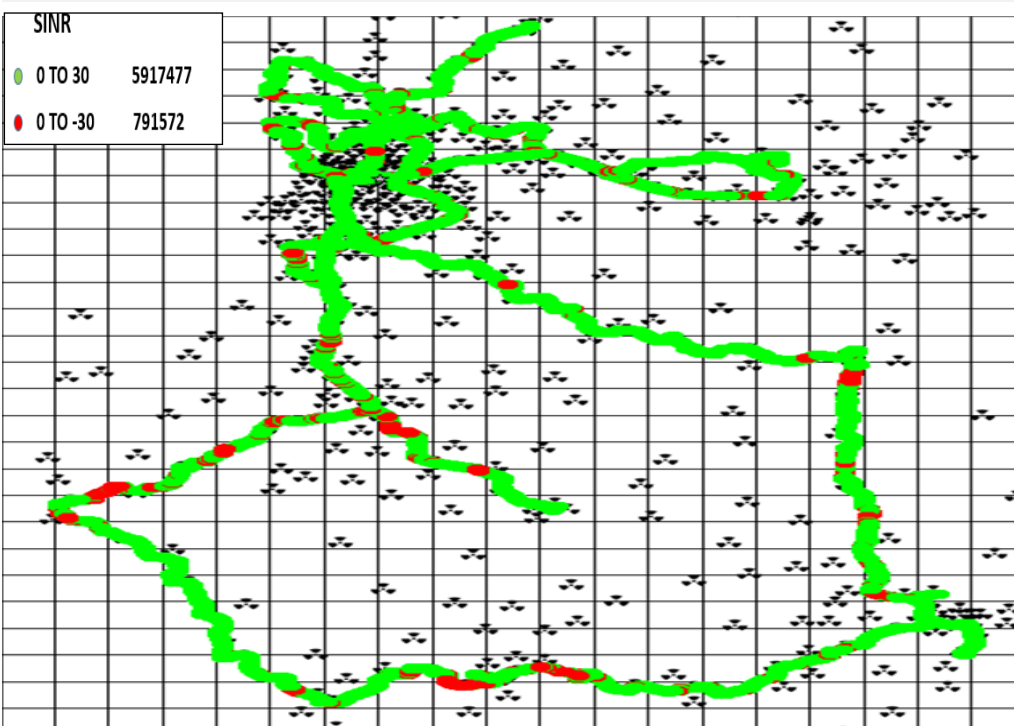
Technology	Rx Quality %
2G	96.70
4G	88.20

#### 2G



Overall Rx Quality	Sample %
(Min <=2)	85.90
(2 <=3)	2.70
(3 <=4)	2.90
(4 <=5)	5.20
(5 <=Max)	3.30
<b>Total</b>	<b>100</b>

#### 4G



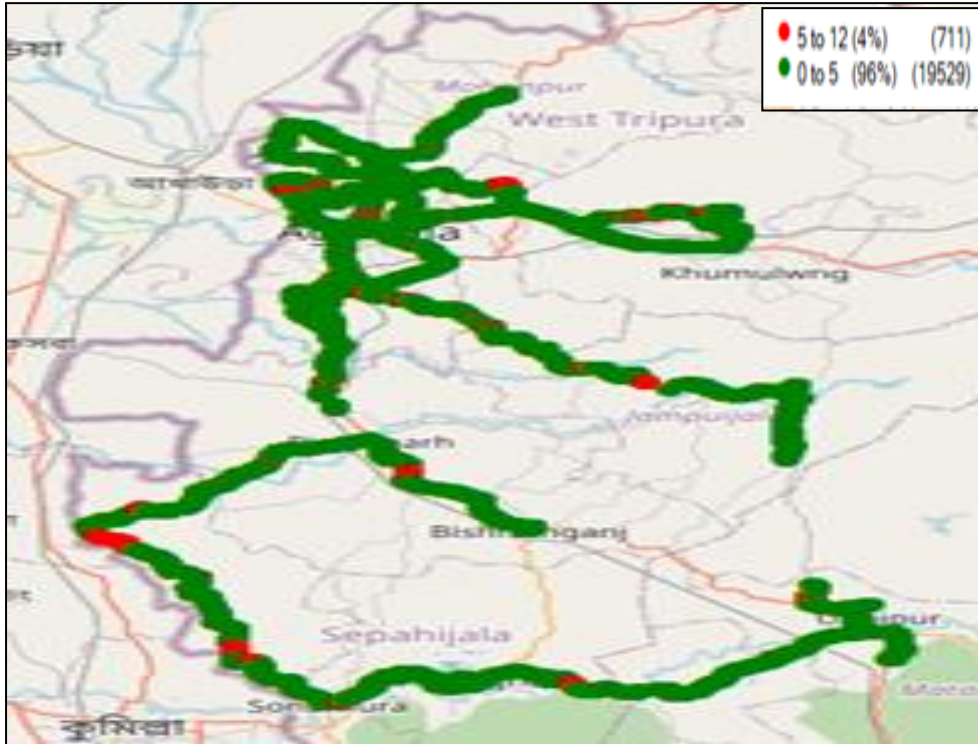
Overall SINR	Sample %
(Min <=0)	11.81
(0 <=5)	19.23
(5 <=10)	22.07
(10 <=15)	20.44
(15 <=Max)	26.45
<b>Total</b>	<b>100</b>

