

# Operator Assisted Drive Test Report

## BARIPADA SSA

NOVEMBER - 2024

(RO, HYDERABAD)

**Key Performance Indicators:** All TSPs have met the Drop Call Rate (DCR) benchmark of 2%. All TSPs have met the Call Setup Success Rate (CSSR) of 95%. All TSPs have met the Rx Quality of 95% **except BSNL 2G, Airtel VoLTE & JIO VoLTE.**

The Operator Assisted Drive Test (OADT) has been carried out by Regional Office, Hyderabad with the help of Service Providers in Baripada City and surrounding areas Betnoti, Udala, Kaptipada Sarat, Bangiripos, Rairangpur & Jashipur, including important National Highway and State Highways from 9:00 AM to 8:00 PM during 26<sup>th</sup> Nov to 29<sup>th</sup> Nov'2024. The drive test covered drive route of 430 KMs & 6 hotspots over a period of 4 days. Approximately 655 calls were made each of the Network. Three 2G networks, One 3G network and Three LTE network covering four TSPs.

Overview

Voice  
Summary

Data  
Summary

# Overview

TRAI Regional Office, Hyderabad conducted Operator Assisted Drive Test from 26<sup>th</sup> November 2024 to 29<sup>th</sup> November 2024 covering various locations in Baripada City & surrounding areas Baripada, Baisinga, Betnoti, Barsahi, Dukura, Khunta, Udala, Kaptipada, Sarat.Bisoi, Rairangpur and Joshipur. The performance of Airtel, BSNL, JIO and Vodafone Idea were monitored across various technologies (2G, 3G and 4G). 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, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

**Data:** Download and Upload Throughputs, Web Browsing Delay and Latency Drive Test.

## Drive Test Details :

**Voice Tests:** Calls were made for 90 sec duration with wait time of 10 sec between calls in all technologies. The drive test covered a drive route of approximately 430 KMs over a period of 4 days from 26<sup>th</sup> to 29<sup>th</sup> November 2024 . Approximately 655 calls were made for each of the 7 networks: three 2G (Lock Mode) networks, one 3G (Dual mode) networks and three VoLTE network covering 4 unique TSPs.

## Data Tests:

1.Dynamic data test was conducted for 430 kms over a period of 4 days for download throughput for 3G technologies.

2. Data Tests were performed at 6 static locations for 2G, 3G technologies.

\*For Voice and Data KPI's, 2G measurement is done with UE locked mode, 3G measurement is done with UE in Dual mode (2G & 3G) and 4G measurement is done with UE in Free Mode.

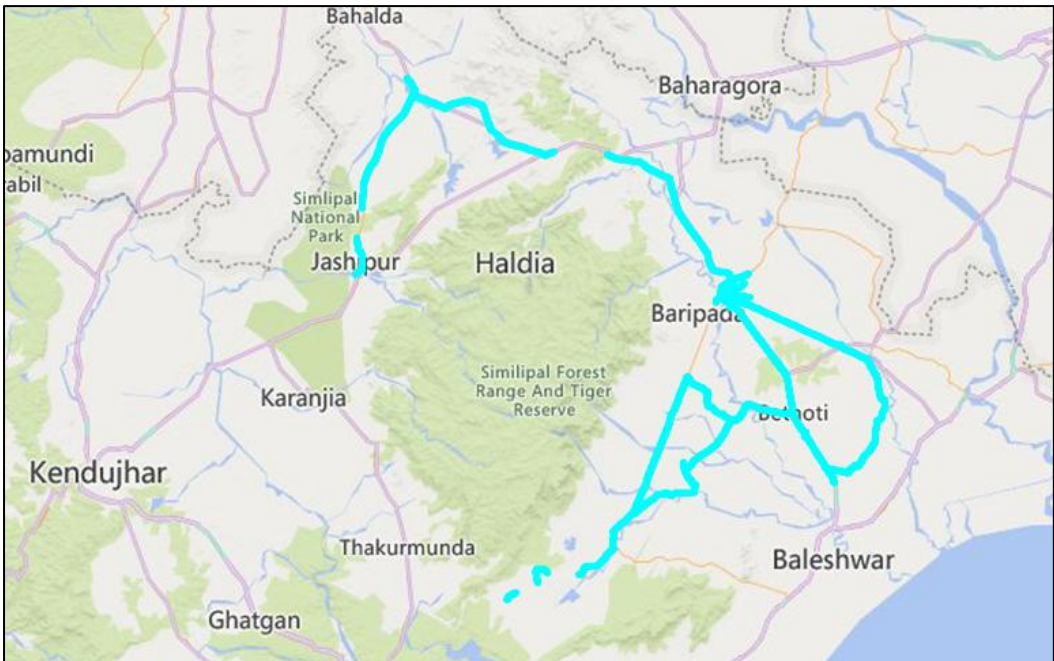
\* 3G KPI's which are calculated from UE in Dual Mode (2G & 3G) includes samples and events of 2G.

\* 4G KPI's which are calculated from the UE in Free Mode included samples and events of 2G & 3G.14

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

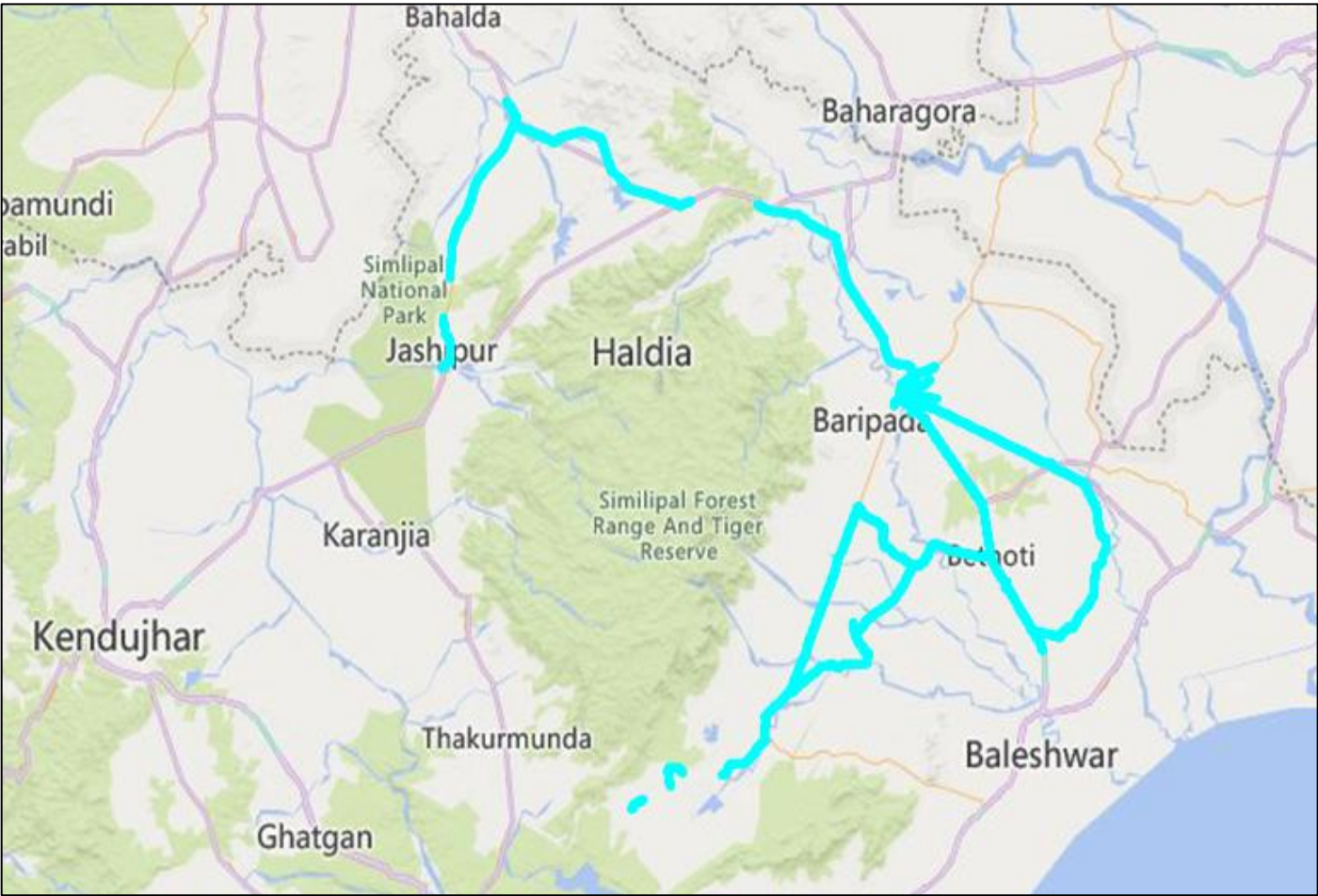
# Overview

## Voice & Dynamic Data Test Drive Route



Area Covered –Sarat (Day 1)	Area Covered-Rairangpur (Day 2)	Area covered –Udala (Day 3)	Area covered - Baripada (Day 4)
Betnoti Railway Station	Kuchei Chowk	Chitrada Market	Baleswar Golei
Badasahi Block	Kuliana Market	Jhinkria	Baripada Railway Station
Dukura market	Kalabadia Market	Anla	Palboni Square
Khunta Block	Bangriposi Market	Baisinga	Takapur University Area
Udala Market	Biosi Market	Betnoti market	Dargadei Squire
Nuasahi Market	Bodampalia	Badasahi Market	Murga Badi
Kaptipada Market	Rairangpur Market	Similabandha Village	Belgadia Palace
Sarat Market	Mahuldiha	Jaida Village	Asita Market
Kainfulia		Udala Market	PRM Medical College,Sankhabhanga
			Madhuban Colony area

## Data Service Test- Static Locations

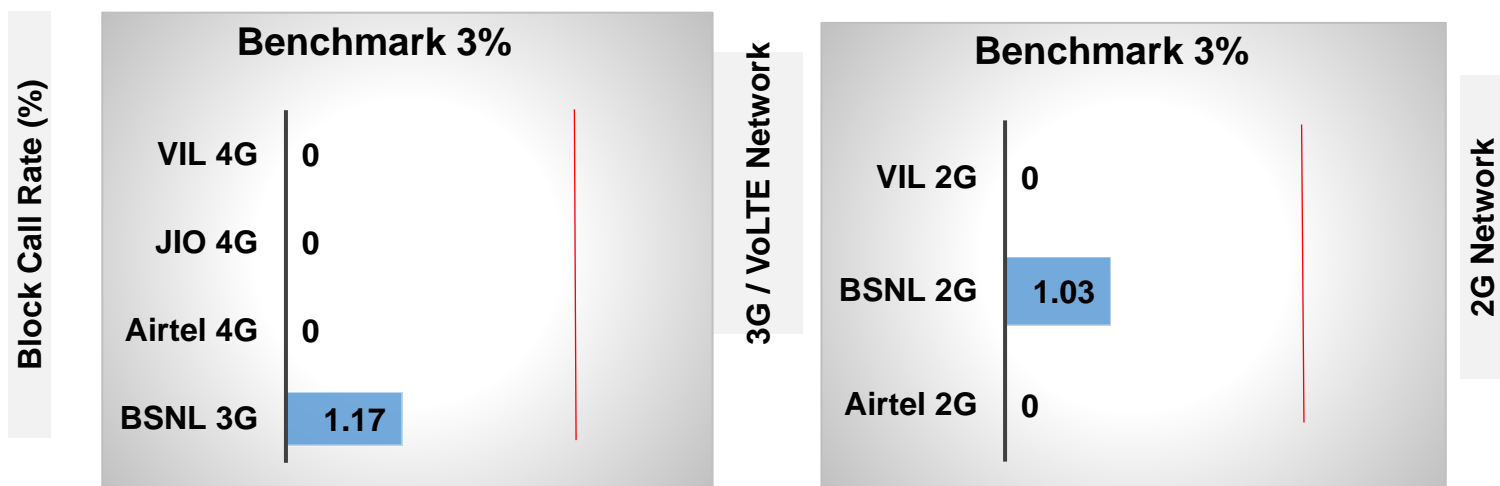
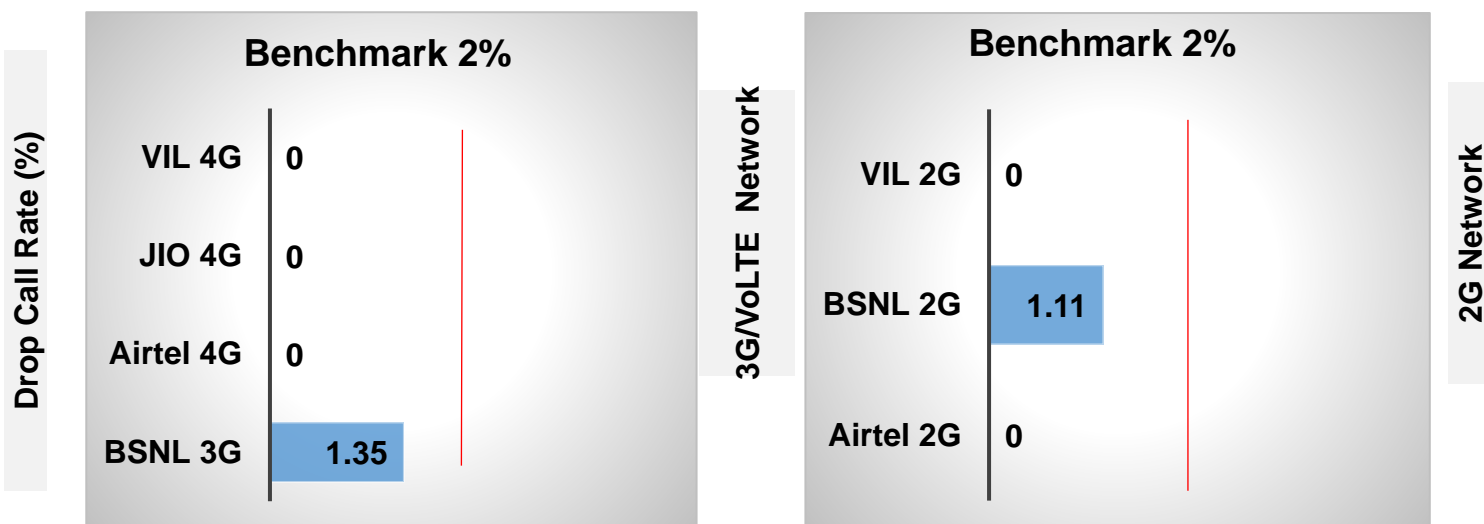


