



# Operator Assisted Drive Test Report

## Jaipur (Raj)-Sohna (Haryana) Highway

16 Feb-2024

by

TRAI Regional office Jaipur

**Key Performance Indicators:** All TSPs have met the Drop Call Rate (DCR) benchmark of 2% except. All TSPs have met the Call Setup Success Rate (CSSR) of 95%.

The Operator Assisted Drive Test has been carried out by Regional Office, Jaipur with the help of Service Providers in Jaipur-Sohna Expressway on 16-Feb. The drive test covered drive route of 190 KMs. 140 calls were made for each of the 2G/4G networks: three 2G networks, one 3G networks and three LTE networks covering four TSPs.

Overview

Voice  
Summary

Data  
Summary

# Overview

Regional Office, TRAI Jaipur conducted Operator Assisted Drive Test from 16<sup>th</sup> Feb 2024 covering Jaipur and surrounding areas. The performance of Airtel, BSNL, Vodafone Idea and Jio was 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.

**Voice:** Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

**Data:** Download Throughputs,  
**Drive Test Details :**

**Voice Tests:** Calls were made for 90 sec duration with a wait time of 10 sec between calls in all technologies. The drive test covered a drive route of 190 KMs. 140 calls were made for each of the TSPs networks: three 2G (Lock Mode) networks, one 3G (Dual mode) networks and three VoLTE networks covering 4 unique TSPs.