## II. Quality Details

### BSNL

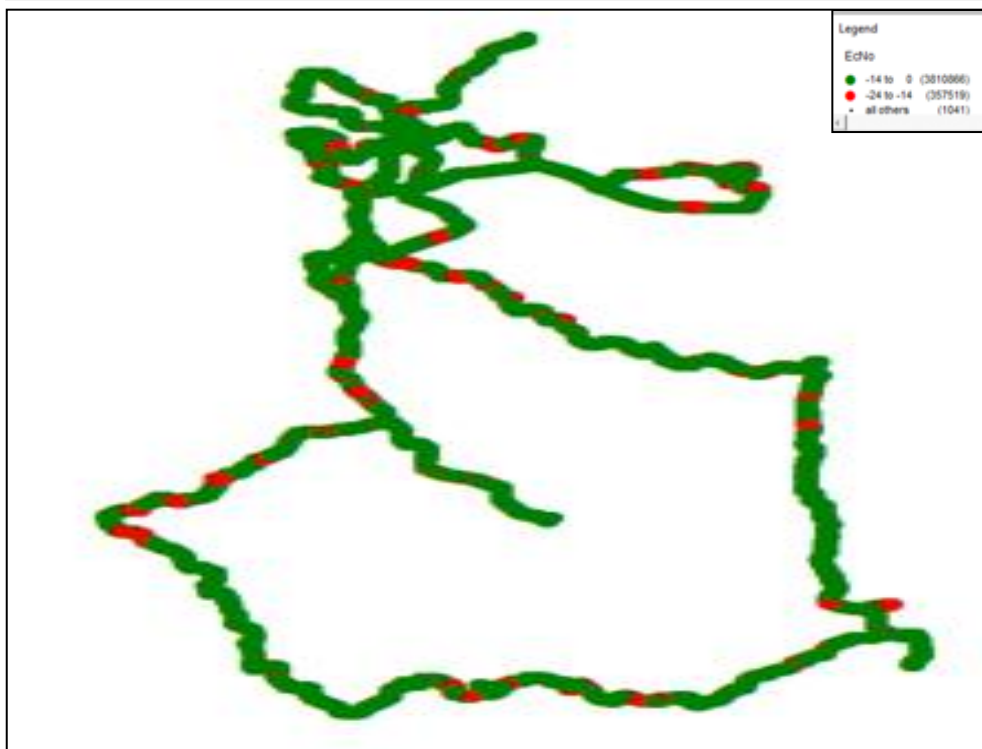
Technology	Rx Quality %
2G	96.0
3G	91.0

#### 2G



Overall Rx Quality	Sample %
(Min <=2)	84.50
(2 <=3)	3.50
(3 <=4)	2.50
(4 <=5)	2.0
(5 <=Max)	7.50
<b>Total</b>	<b>100</b>

#### 3G

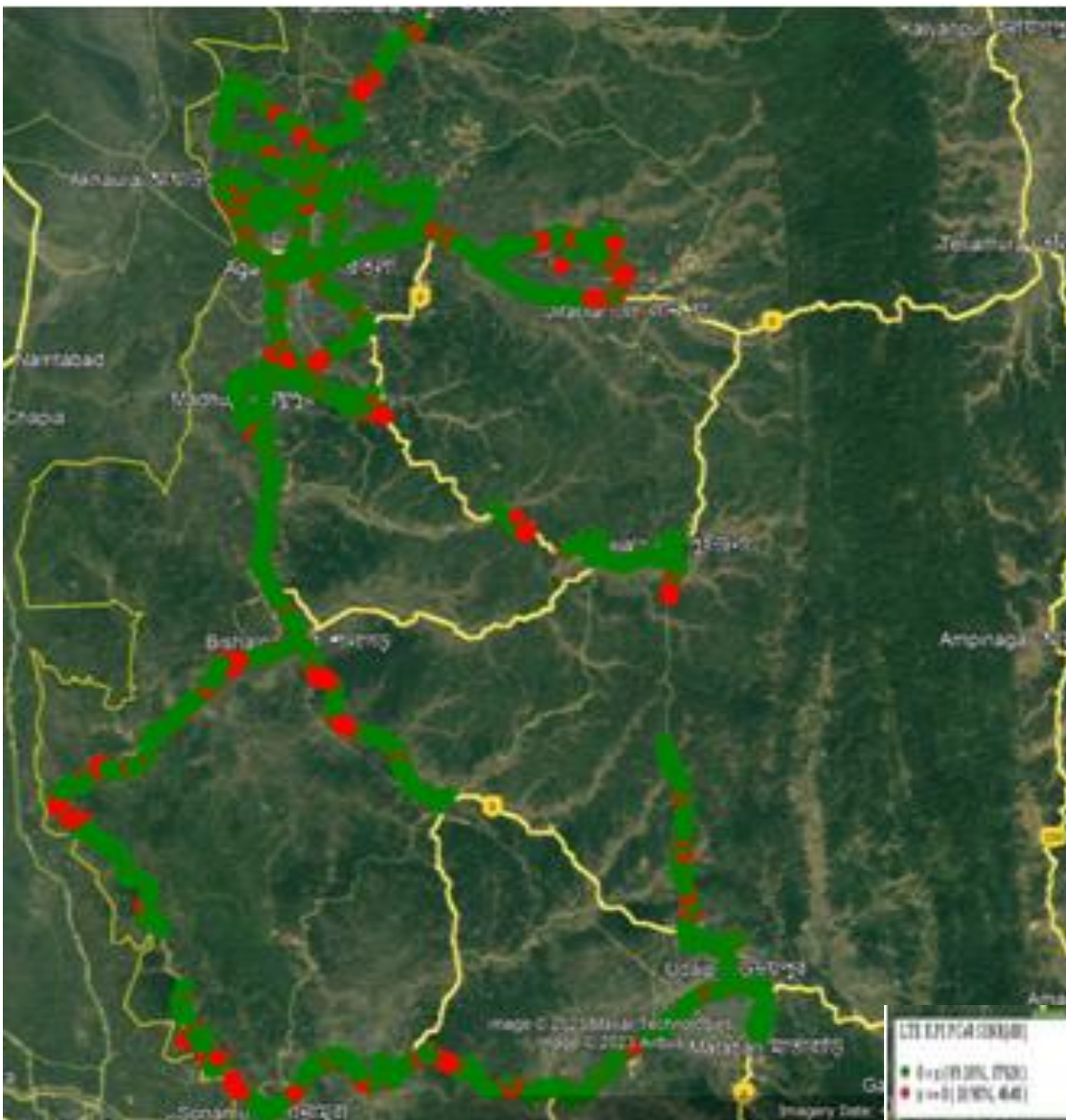


Overall EcNo	Sample %
(Max <=-6)	44.50
(-6 <=-9)	20.0
(-9 <=-11)	17.0
(-11 <=-14)	9.50
(-14 <= Min)	9.0
<b>Total</b>	<b>100</b>

## II. Quality Details

### RJIO

Technology	Rx Quality %
4G	89.10
<b>4G</b>	



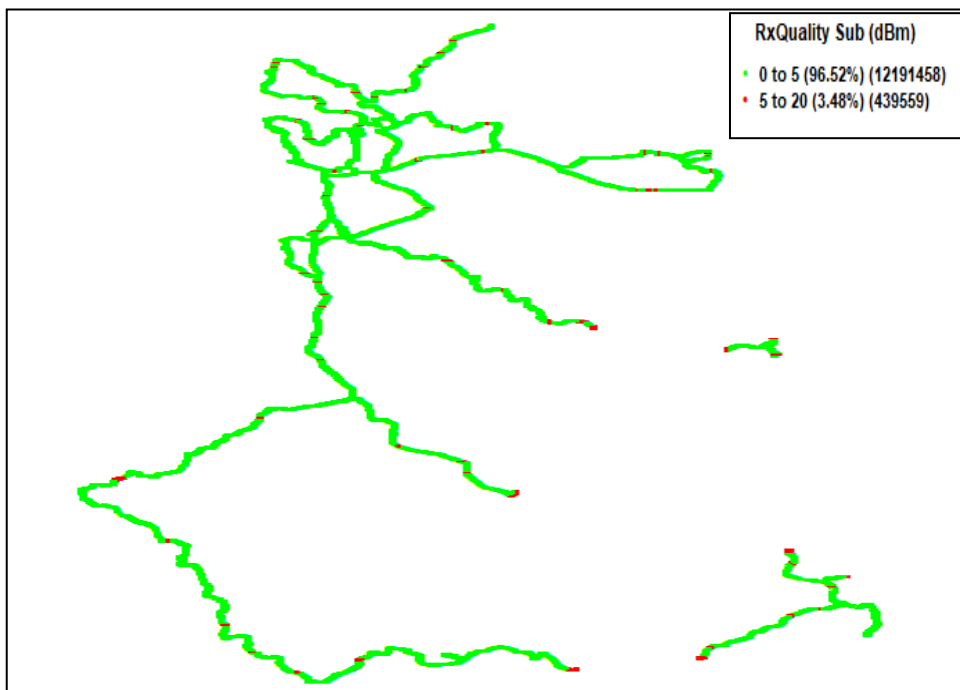
Overall SINR	Sample %
(Min <=0)	10.90
(0 <=5)	18.32
(5 <=10)	21.66
(10 <=15)	19.98
(15 <=Max)	29.14
<b>Total</b>	<b>100</b>