6 Static Locations
Betnoti Railway Station
Bangiriposi Bus stand
Udala Bus Stand
Baripada Railway Station
Maharaja Sriram Chandra Bhanja Deo University
PRM Medical College Campus Rangamatia

# Voice Calls

## Key Observations

QoS compliance of the TSPs in SSA for Voice across technologies 2G/3G/VoLTE:



KPIs	2G			3G	VoLTE		
	Airtel	BSNL	VIL	BSNL	Airtel	JIO	VIL
Drop Call Rate %	0	1.11	0	1.35	0	0	0
Block Call Rate %	0	1.03	0	1.17	0	0	0

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%).
- b) Call Block Rate (CBR%) benchmark of 3% was achieved by all TSP's.

# Voice Calls

## Key Observations

### Coverage

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

TSPS	2G		
	Airtel	BSNL	VIL
Coverage %	66.04	91.36	90.27

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

TSP	3G	VoLTE ( $\geq$ -110 dBm)		
	BSNL	Airtel	JIO	VIL
Coverage %	98.37	95.58	96.71	95.49

c) Percentage of time spent on 3G/VoLTE network

TSP	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent %	91.46	100	100	35.87



# Data Services Static

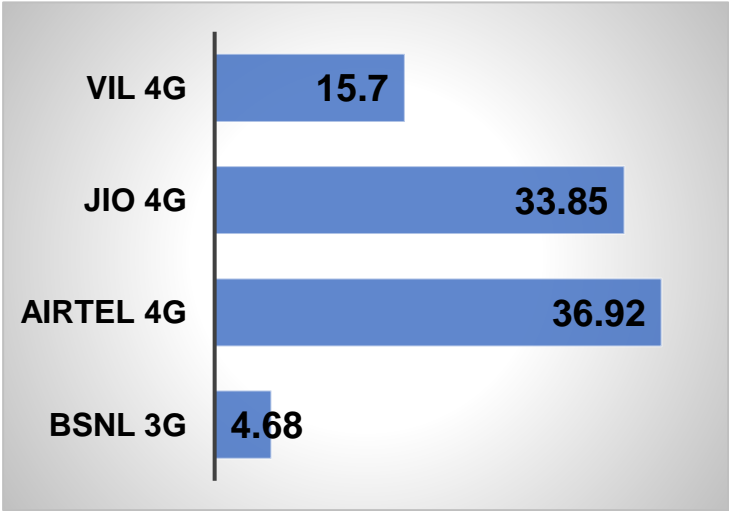
**Key Observations  
(Average of 6  
Hotspots)**

Data was tested at 6 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing delay (Flipkart, Amazon, Myntra)

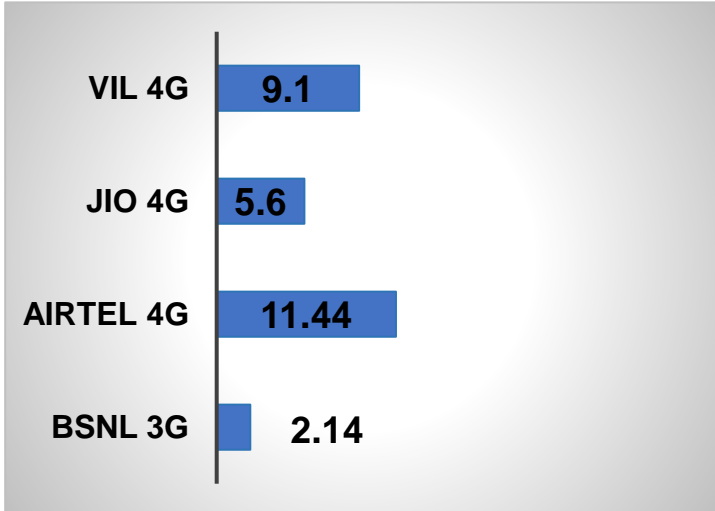
## Data Download and Upload Performance (Mbps)

3G/4G/ Network:

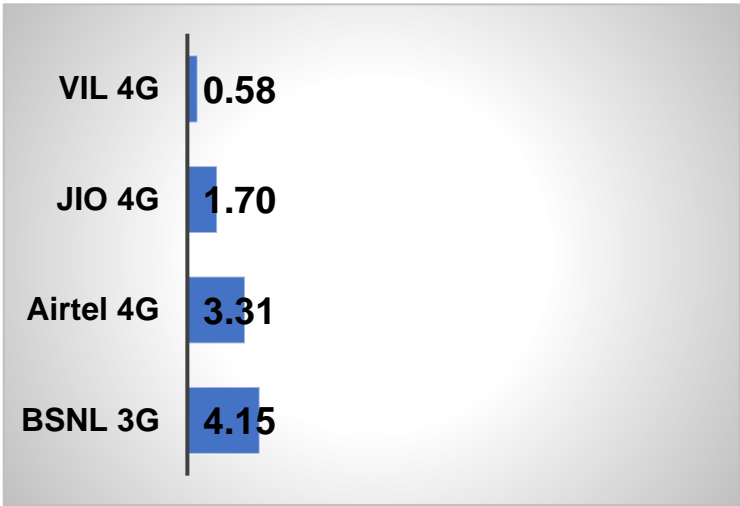
Download Throughput (Mbps)



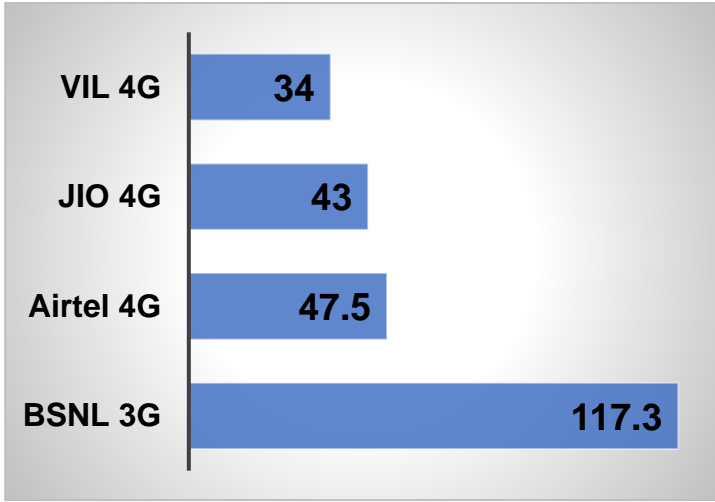
Upload Throughput (Mbps)



Web Browsing delay (Sec)



Latency (ms)



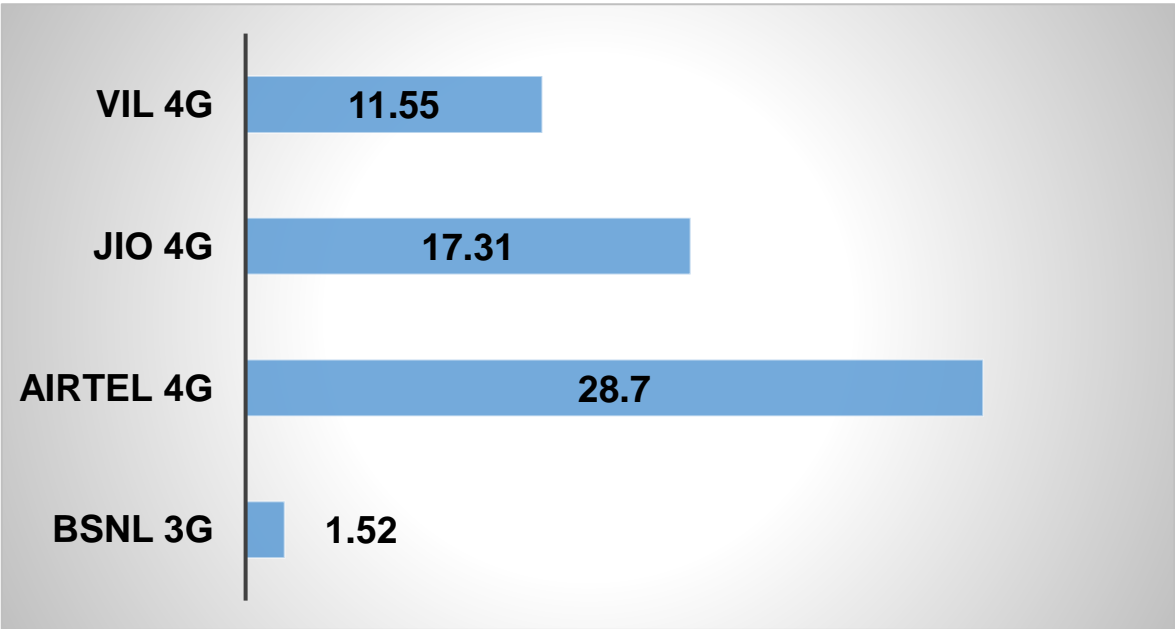
# Data Services Dynamic

Key  
Observations

Dynamic Data was tested, Download Throughput was tested.