## Data Tests:

**Dynamic data test** was conducted for ..... kms for download throughput in all technologies.

2G – measurement – UE Locked in 2G file size- 500KB

3G – measurement – UE in 3G File Size- 20MB

4G – measurement – UE in LTE File Size- 40MB

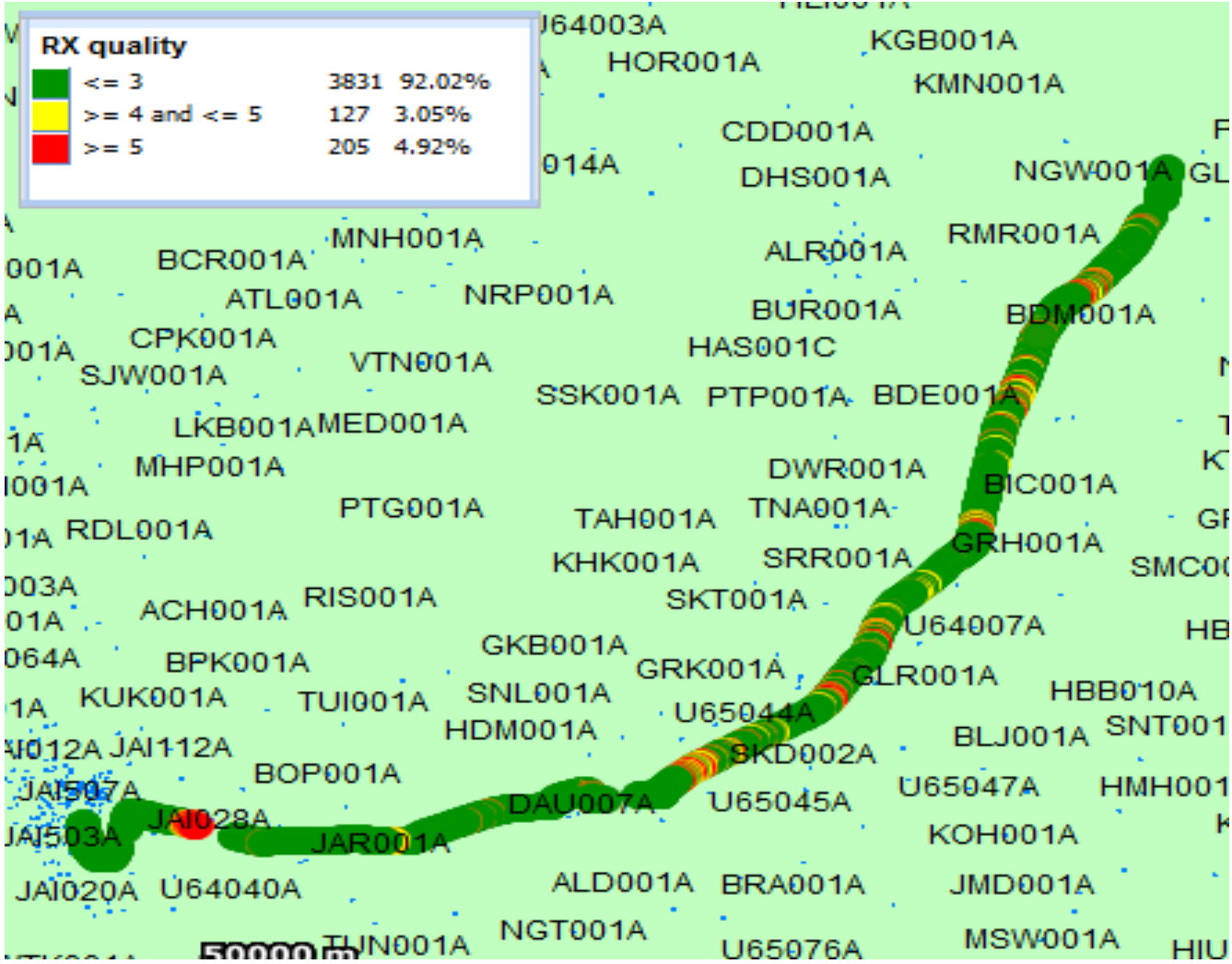
## Static data tests on 5- 6 hotspots

1.

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 <a