## II. Quality Details

### VIL

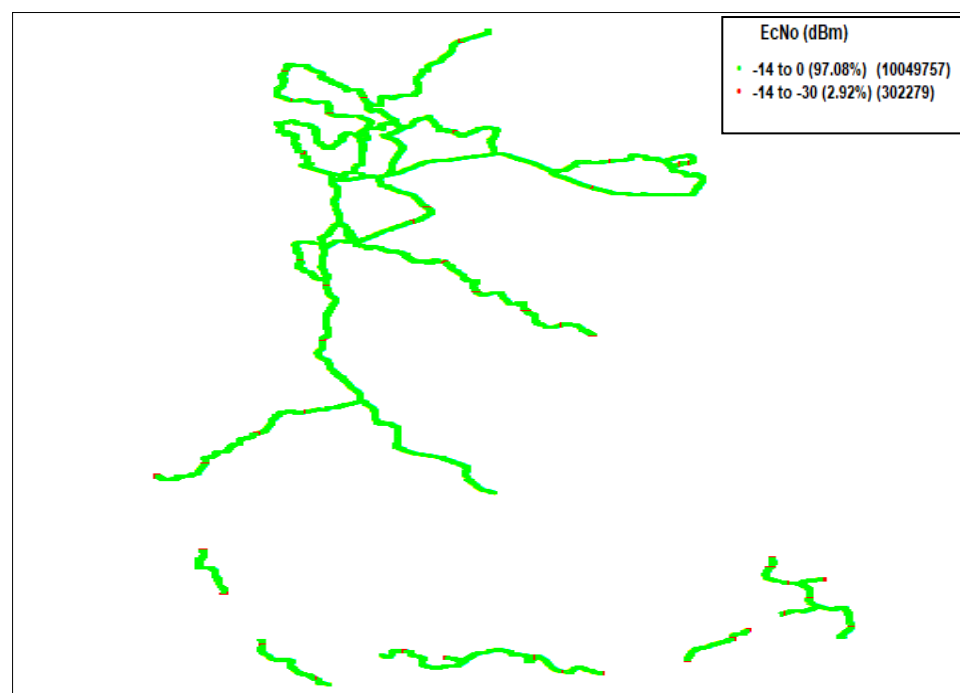
Technology	Rx Quality %
2G	96.52
3G	97.08

#### 2G



Overall Rx Quality	Sample %
(Min <=2)	19.60
(2 <=3)	23.54
(3 <=4)	25.03
(4 <=5)	28.35
(5 <=Max)	3.48
<b>Total</b>	<b>100</b>

#### 3G



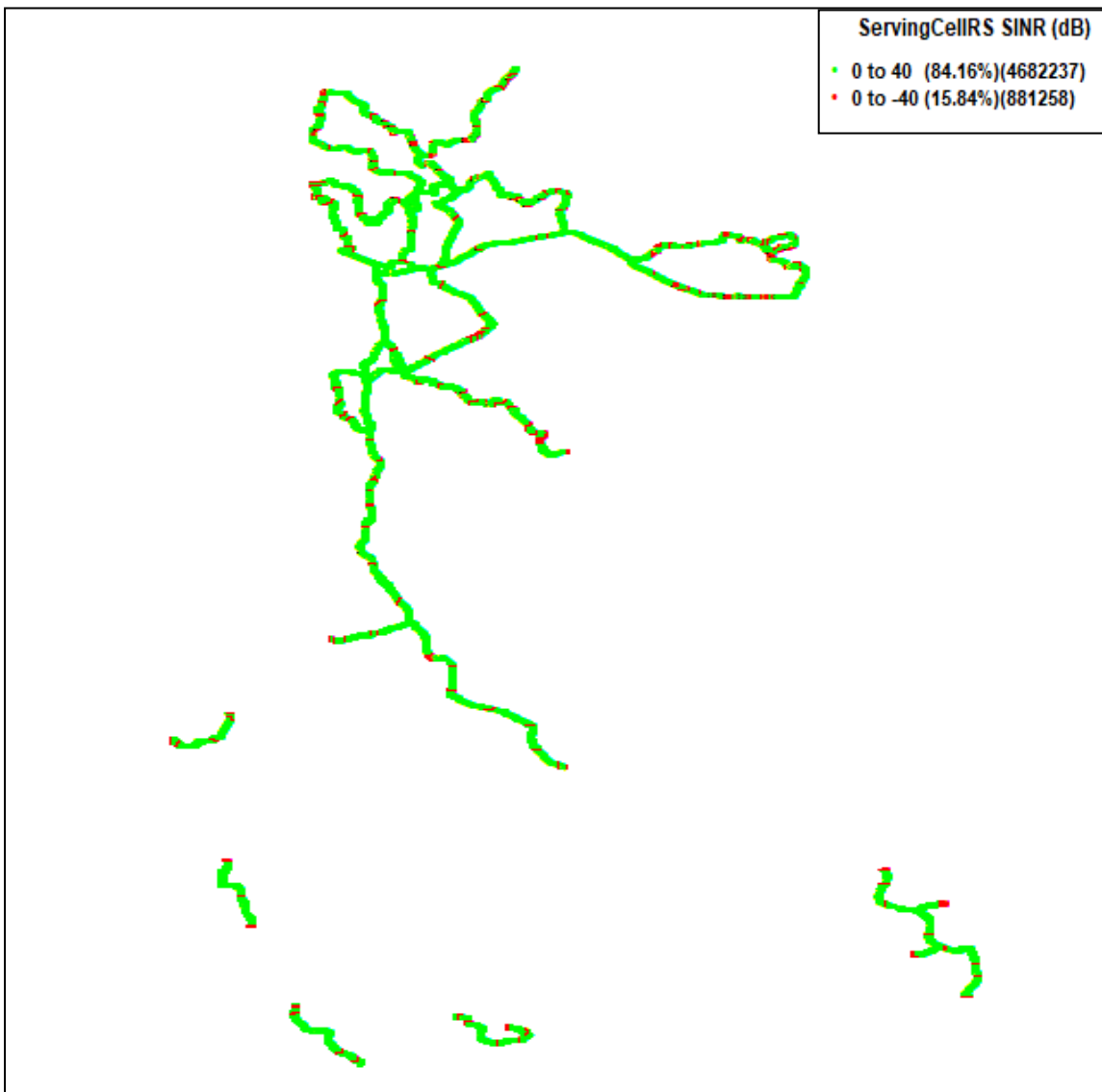
Overall EcNo	Sample %
(Max <=-6)	22.51
(-6 <=-9)	26.89
(-9 <=-11)	24.22
(-11 <=-14)	23.46
(-14 <= Min)	2.92
<b>Total</b>	<b>100</b>