Data Download Performance (kbps) - Dynamic

3G/4G/ Network:



Data Services Dynamic	3G / 4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download throughput in Mbps	1.52	28.70	17.31	11.55



# Summary

## SSA Level Summary-Voice

Voice Calls	2G		
	Airtel	BSNL	VIL
Call attempts	357	819	565
Block call rate %	0	1.03	0
CSSR %	100	99.32	100
Drop call rate %	0	1.11	0
Mobility HOSR %	100	97.43	98.70
RX Quality %	96.96	87.00	95.28

Voice Calls	3G	VoLTE		
TSP ( For 3G)	BSNL	Airtel	JIO	VIL
Call attempts	819	374	405	211
Block call rate %	1.17	0	0	0
CSSR %	99.32	100	100	100
Drop call rate %	1.35	0	0	0
Mobility HOSR %	96.47	100	99.73	100
RX Quality %	96.27	90.50	92.00	97.67

# Summary

## SSA Level Summary- (Average of 6 hotspots)- Data Services

Data Services Static	2G		
	Airtel	BSNL	VIL
Download throughput in Kbps	163.26	142.64	180.22
Upload Throughput in Kbps	71.11	109.21	90.21
Web browsing delay in second	19.91	67.43	0.62
Latency in (msec)	320.16	153.19	134

Data Services Static	3G / 4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download throughput in Mbps	4.68	36.92	33.85	15.70
Upload Throughput in Mbps	2.14	11.44	5.6	9.10
Web browsing delay in second	4.15	3.31	1.70	0.58
Latency in (msec)	117.3	47.5	43	34

Betnoti Railway Station	2G		
	Airtel	BSNL	VIL
Download Throughput (Mbps)	256.00	147.26	201.19
Upload Throughput (Mbps)	57.10	138.48	80.2
Web Browsing Delay (sec)	19.09	65.17	0.75
Latency (msec)	189	1235	130
Bangiriposhi Bus Stand	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	189.80	197.46	N.A
Upload Throughput (kbps)	116.20	158.15	N.A
Web Browsing Delay (sec)	17.78	89.92	N.A
Latency (msec)	193	1019	N.A
Udala Bus Stand	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	119.10	145.63	N.A
Upload Throughput (kbps)	48.910	96.25	N.A
Web Browsing Delay (sec)	26.66	67.68	N.A
Latency (msec)	431	527	N.A
Baripada Railway Station	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	130.90	189	178.21
Upload Throughput (kbps)	107.10	136	85.10
Web Browsing Delay (sec)	16.04	79.54	0.65
Latency (msec)	421	564	130
Maharaja Sriram Chandra Bhanja Deo university	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	154.90	142	187.11
Upload Throughput (kbps)	46.80	106	85.20
Web Browsing Delay (sec)	21.90	53.42	0.66
Latency (msec)	298	423	128
PRM Medical College Campus	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	128.90	122	191.40
Upload Throughput (kbps)	50.56	107	97.30
Web Browsing Delay (sec)	18.67	32.24	0.59
Latency (msec)	389	325.72	131

Betnoti Railway Station	3G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	4.14	58.43	30.3	N.A
Upload Throughput (Mbps)	1.68	17.57	6.9	N.A
Web Browsing Delay (sec)	3.46	2.65	2.2	N.A
Latency (msec)	75	42	32	N.A

Bangiriposhi Bus Stand	3G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	4.64	28.85	31.9	N.A
Upload Throughput (Mbps)	1.92	12.44	5.9	N.A
Web Browsing Delay (sec)	2.36	3.25	1.8	N.A
Latency (msec)	169	48	47	N.A

Udala Bus Stand	3G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	4.52	53.42	40.2	N.A
Upload Throughput (Mbps)	1.72	14.33	5.9	N.A
Web Browsing Delay (sec)	4.46	4.65	1.8	N.A
Latency (msec)	103	51	46	N.A

Baripada Railway Station	3G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	4.56	22.86	39.7	N.A
Upload Throughput (Mbps)	2.84	7.89	6.4	N.A
Web Browsing Delay (sec)	3.42	1.57	1.5	N.A
Latency (msec)	78	43	41	N.A

Maharaja Sriram Chandra Bhanja Deo university	3G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	3.12	40.36	35.3	N.A
Upload Throughput (Mbps)	1.69	9.67	5.5	N.A
Web Browsing Delay (sec)	15.47	2.12	1.6	N.A
Latency (msec)	99	55	45	N.A

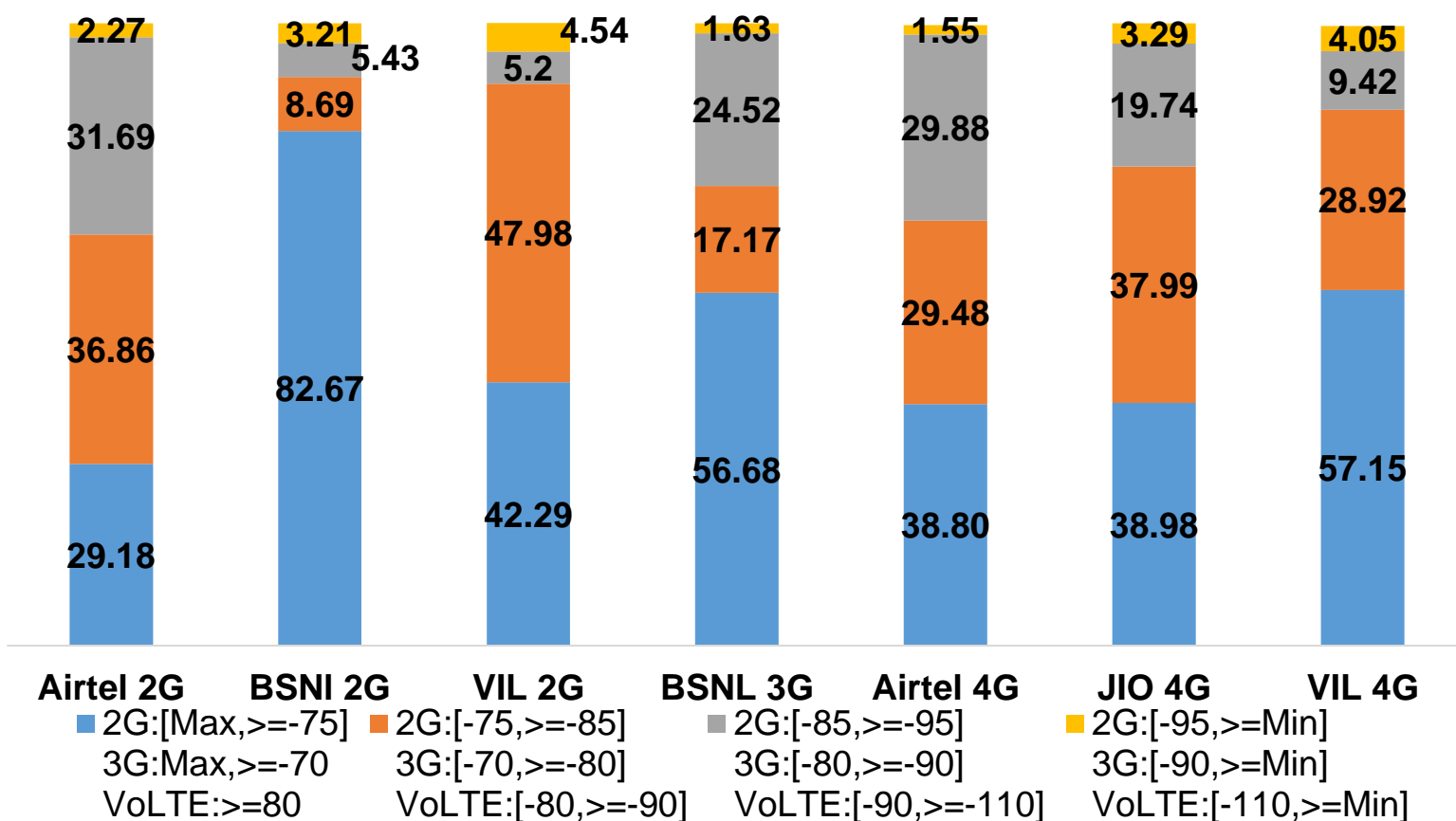
PRM Medical College Campus	3G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	4.23	17.64	25.5	N.A
Upload Throughput (Mbps)	2.18	6.78	2.7	N.A
Web Browsing Delay (sec)	5.64	5.67	1.7	N.A
Latency (msec)	83	46	49	N.A

## 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	66.04
BSNL 2G	91.36
VIL 2G	90.27
BSNL 3G	98.37
Airtel VoLTE	95.58
JIO VoLTE	96.71
VIL VoLTE	95.49

### Coverage Details

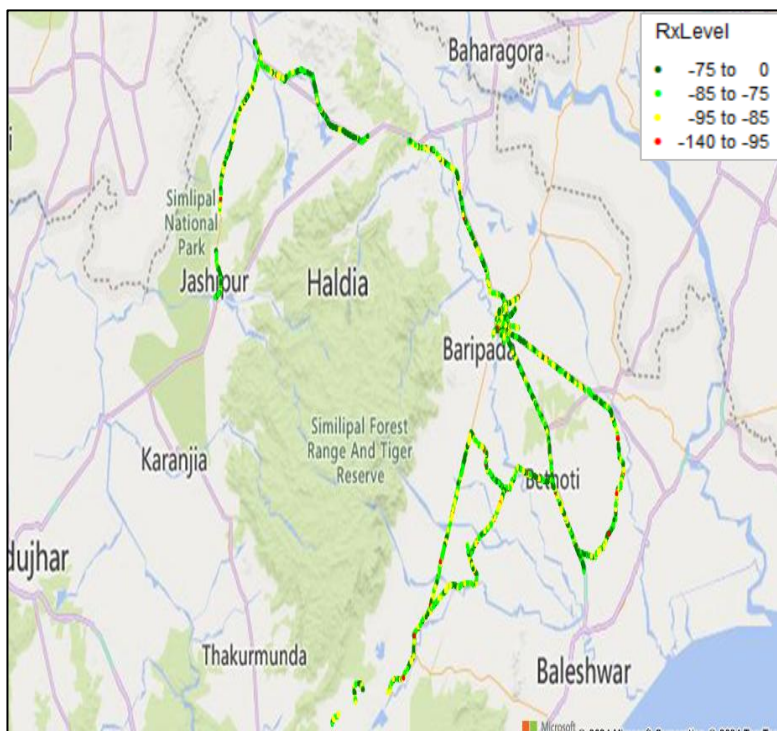


# I. Coverage Details

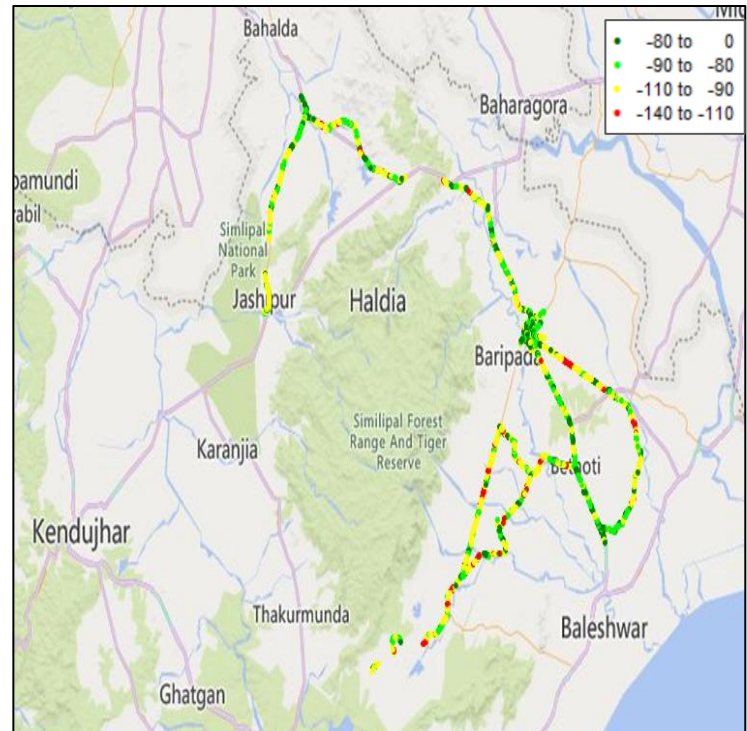
## AIRTEL

Technology	Coverage Rate %
2G	66.04
VoLTE	95.58

### 2G



### VoLTE



### 2G

Overall RxLevel	# Samples	%
[Max, >=-75]	1534584	29.18
[-75, >=-85]	1938355	36.86
[-85, >=-95]	1666456	31.69
[-95, >=Min]	119297	2.27
<b>Total</b>	<b>5903624</b>	<b>100</b>

### VoLTE

Overall RSRP	# Samples	%
[Max, >=-80]	1515955	20.57
[-80, >=-90]	2485710	33.72
[-90, >=-110]	3044052	41.29
[-110, >=Min)	325911	4.42
<b>Total</b>	<b>7371628</b>	<b>100</b>