href="http://www.amazon.in">www.amazon.in</a> , <a href="http://www.flipkart.com">www.flipkart.com</a> and PayTm
Latency	32 Bytes on <a href="http://www.google.com">www.google.com</a>

# Overview

## Voice & Dynamic Data Test Drive Route

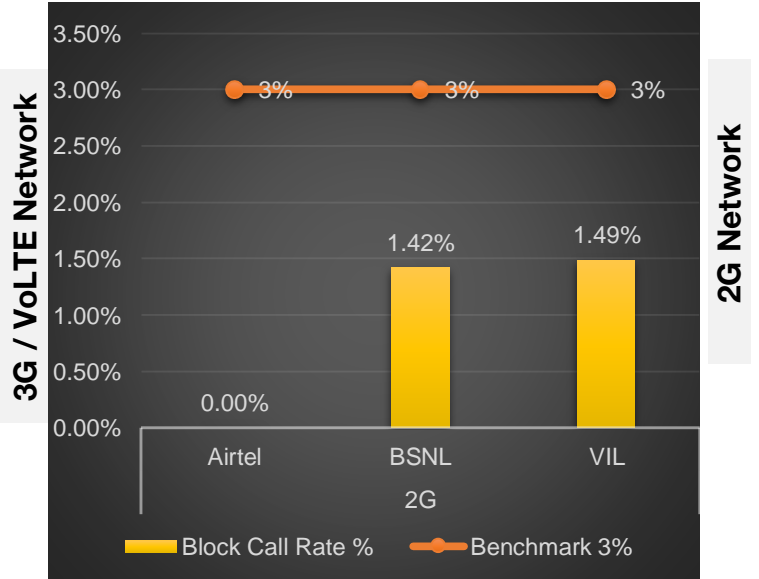
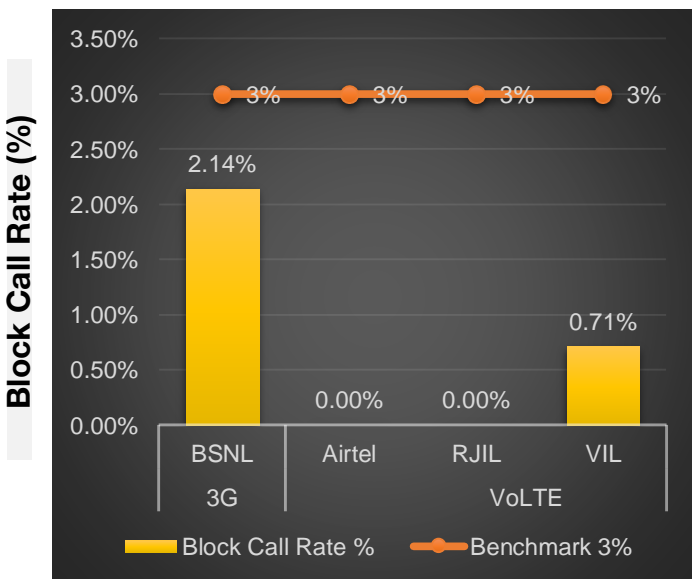
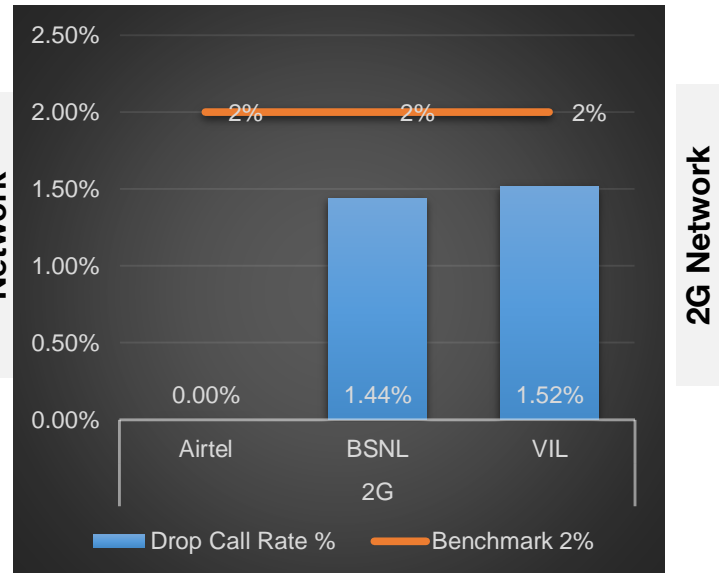
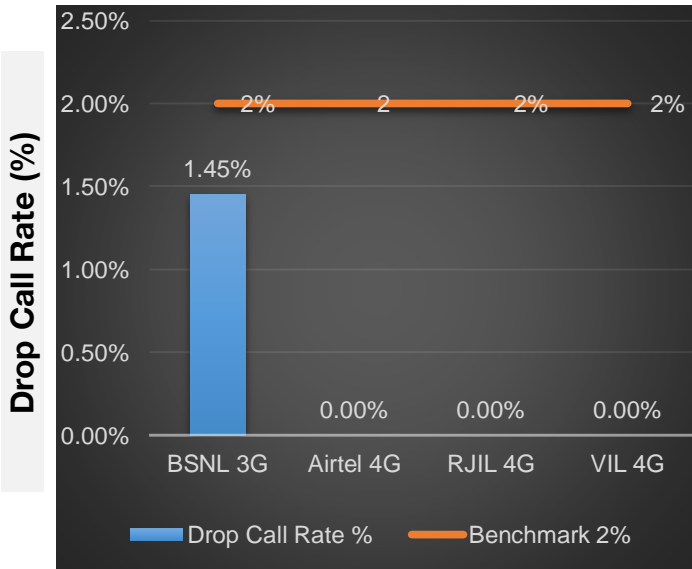