## II. Quality Details

### VIL

Technology	Rx Quality %
4G	84.16

### 4G



Overall SINR	Sample %
(Min <=0)	15.84
(0 <=5)	8.29
(5 <=10)	15.23
(10 <=15)	40.72
(15 <=Max)	19.92
<b>Total</b>	<b>100</b>



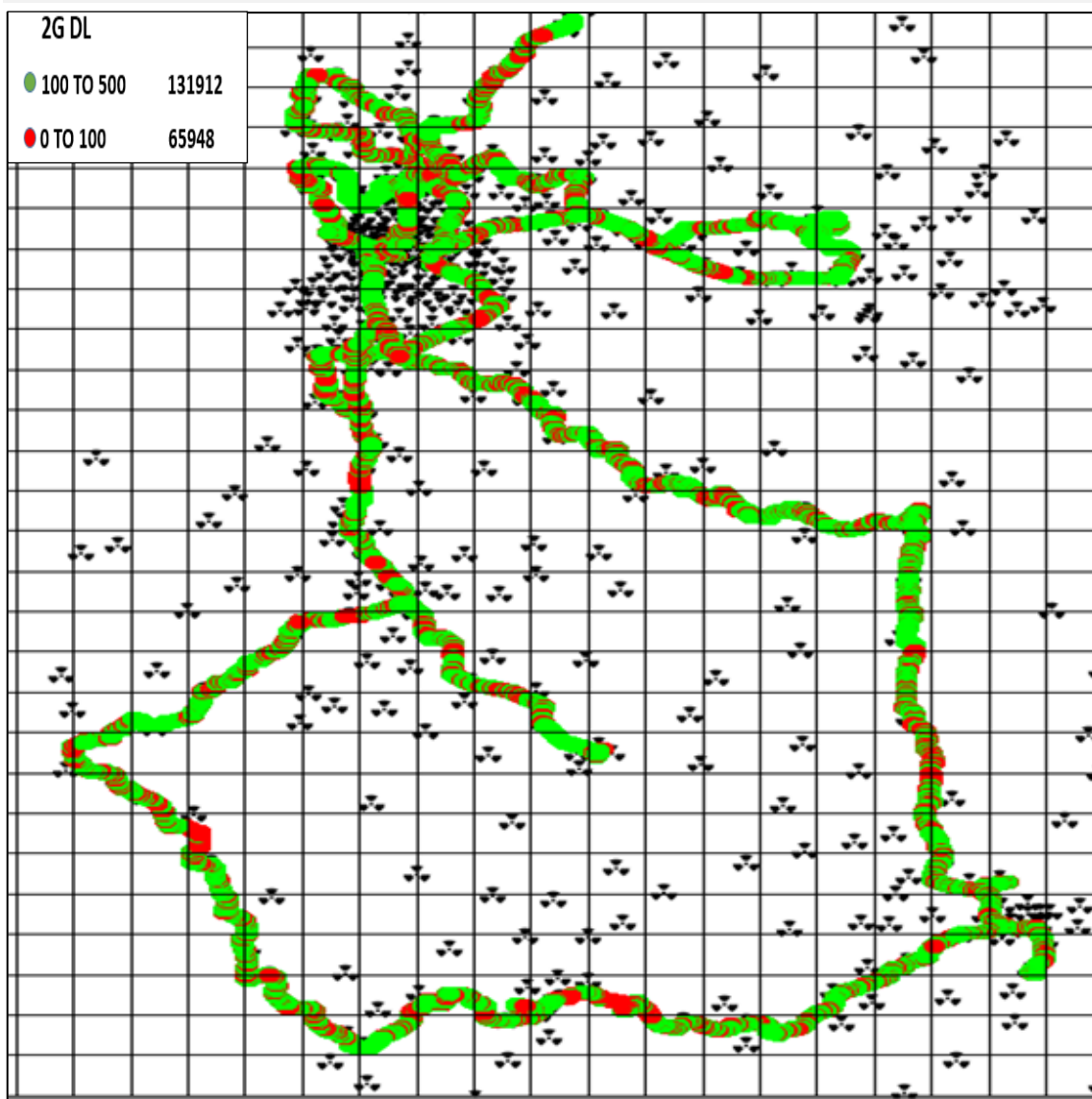
# IV. Dynamic Data Test- 2G DL Details

## AIRTEL

### Dynamic Data Testing Complete 324 Kms

Data KPIs - Overall	<b>2G</b>
Average Download Throughput (Kbps)	51.50

### 2G



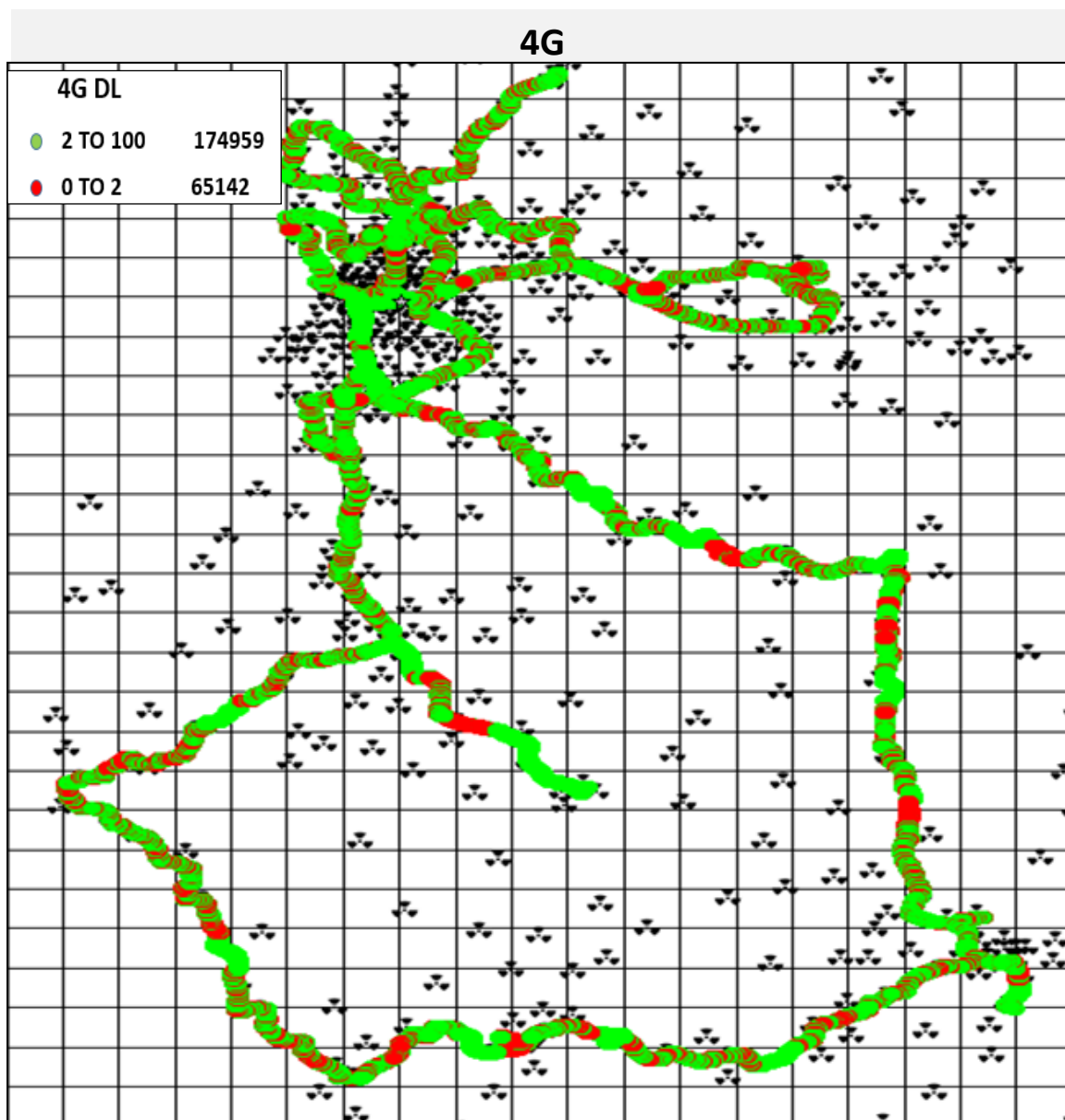
AVG. DOWNLOAD SPEED (Kbps)	51.50
% FILE TRANSFER COMPLETE	63.0
DL throughput	<b>Sample %</b>
0 to 50 Kbps	5.2
50 to 100 Kbps	28.2
100 to 200 Kbps	52.7
200 to 300 Kbps	13.4
>300 Kbps	0.5
<b>Total</b>	<b>100</b>