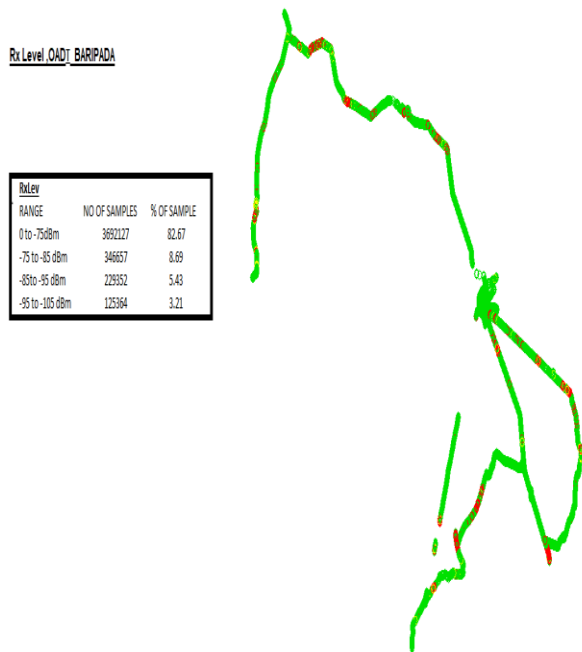


# I. Coverage Details

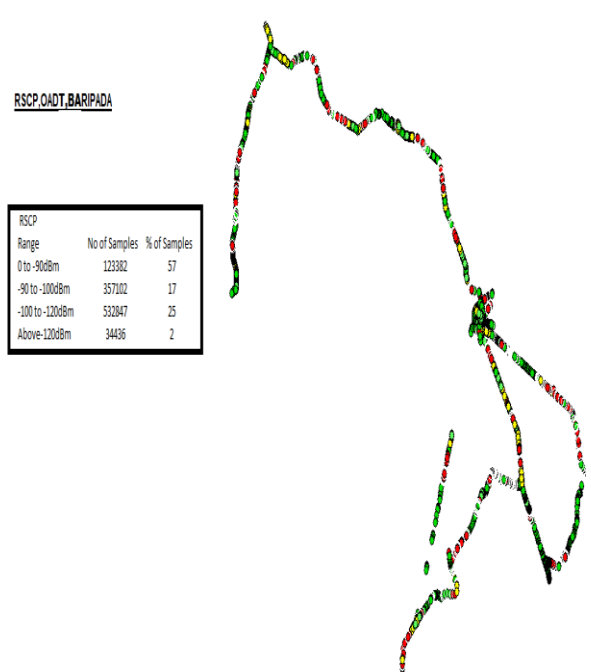
## BSNL

Technology	Coverage Rate %
2G	91.36
3G	98.37

### 2G



### 3G



### 2G

Overall RxLevel	# Samples	%
[Max, >=-75]	3692127	82.67
[-75, >=-85)	346657	8.69
[-85, >=-95)	229352	5.43
[-95, >=Min)	125364	3.21
Total	1063500	100

### 3G

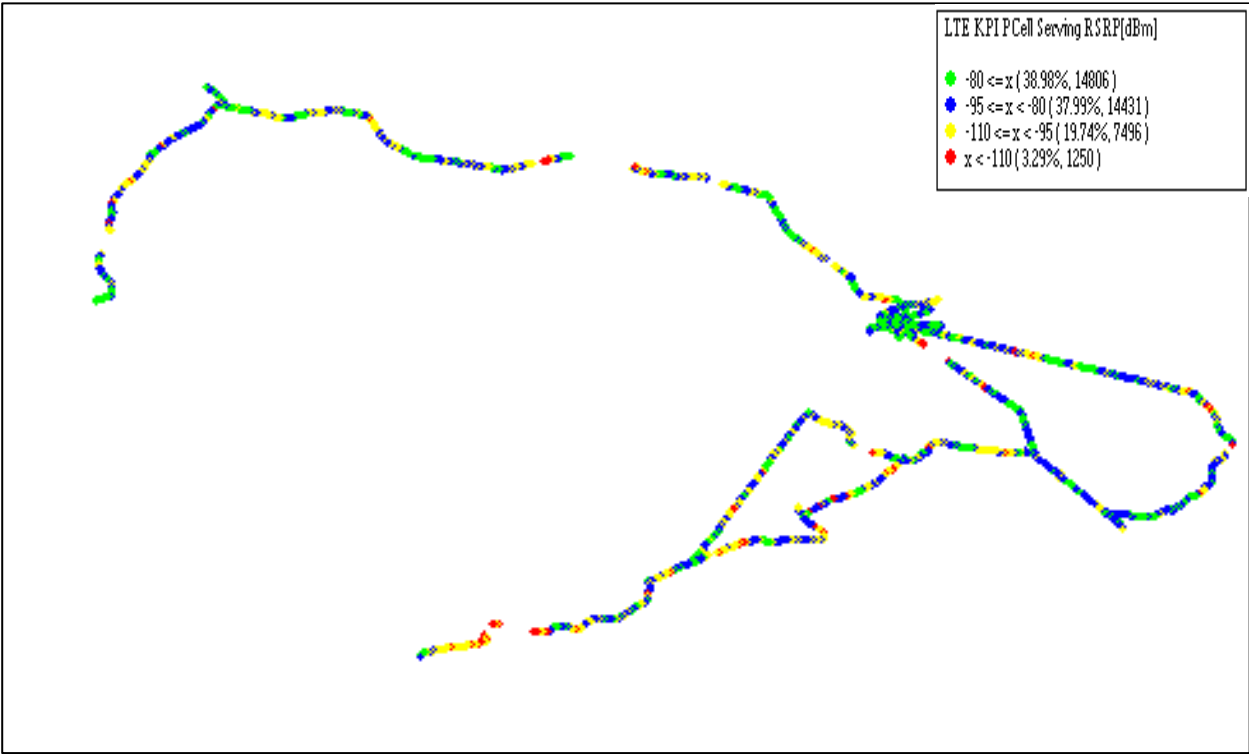
Overall RxLevel	# Samples	%
[Max, >=-70]	123382	56.68
[-70, >=-80)	357102	17.17
[-80, >=-90)	532847	24.52
[-90, >=Min)	34436	1.63
Total	1047767	100

## I. Coverage Details

## JIO

Technology	Coverage Rate %
VoLTE	96.71

## VoLTE



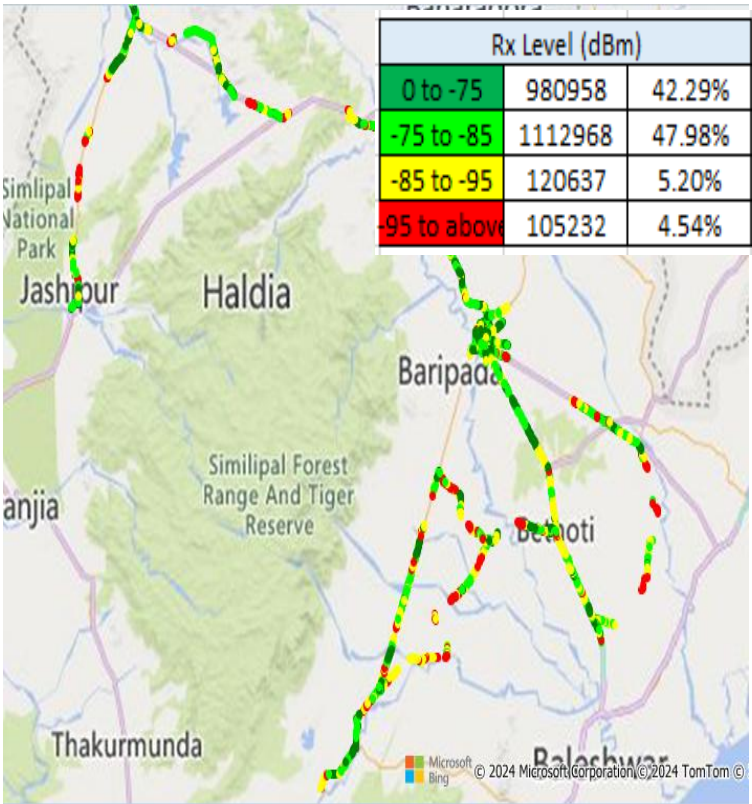
VoLTE		
Overall RSRP	# Samples	%
[Max, >=-80]	14806	38.98
[-80, >=-90]	14431	37.99
[-90, >=-110]	7496	19.74
[-110, >=Min]	1250	3.29
Total	37983	100

# I. Coverage Details

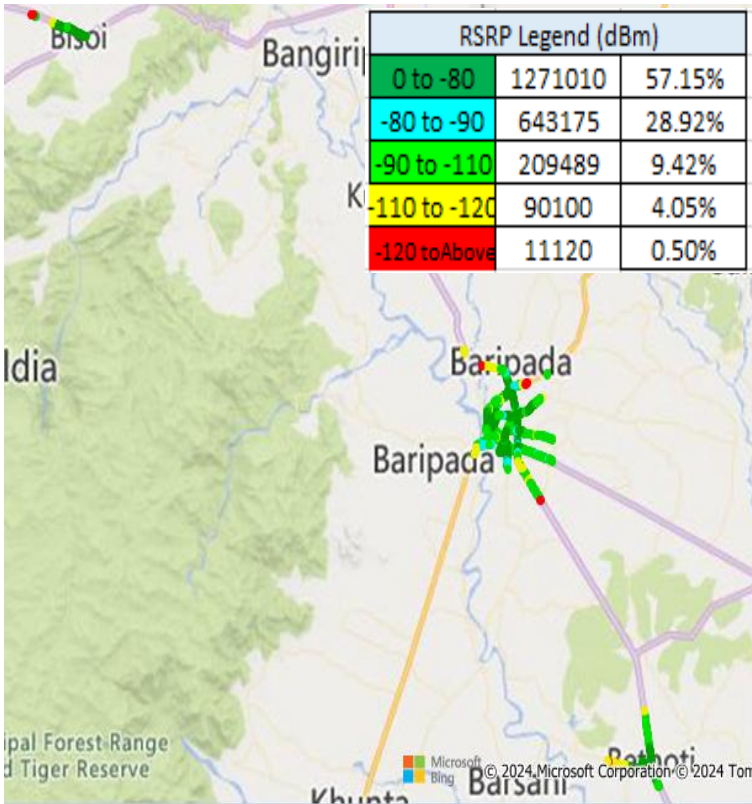
## VIL

Technology	Coverage Rate %
2G	90.27
VoLTE	95.49

### 2G



### VoLTE



### 2G

Overall RxLevel	# Samples	%
[Max, >=-75]	9099829	42.29
[-75, >=-85]	10230954	47.98
[-85, >=-95]	843231	5.20
[-95, >=Min]	474967	4.54
Total	20648981	100

### VoLTE

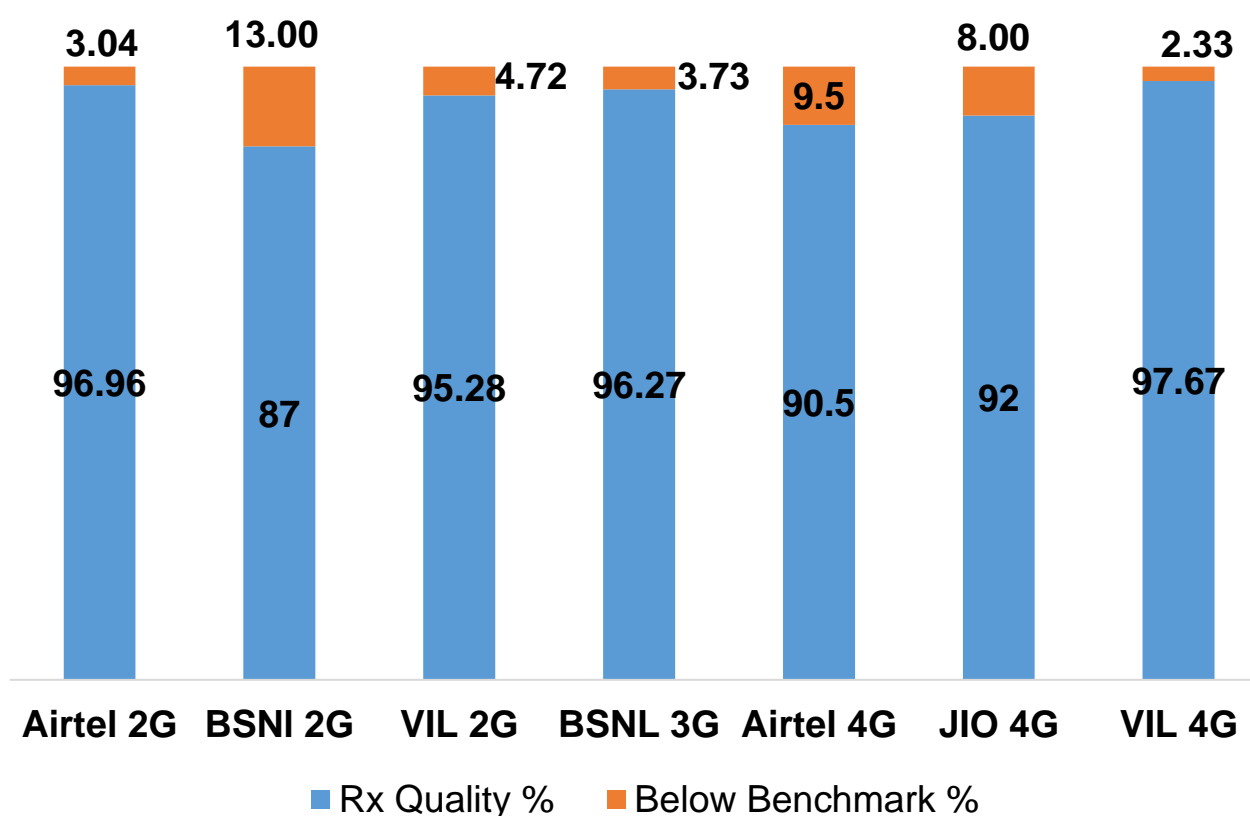
Overall RSRP	# Samples	%
[Max, >=-80]	1271010	57.15
[-80, >=-90]	643175	28.92
[-90, >=-110]	209489	9.42
[-110, >=-120]	90100	4.05
[-120, >=Min]	11120	0.50
Total	2224894	100