Date	Test Scenario	Area to be Covered
16.02.20 24	2G/3G/4G Voice and 3G/4G Dynamic Data	Jaipur-Sohna Highway

# Voice Calls

## Key Observations

**QoS compliance** of the TSPs on Jaipur To Gurugram Highway for Voice across technologies 2G/3G/4G-VoLTE:



KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0.00%	1.44	1.52	1.45	0.00%	0.00%	0
Block Call Rate %	0.00%	1.42	1.49	2.14	0.00%	0.00%	0.71

- 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 %	90.33%	46.44%	68.9%

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

TSPs	3G
	BSNL
Coverage %	47.01%

c) Percentage of coverage samples for LTE  $\geq$  -110 dBm.

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	99.58%	99.08%	88.65%

d) Percentage of time spent on 3G/4G network

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	18.24%	100.00%	100.00%	99.99%

# Data Services Dynamic

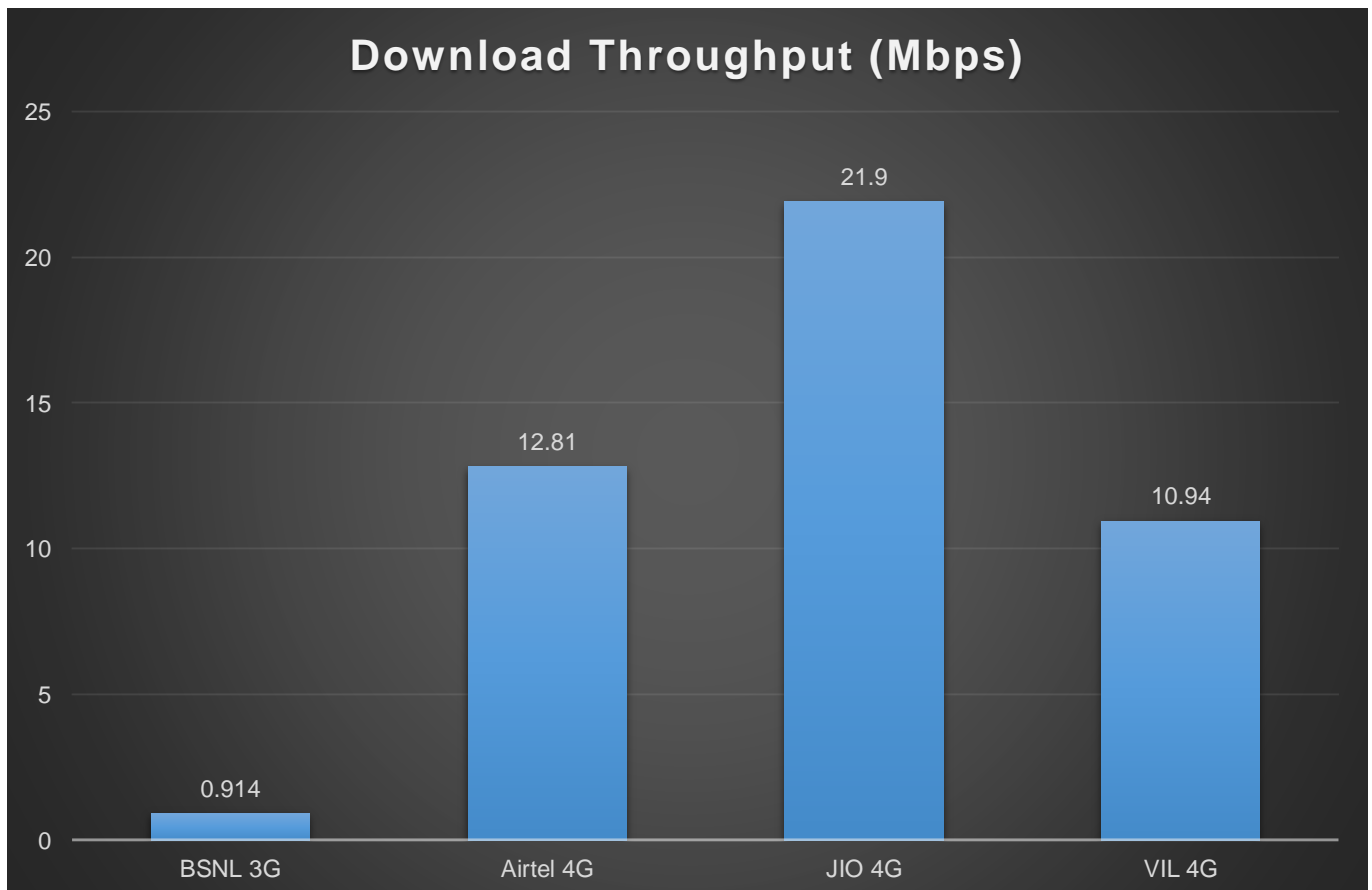
**Key Observations**

Dynamic Data was tested for whole voice route. Download Throughput was tested.

## Data Download Performance (kbps) - Dynamic

3G/4G/ Network:

Data Services Dynamic	3G/VoLTE			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download Throughput (Mbps)	<b>0.914</b>	<b>12.81</b>	<b>21.9</b>	<b>10.94</b>



# Summary

## City Level Summary-Voice

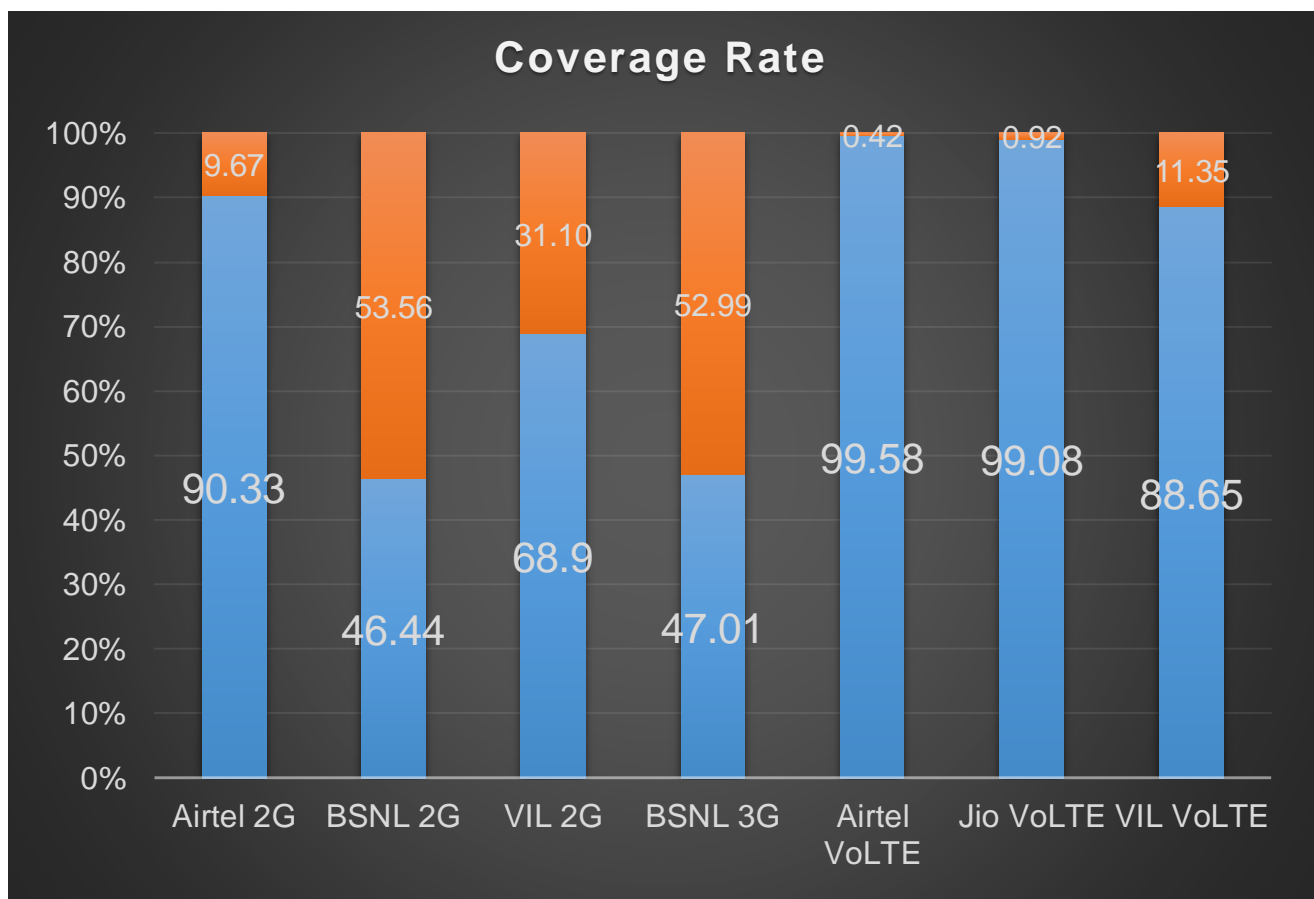
Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	137	140	134
Blocked Call Rate (%)	0	1.42%	1.49%
CSSR% (Accessibility)	100	98.58%	98.51
Drop Call Rate (%)	0	1.44%	1.52%
Mobility HOSR (%)	100%	95.61%	97.16%
Rx Quality (%)	92.79%	95.25%	93.68%
Average CST Sec	2.26	3.1	2.89