# IV. Dynamic Data Test- 4G DL Details

## AIRTEL

### Dynamic Data Testing Complete 324 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	7.95



AVG. DOWNLOAD SPEED (Mbps)	7.95
% FILE TRANSFER COMPLETE	82.05
DL throughput	<b>Sample %</b>
0 to 1 Mbps	6.7
1 to 2 Mbps	34.3
2 to 5 Mbps	20.4
5 to 10 Mbps	19.7
>10 Mbps	18.9
<b>Total</b>	<b>100</b>

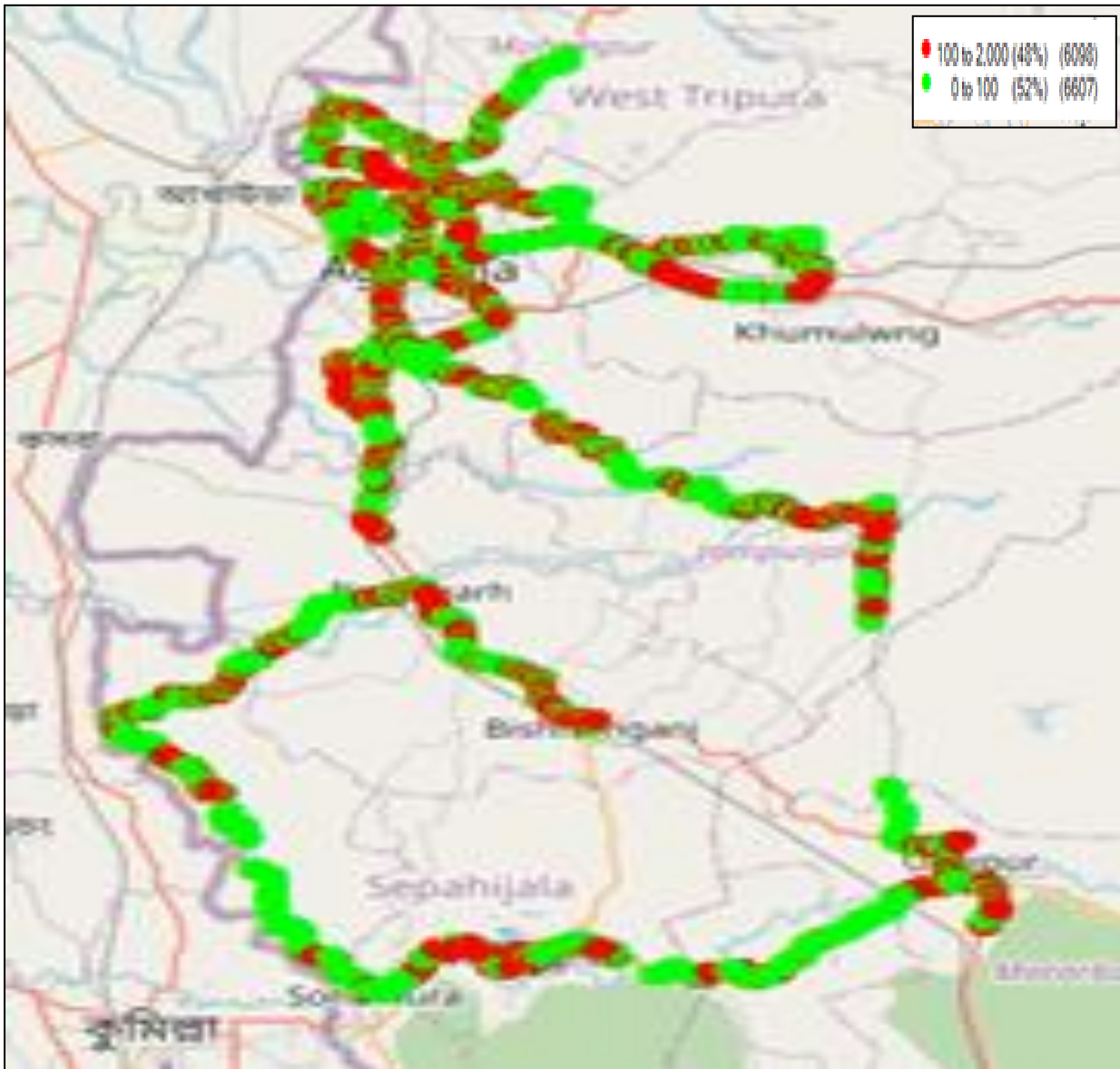
# IV. Dynamic Data Test- 2G DL Details

## BSNL

### Dynamic Data Testing Complete 324 Kms

Data KPIs - Overall	2G
Average Download Throughput (Kbps)	135.40

### 2G



AVG. DOWNLOAD SPEED (Kbps)	135.40
% FILE TRANSFER COMPLETE	84.20
DL throughput	<b>Sample %</b>
0 to 50 Kbps	34
50 to 100 Kbps	18
100 to 200 Kbps	30
200 to 300 Kbps	18
>300 Kbps	0
<b>Total</b>	<b>100</b>