## II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Qual  $\leq 5$  for GSM TSPs, EcNo  $\geq -14$  dBm for 3G TSP 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	96.96
BSNL 2G	87.00
VIL 2G	95.28
BSNL 3G	96.27
Airtel 4G	90.50
JIO 4G	92.00
VIL 4G	97.67

**RX Quality Distribution**

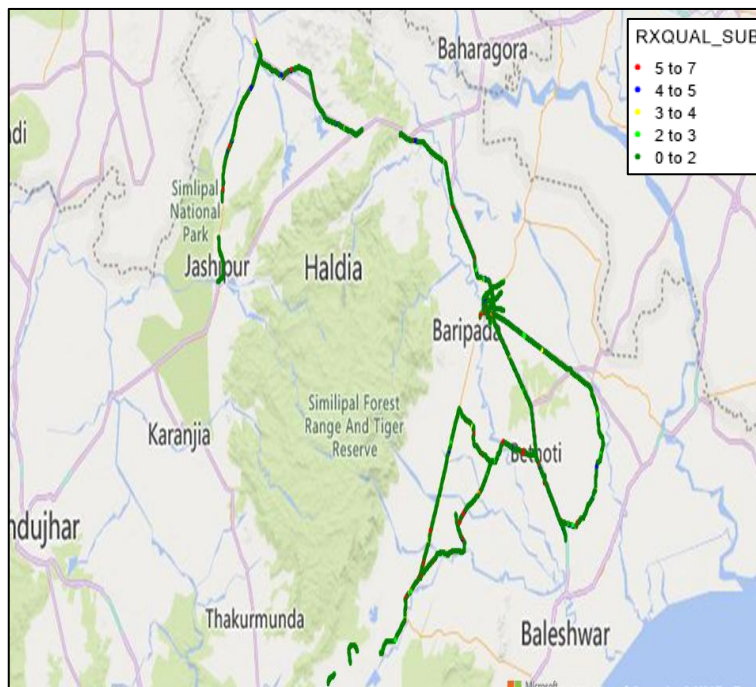


## II. Quality Details

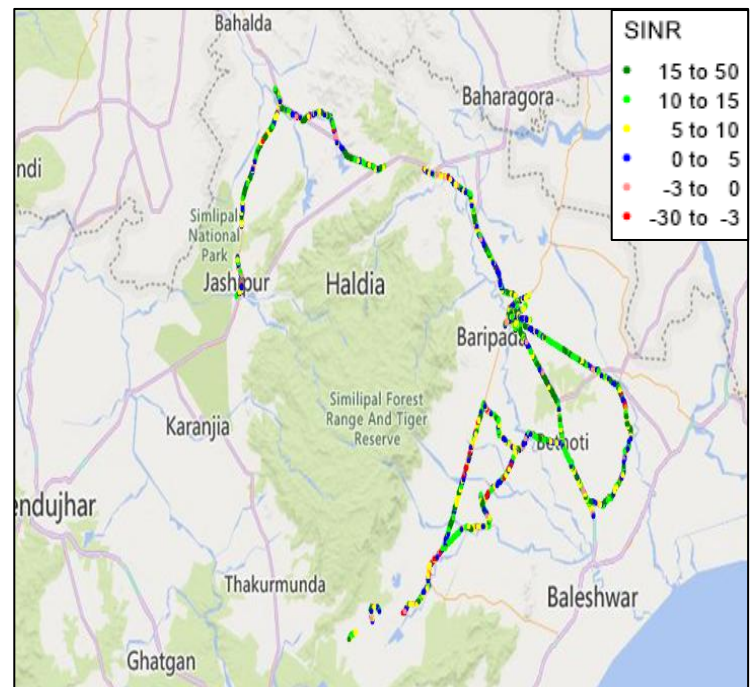
### Airtel

Technology	Rx Quality %
2G	96.96
VoLTE	90.50

#### 2G



#### VoLTE



Overall Rx Quality	# Samples	%
(Min, <=2)	4838047	92.00
(2, <=3)	90887	1.73
(3 , <=4)	93204	1.76
(4 , <=5)	77422	1.47
(5 , <=Max)	159132	3.03
<b>Total</b>	<b>5258692</b>	<b>100</b>

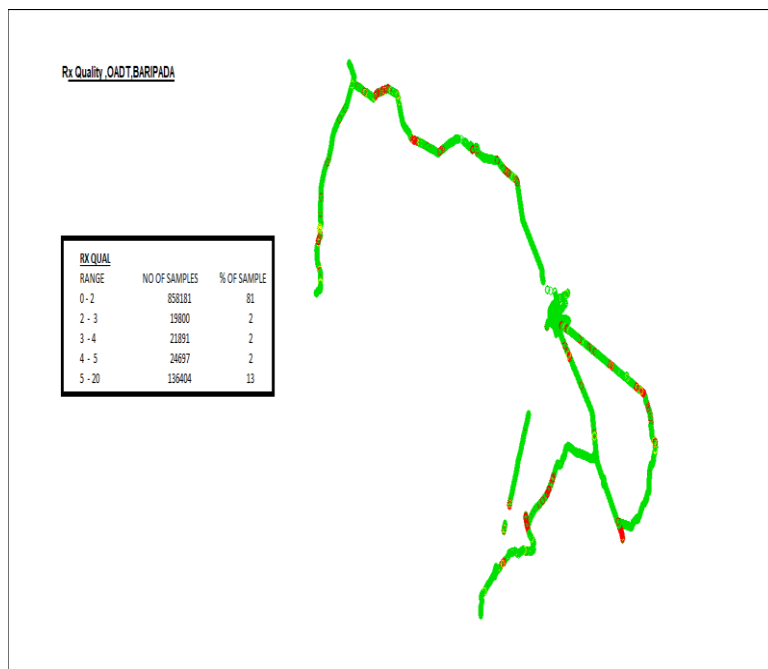
Overall SINR	# Samples	%
(Min, <=-3)	232763	3.16
(-3, <=0)	467509	6.34
(0, <=5)	1609253	21.83
(5, <=10)	1928075	26.16
(10, <=15)	1589343	21.56
(15, <=Max)	1544685	20.95
<b>Total</b>	<b>7371628</b>	<b>100</b>

## II. Quality Details

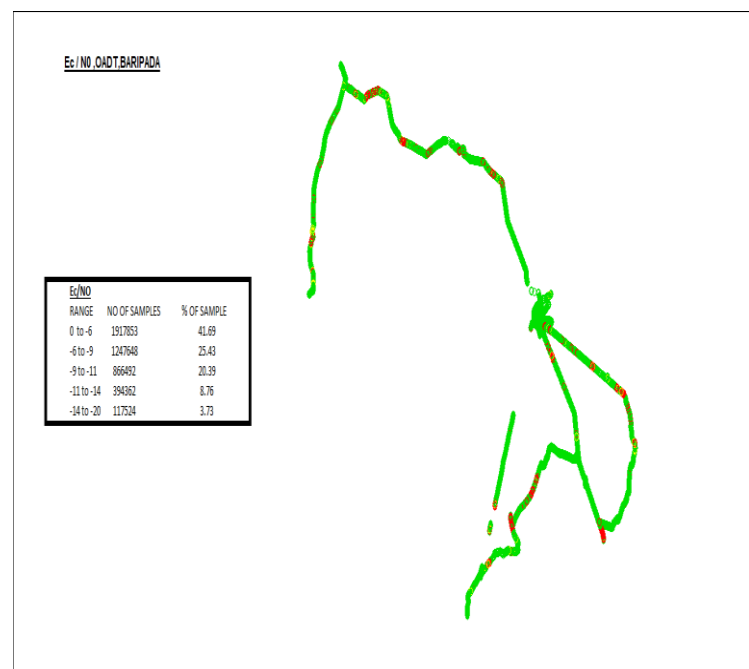
### BSNL

Technology	Rx Quality %
BSNL 2G	87.00
BSNL 3G	96.27

### 2G



### 3G



2G		
Overall Rx Quality	# Samples	%
(Min, <=2)	858181	81.00
(2 , <=3)	19800	2.00
(3 , <=4)	21891	2.00
(4, <=5)	24697	2.00
(5 , <=Max)	136404	13.00
<b>Total</b>	<b>1060973</b>	<b>100</b>

3G		
Overall EcNo	# Samples	%
(Max, <=-6)	1917853	41.69
(-6, <=-9)	1247648	25.43
(-9, <=-11)	866492	20.39
(-11, <=-14)	394362	8.76
(-14, <= Min)	117524	3.73
<b>Total</b>	<b>4543879</b>	<b>100</b>