Voice Call	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	140	137	131	140
Blocked Call Rate (%)	2.14%	0%	0%	0.71%
CSSR% (Accessibility)	97.86%	100%	100%	99.29%
Drop Call Rate (%)	1.45%	0%	0%	0%
Mobility HOSR (%)	99.68%	100%	99.28%	100%
Rx Quality (%)	90.50%	80.03%	84.51%	91.78%
Average CST Sec	3.1	1.3	0.64	1.36

## 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  $\geq$  -110dBm. The details are as follows.

TSP	Coverage Rate %
Airtel 2G	90.33%
BSNL 2G	46.44%
VIL 2G	68.9%
BSNL 3G	47.01%
Airtel VoLTE	99.58%
Jio VoLTE	99.08%
VIL VoLTE	88.65%





## TSP-AIRTEL

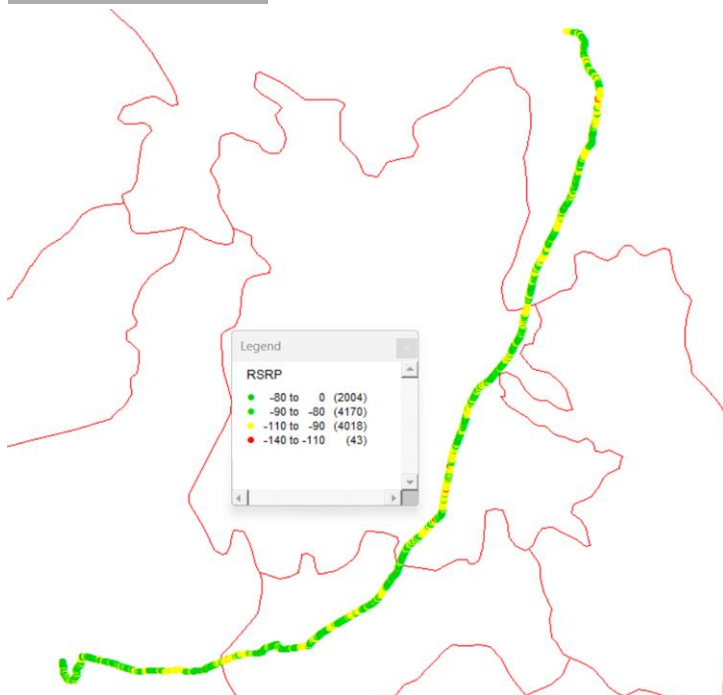
Technology	Coverage %
2G	90.33%
VoLTE	99.58%

2G



2G			
Overall RxLevel	# Samples	% PDF	Legend s
[Max, >=-75]	832034	63.11%	Green
[-75, >=-85)	358931	27.22%	Yellow
[-85, >=-95)	114146	8.66%	Orange
[-95, >=Min)	13316	1.01%	Red
<b>Total</b>	<b>1318427</b>	<b>100%</b>	