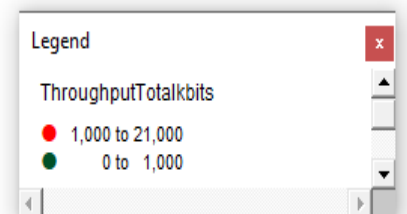
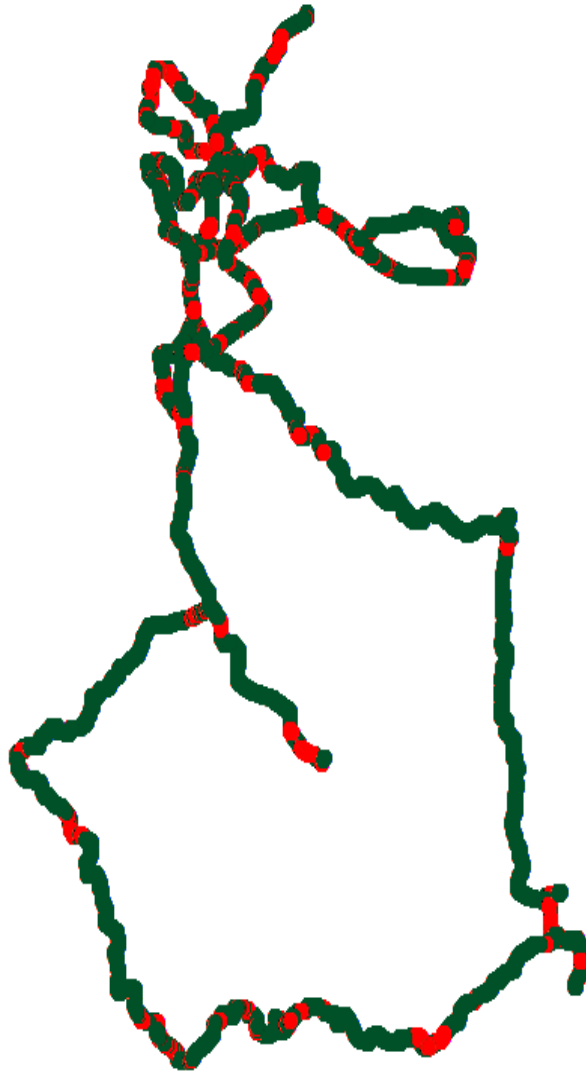


# IV. Dynamic Data Test- 3G DL Details

## BSNL

### Dynamic Data Testing Complete 324 Kms

Data KPIs - Overall	3G
Average Download Throughput (Mbps)	2.07
<b>3G</b>	



AVG. DOWNLOAD SPEED (Mbps)	2.07
% FILE TRANSFER COMPLETE	78.20
DL throughput	<b>Sample %</b>
0 to 0.5 Mbps	73
0.5 to 1 Mbps	4
1 to 2 Mbps	6
2 to 5 Mbps	10
>5 Mbps	7
<b>Total</b>	<b>100</b>