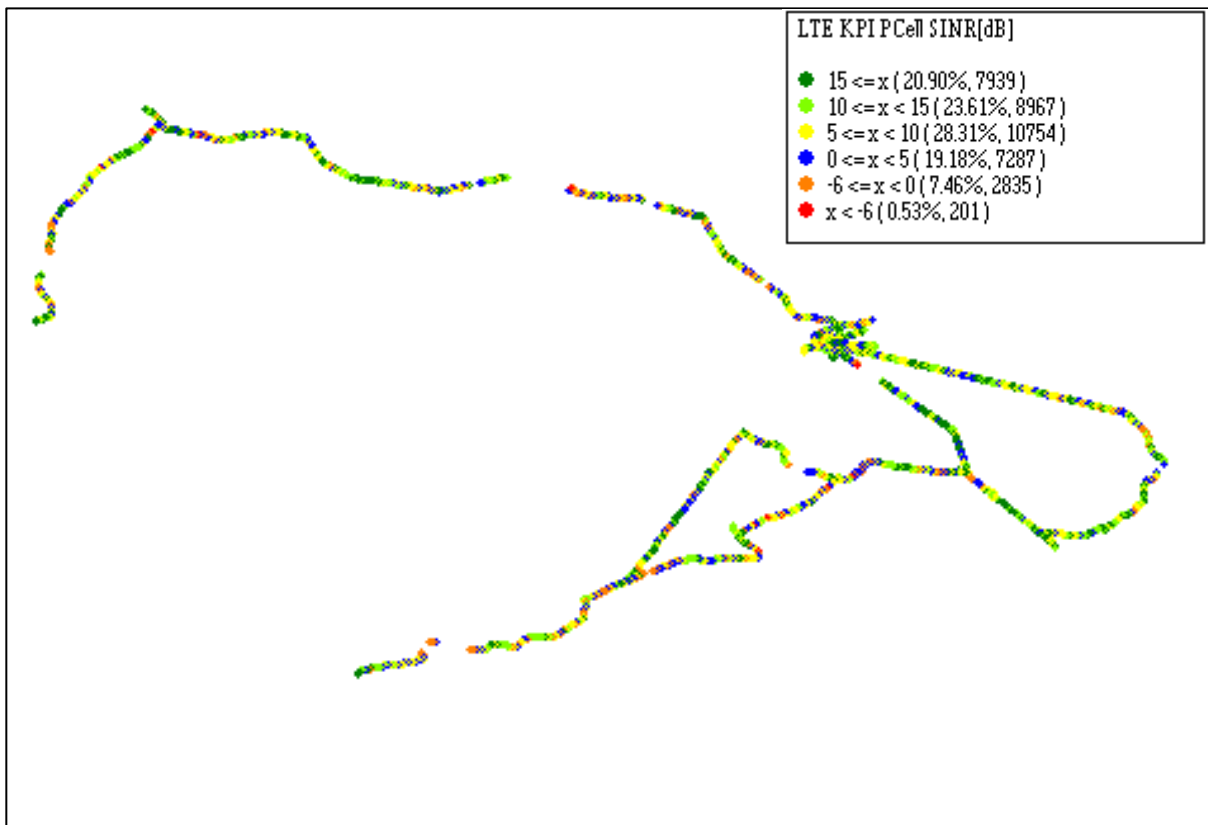


## II. Quality Details

JIO

Technology	Rx Quality %
VoLTE	92.00

VoLTE



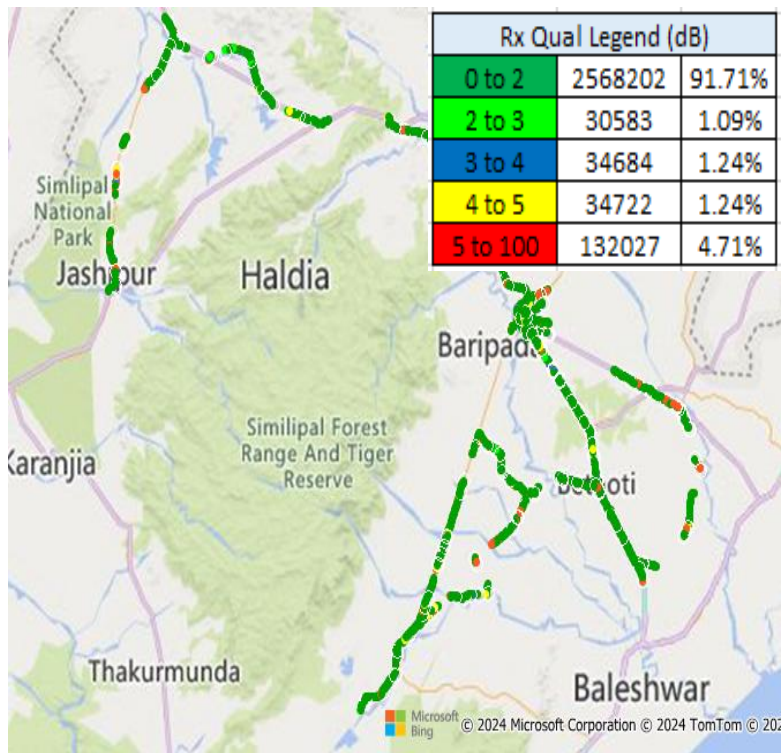
Overall SINR	# Samples	%
(Min, ≤-6)	201	0.53
(-6, ≤0)	2835	7.47
(0, ≤5)	7287	19.18
(5, ≤10)	10754	28.31
(10, ≤15)	8967	23.61
(15, ≤Max)	7939	20.90
<b>Total</b>	<b>37983</b>	<b>100%</b>

## II. Quality Details

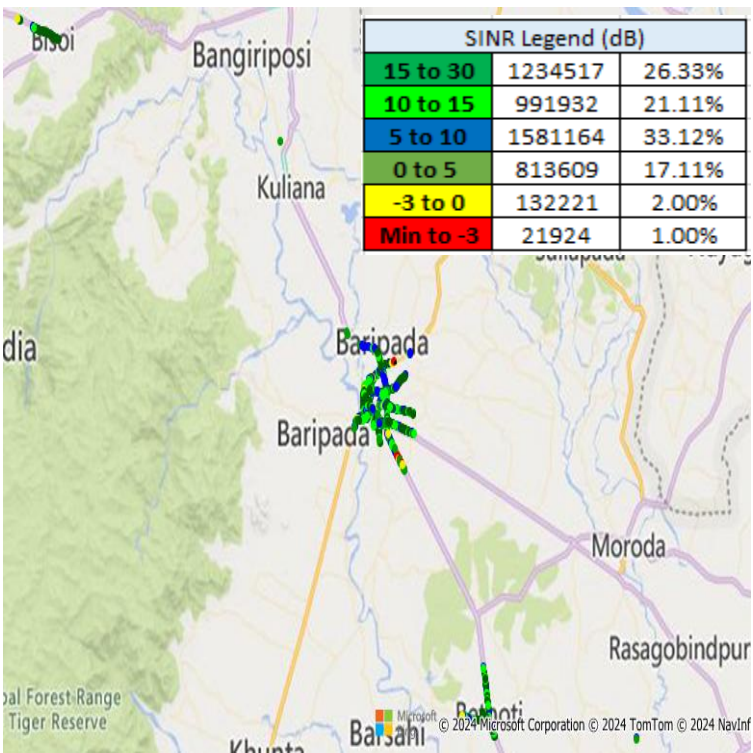
### VIL

Technology	Rx Quality %
2G	95.28
VoLTE	97.67

### 2G



### VoLTE

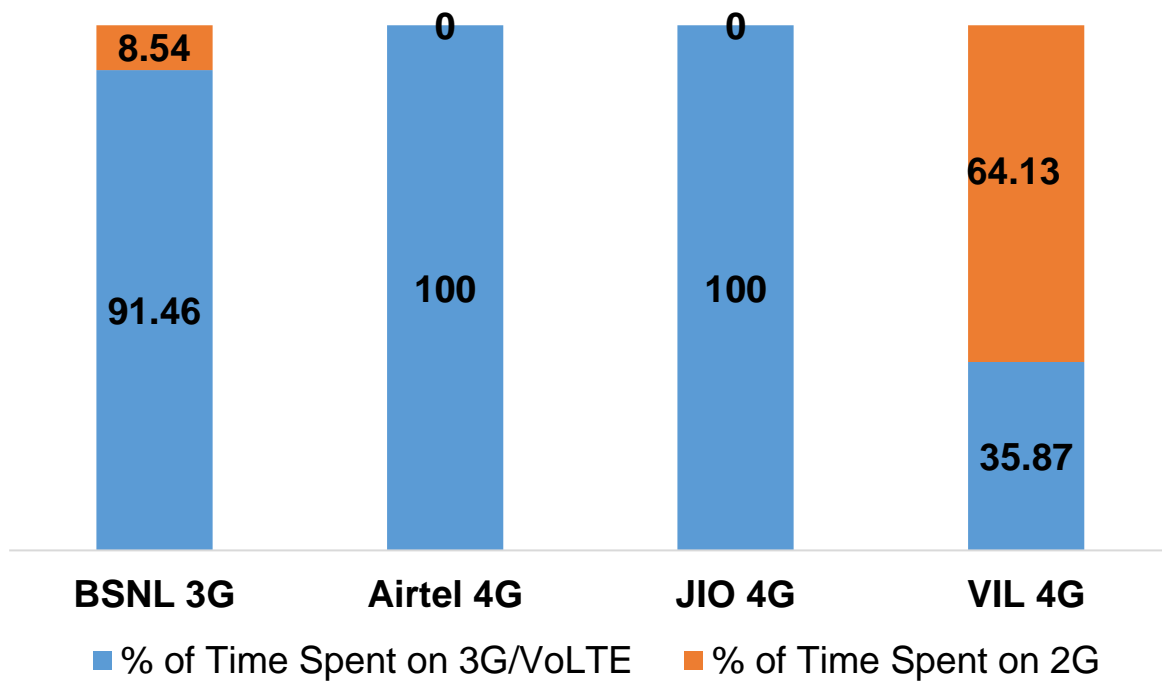


Overall Rx Quality	# Samples	%
(Min, <=2)	2568202	91.71
(2, <=3)	30583	1.09
(3 , <=4)	34684	1.24
(4 , <=5)	34722	1.24
(5 , <=Max)	132027	4.71
Total	2800218	100

Overall SINR	# Samples	%
(Min, <=-3)	21924	1.00
(-3, <=0)	1322221	2.00
(0, <=5)	813609	17.11
(5, <=10)	1581164	33.12
(10, <=15)	991932	21.11
(15, <=Max)	1234517	26.33
Total	4775367	100

### III. Technology Details

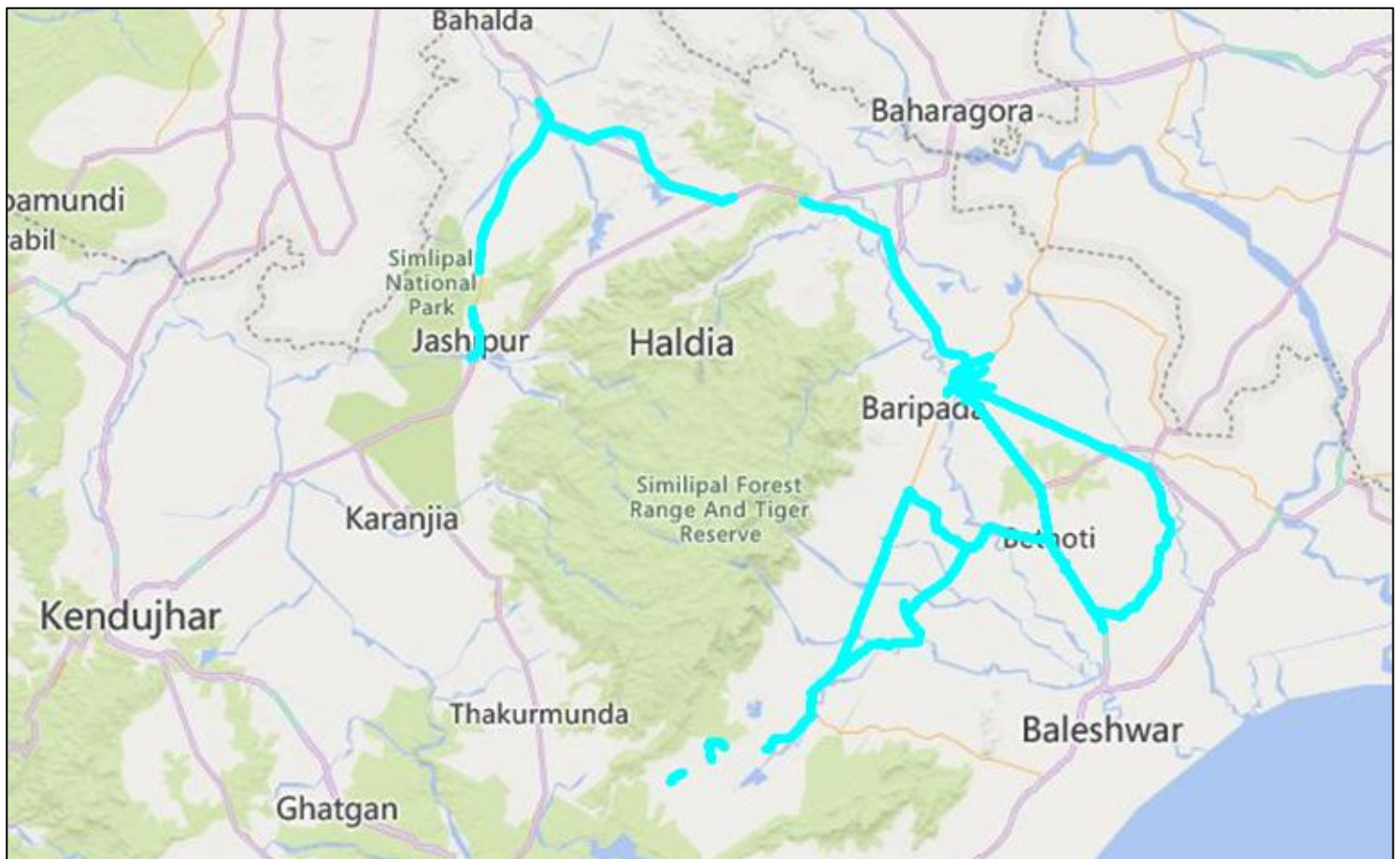
TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	91.46
Airtel VoLTE	100
JIO VoLTE	100
VIL VoLTE	35.87