VoLTE



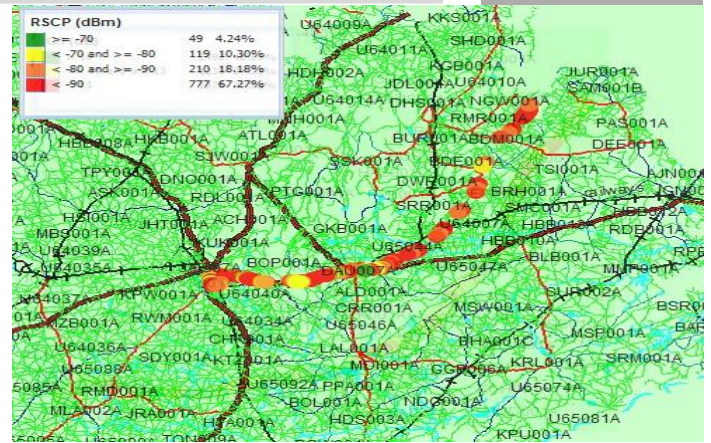
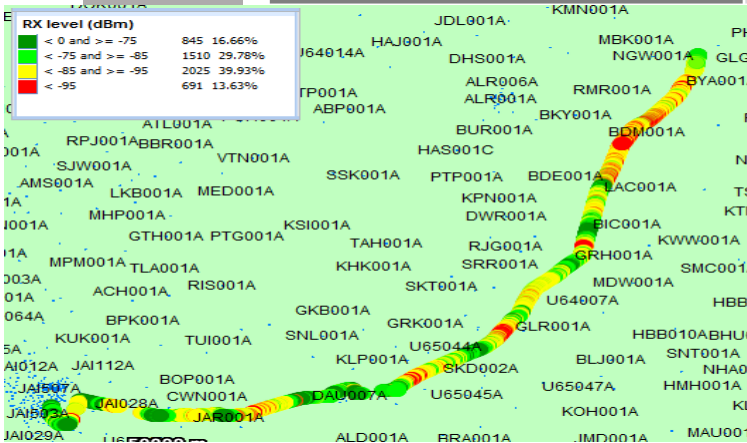
VoLTE			
Overall RSRP	# Samples	% PDF	Legend s
[Max, >=-80]	2004	19.58%	Green
[-80, >=-90)	4170	40.74%	Yellow
[-90, >=-110)	4018	39.26%	Orange
[-110, >=Min)	43	0.42%	Red
<b>Total</b>	<b>10235</b>	<b>100%</b>	

## TSP- BSNL

Technology	Coverage %
2G	46.44%
3G	47.01%

2G

3G



### 2G

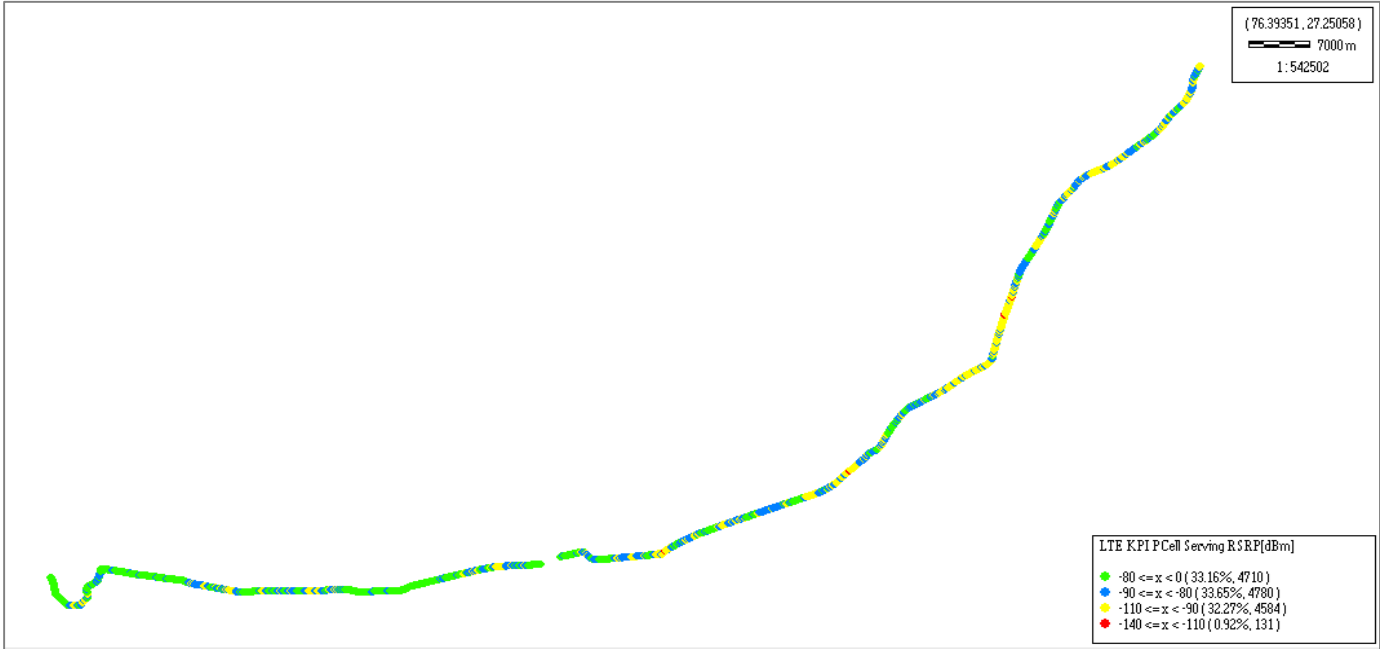
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	845	16.66%	
[-75, >=-85)	1510	29.78%	
[-85, >=-95)	2025	39.93%	
[-95, >=Min)	691	13.63%	
<b>Total</b>	<b>5071</b>	<b>100%</b>	