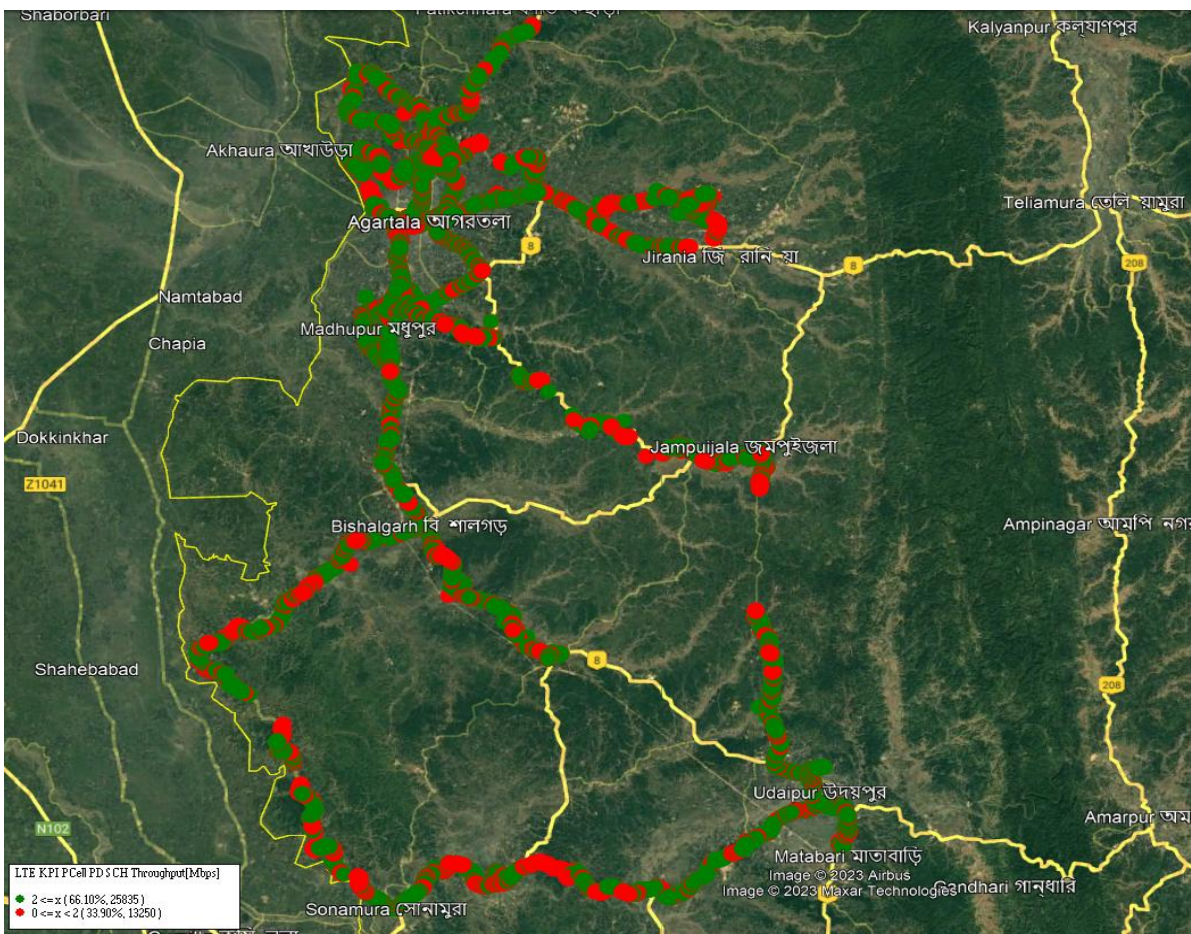
# IV. Dynamic Data Test- 4G DL Details

## RJIO

### Dynamic Data Testing Complete 324 Kms

Data KPIs - Overall	4G
Average Download Throughput (Mbps)	7.58

### 4G



AVG. DOWNLOAD SPEED (Mbps)	7.58
% FILE TRANSFER COMPLETE	100
DL throughput	<b>Sample %</b>
0 to 1 Mbps	25.85
1 to 2 Mbps	8.05
2 to 5 Mbps	20.12
5 to 10 Mbps	19.38
>10 Mbps	26.6
<b>Total</b>	<b>100</b>

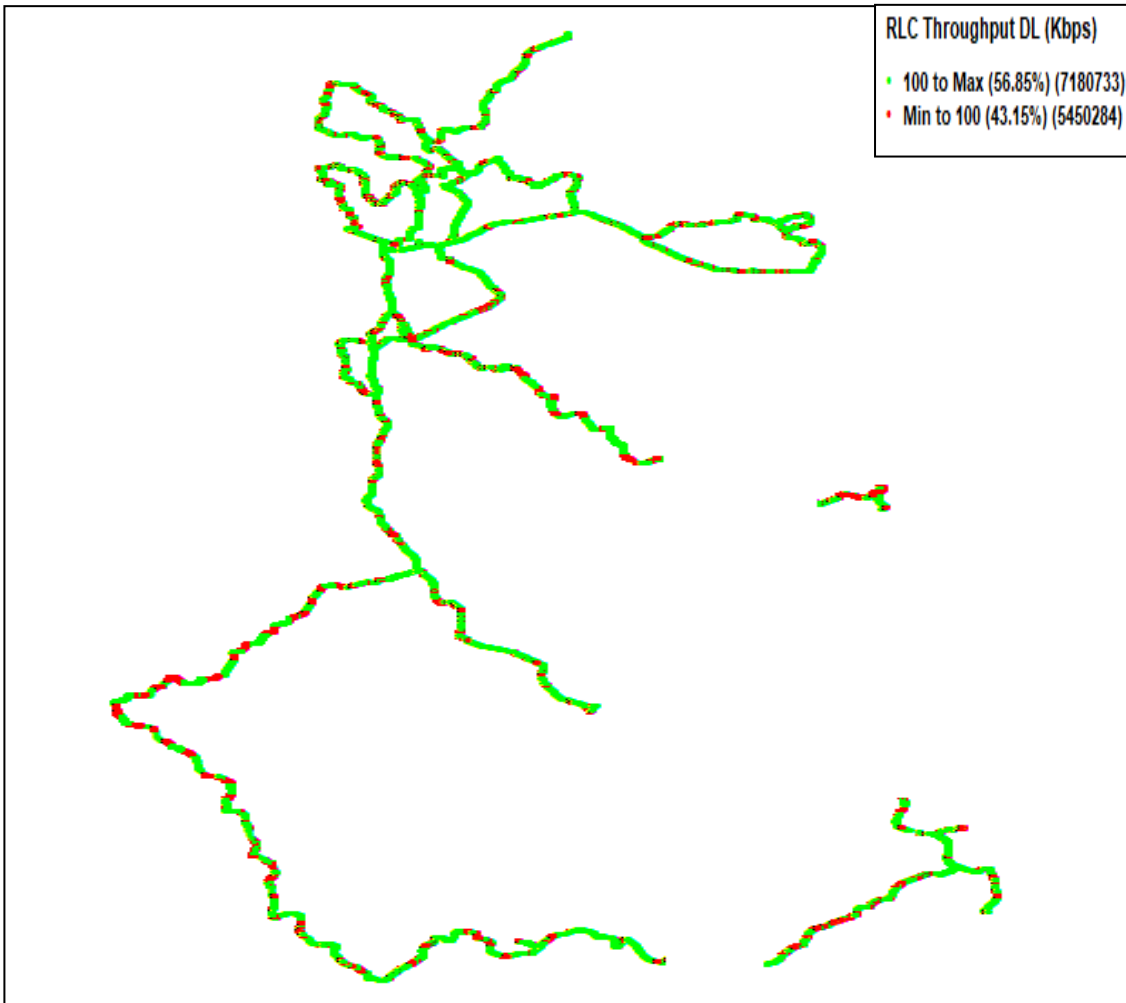
# IV. Dynamic Data Test-2G DL Details

## VIL

### Dynamic Data Testing Complete 324 Kms

Data KPIs – Overall	2G
Average Download Throughput (Kbps)	69.39

### 2G



AVG. DOWNLOAD SPEED (Kbps)	69.39
% FILE TRANSFER COMPLETE	87.99
DL throughput	<b>Sample %</b>
0 to 50 Kbps	30.12
50 to 100 Kbps	13.03
100 to 200 Kbps	24.49
200 to 300 Kbps	19.33
>300 Kbps	13.03
<b>Total</b>	<b>100</b>