### III. Technology Details

#### Airtel

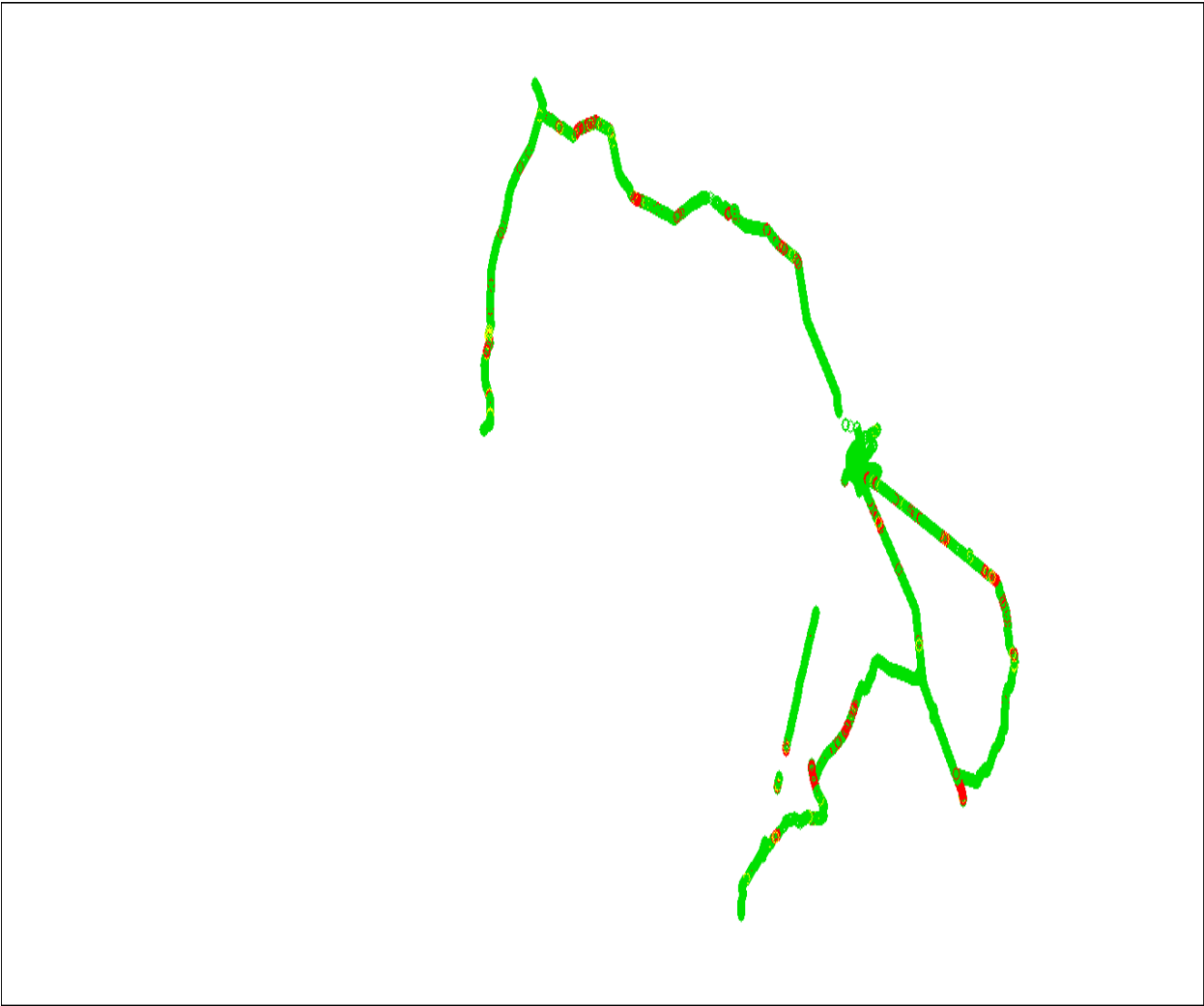
Technology	Time Spent %
3G / VoLTE	100



### III. Technology Details

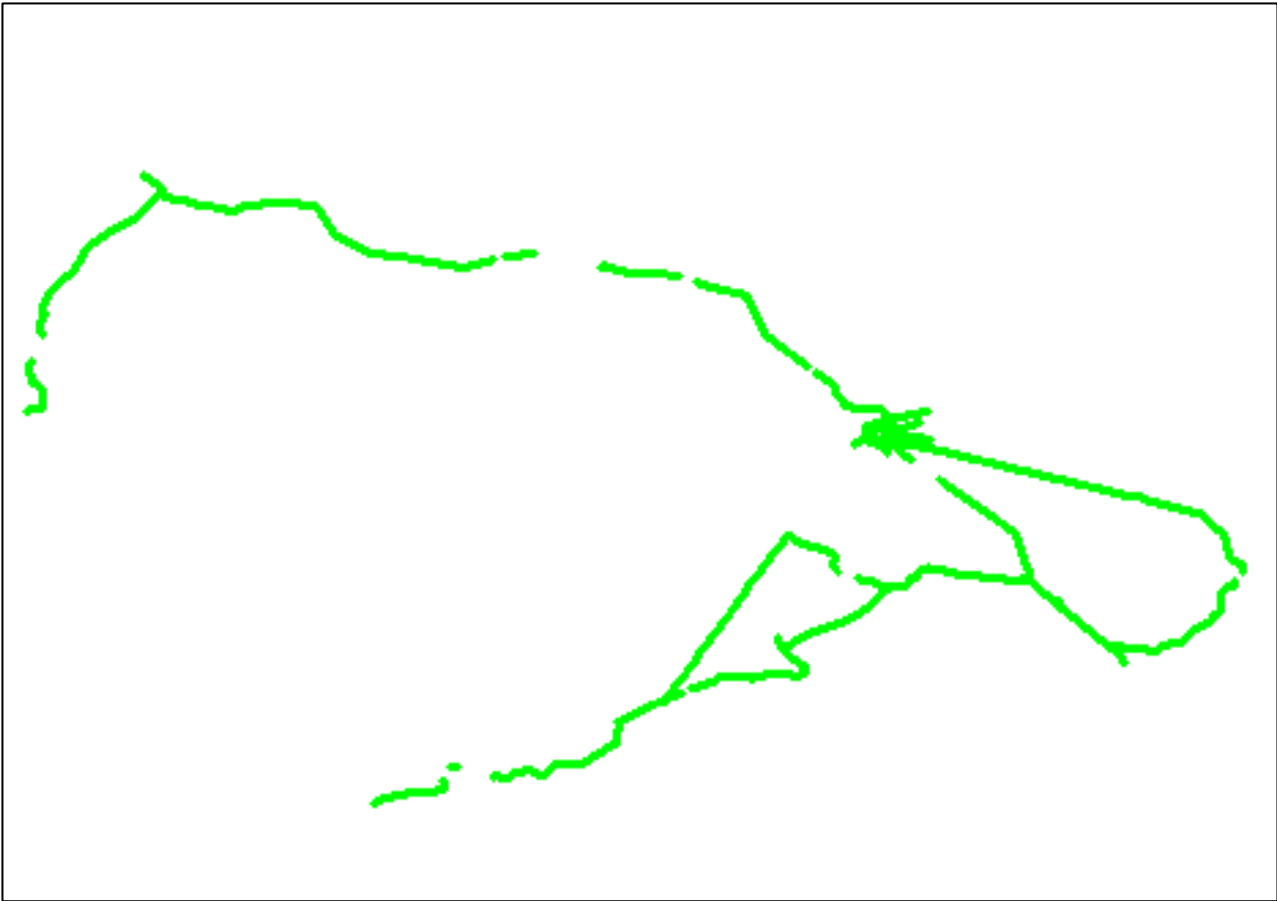
#### BSNL

Technology	Time Spent on 3G
3G	91.46



JIO

Technology	Time Spent %
3G / VoLTE	100

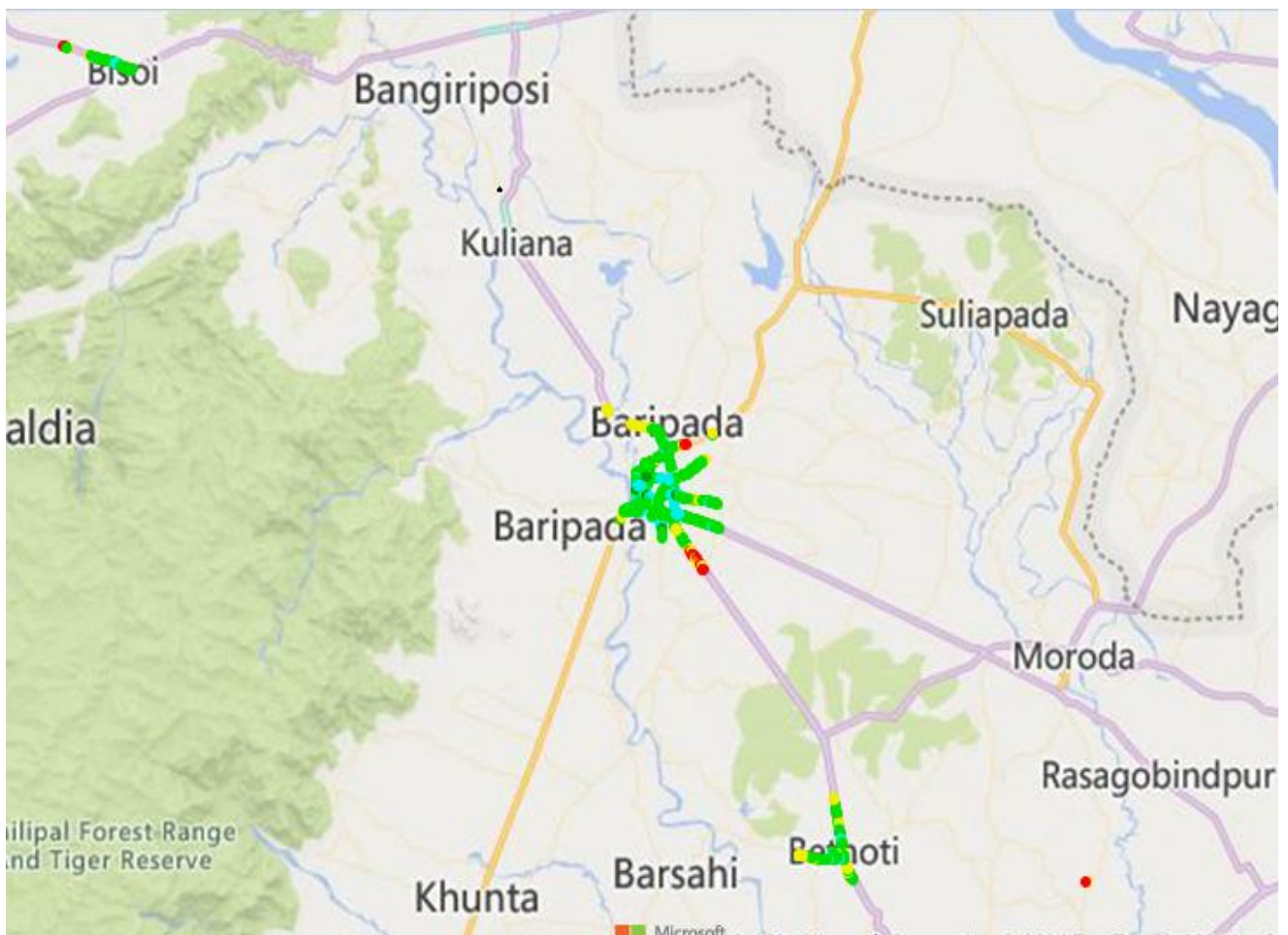




### III. Technology Details

#### VIL

Technology	Time Spent %
3G / VoLTE	35.87

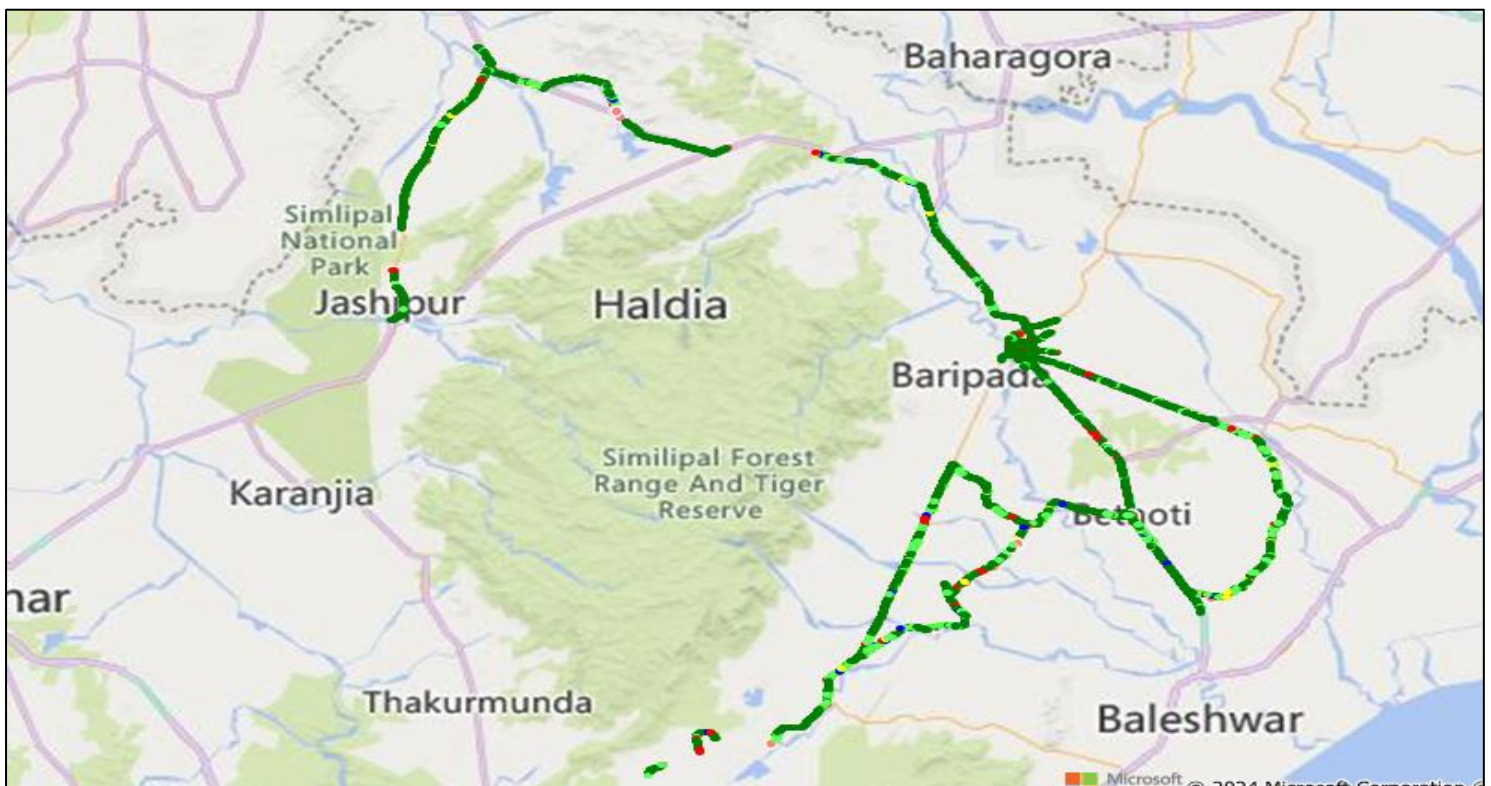


## IV. Dynamic Data Test- 3G / 4G DL Details

### Airtel

#### Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	3G / 4G
Download Throughput (Mbps)	28.70



DL throughput	No of Sample	%
0 to 1 Mbps	179712	1.65
1 to 2 Mbps	87764	0.81
2 to 3 Mbps	138566	1.27
3 to 4 Mbps	176843	1.63
4 to 8 Mbps	812455	7.47
8 to 12 Mbps	842654	7.75
>12 Mbps	8640086	79.43
Total	10878080	100

IV. Dynamic Data Test-  
3G DL Details

BSNL

Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	3G
Download Throughput (Mbps)	1.52



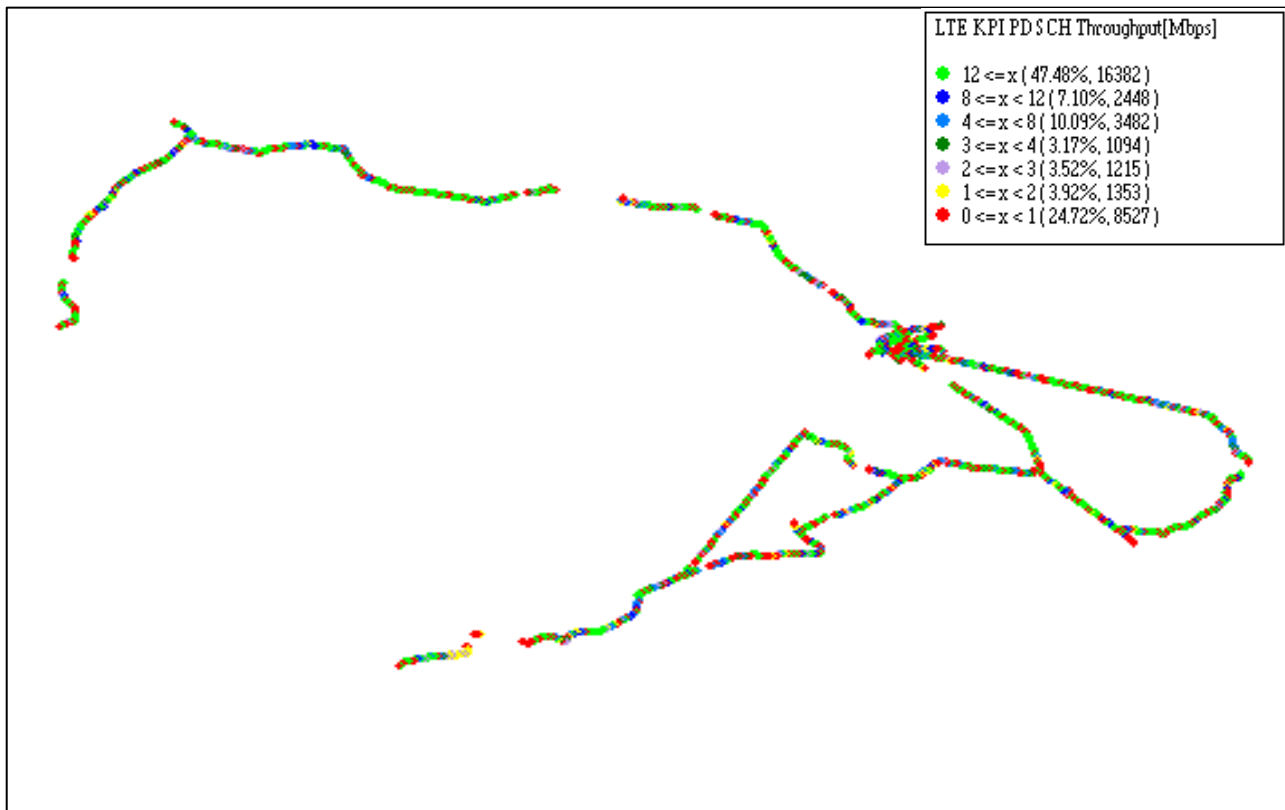
DL throughput	No of Samples	%
0 to 1 Mbps	1275	58.64
1 to 2 Mbps	898.75	41.36
2 to 3 Mbps	0	0
3 to 4 Mbps	0	0
4 to 8 Mbps	0	0
8 to 12 Mbps	0	0
>12 Mbps	0	0

## IV. Dynamic Data Test- 3G / 4G DL Details

**JIO**

### Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	3G / 4G
Download Throughput (Mbps)	17.31

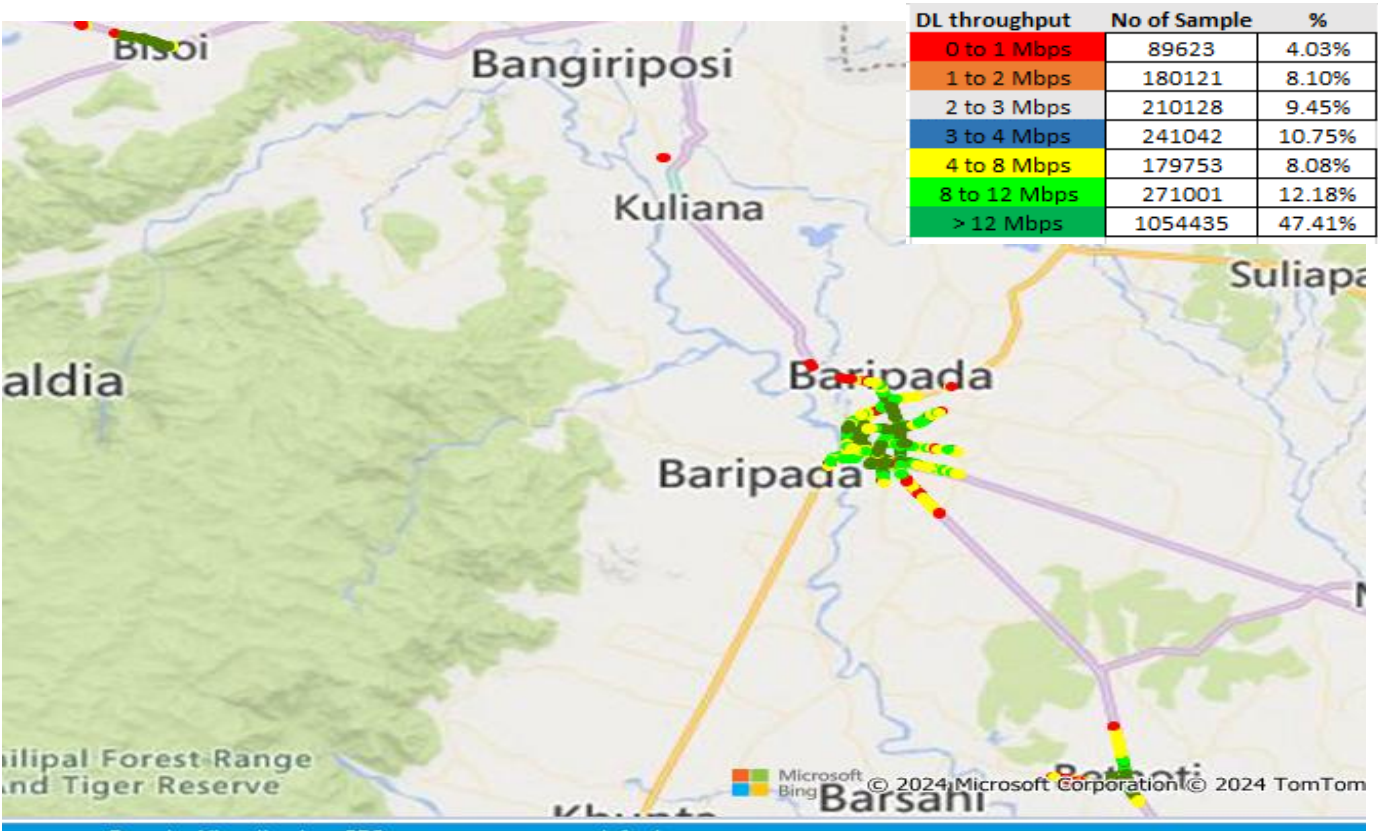


DL Throughput	No of Sample	%
0 to 1 Mbps	8527	24.72
1 to 2 Mbps	1352	3.92
2 to 3 Mbps	1215	3.52
3 to 4 Mbps	1094	3.17
4 to 8 Mbps	3482	10.09
8 to 12 Mbps	2448	7.10
>12 Mbps	16382	47.48

VIL

Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	3G / 4G
Download Throughput (Mbps)	11.55