### 3G

Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	49	4.24%	
[-70, >=-80)	119	10.31%	
[-80, >=-90)	210	18.18%	
[-90, >=Min)	777	67.27%	
<b>Total</b>	<b>1155</b>	<b>100%</b>	

JIO

Technology	Coverage %
VoLTE	99.08%

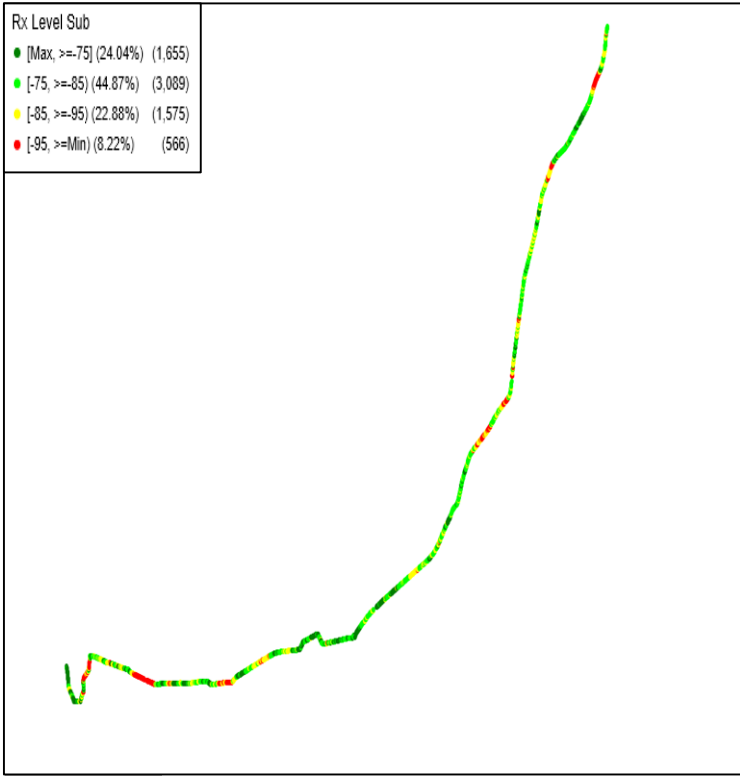


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	4710	33.16%	Green
[-80, >=-90)	4780	33.65%	Yellow
[-90, >=-110)	4584	32.27%	Orange
[-110, >=Min)	131	0.92%	Red
<b>Total</b>	<b>14205</b>	<b>100%</b>	

## VIL

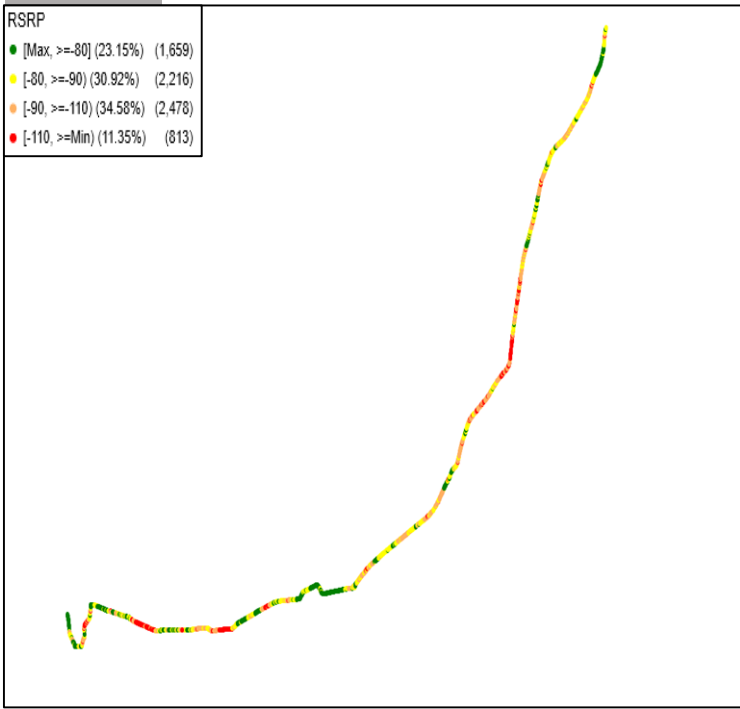
Technology	Coverage Rate %
2G	68.90%
VoLTE	88.65%