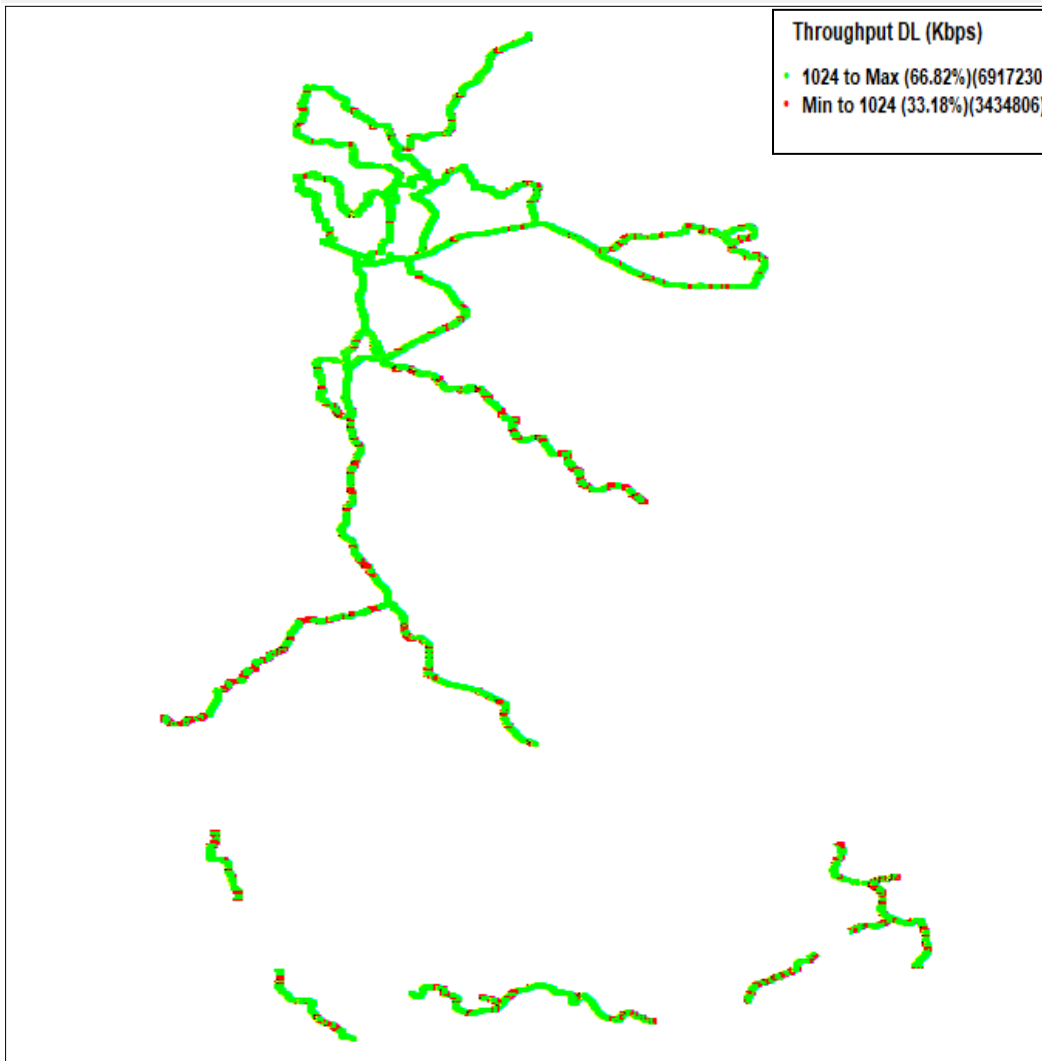
# IV. Dynamic Data Test- 3G DL Details

## VIL

### Dynamic Data Testing Complete 324 Kms

Data KPIs - Overall	3G
Average Download Throughput (mbps)	1.90

### 3G



AVG. DOWNLOAD SPEED (mbps)	1.90
% FILE TRANSFER COMPLETE	88.74
DL throughput	<b>Sample %</b>
0 to 0.5 Mbps	20.12
0.5 to 1 Mbps	13.06
1 to 2 Mbps	25.74
2 to 5 Mbps	28.03
>5 Mbps	13.05
<b>Total</b>	<b>100</b>

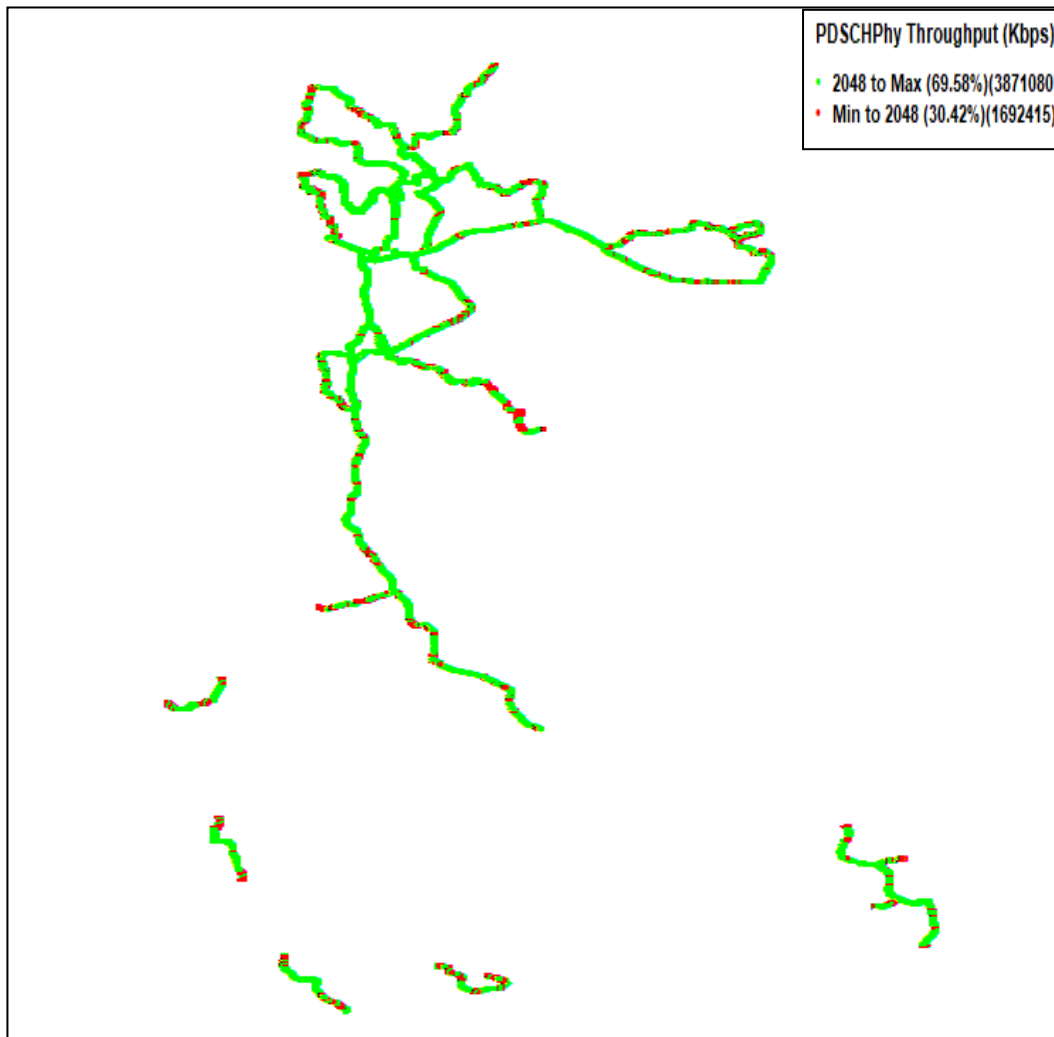
# IV. Dynamic Data Test- 4G DL Details

## VIL

### Dynamic Data Testing Complete 324 Kms

Data KPIs – Overall	4G
Average Download Throughput (Mbps)	3.41

### 4G



AVG. DOWNLOAD SPEED (Mbps)	3.41
% FILE TRANSFER COMPLETE	96.55
DL throughput	<b>Sample %</b>
0 to 1 Mbps	11.49
1 to 2 Mbps	18.93
2 to 5 Mbps	35.44
5 to 10 Mbps	22.18
>10 Mbps	11.96
<b>Total</b>	<b>100</b>