DL throughput	No of Sample	%
0 to 1 Mbps	92832	6.09
1 to 2 Mbps	120023	7.88
2 to 3 Mbps	100399	6.59
3 to 4 Mbps	184762	12.12
4 to 8 Mbps	83763	5.50
8 to 12 Mbps	193733	12.71
>12 Mbps	748364	49.11
Total	1523876	100



## Airtel

Technology 4G	1. Betnoti railway station	2. Bangiriposhi bus stand	3. Udala bus stand	4. Baripada Railway station	5. Maharaja sriram chandra bhanjadeo university	6. PRM Medical college Campus Rangamatia
Download in Mbps	70.30	38.91	56.93	130.11	104.74	128.04
Upload in Mbps	38.31	13.31	32.77	9.84	14.86	27.10

## BSNL

Technology 4G	1. Betnoti railway station	2. Bangiriposhi bus stand	3. Udala bus stand	4. Baripada Railway station	5. Maharaja sriram chandra bhanjadeo university	6. PRM Medical college Campus Rangamatia
Download in Mbps	4.14	4.64	4.52	4.23	5.56	NA
Upload in Mbps	1.68	1.92	1.72	2.18	2.84	NA

## JIO

Technology 4G	1. Betnoti railway station	2. Bangiriposhi bus stand	3. Udala bus stand	4. Baripada Railway station	5. Maharaja sriram chandra bhanjadeo university	6. PRM Medical college Campus Rangamatia
Download in Mbps	46.05	116.94	90.61	71.5	53.96	76.5
Upload in Mbps	16.01	31.31	19.95	15.39	57.03	59.63

## VIL

Technology 4G	1. Betnoti railway station	2. Bangiriposhi bus stand	3. Udala bus stand	4. Baripada Railway station	5. Maharaja sriram chandra bhanjadeo university	6. PRM Medical college Campus Rangamatia
Download in Mbps	16.63	NA	NA	15.73	15.52	10.32
Upload in Mbps	15.18	NA	NA	7.50	12.66	5.35



## VI. NH/SH Routes covered

### NH/SH Routes covered in OADT by Airtel / BSNL / RJIL / VIL

S.No	No of NH/SH routes	NH routes	SH routes	Distance (Km)
1				
2				
3				
4				
5				
6				
7				