### 2G



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	1655	24.04%	
[-75, >=-85]	3089	44.87%	
[-85, >=-95]	1575	22.88%	
[-95, >=Min]	566	8.22%	
<b>Total</b>	<b>6885</b>	<b>100%</b>	

### VoLTE

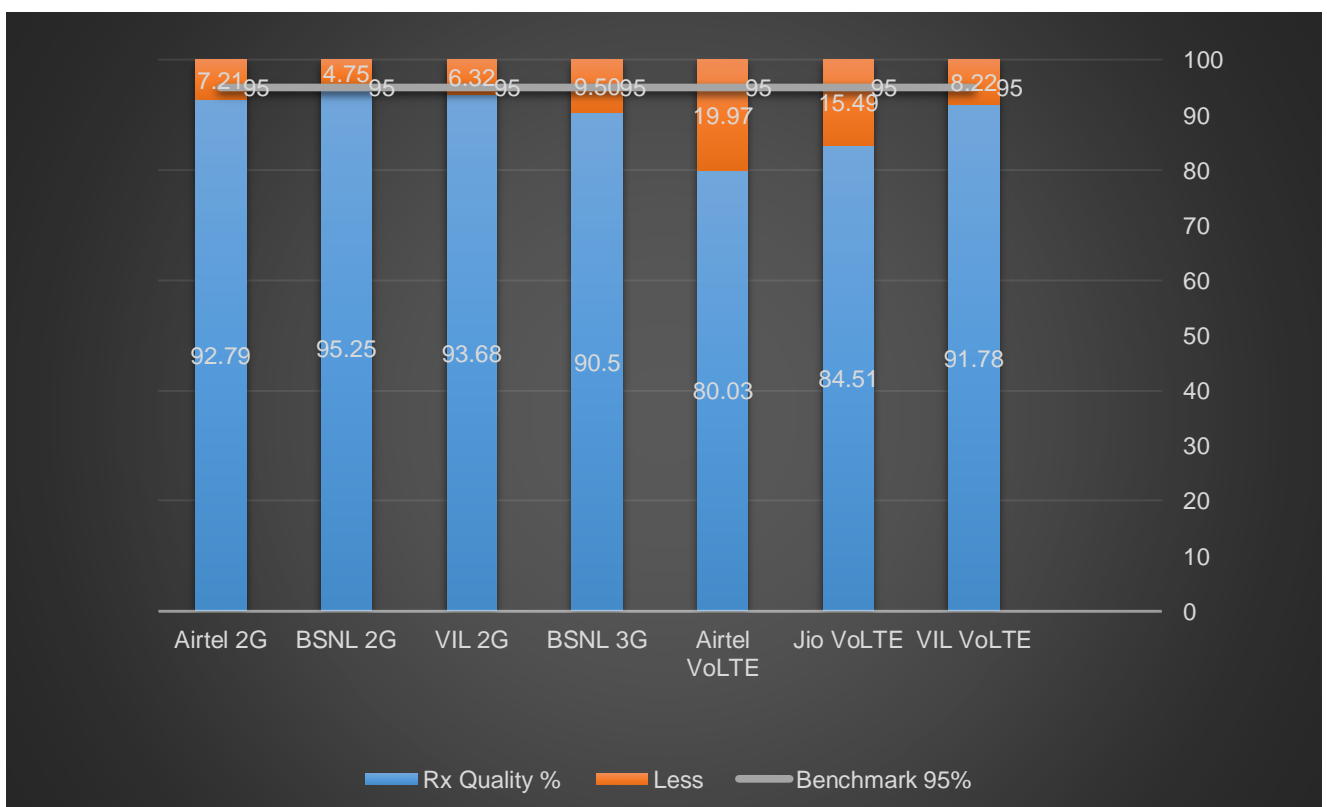


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	1659	23.15%	
[-80, >=-90]	2216	30.92%	
[-90, >=-110]	2478	34.58%	
[-110, >=Min]	813	11.35%	
<b>Total</b>	<b>7166</b>	<b>100%</b>	

## II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual  $\leq 5$  for GSM TSPs, EcNo  $\geq -14$  dBm for 3G TSP sand 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  $\geq 95\%$ .

<u>TSP</u>	Rx Quality %
Airtel 2G	<b>92.79%</b>
BSNL 2G	<b>95.25%</b>
VIL 2G	<b>93.68%</b>
BSNL 3G	<b>90.5%</b>
Airtel VoLTE	<b>80.03%</b>
Jio VoLTE	<b>84.51%</b>
VIL VoLTE	<b>91.78%</b>



## II. Quality Details

### Airtel

2G

Technology	Rx Quality %
2G	<b>92.79%</b>
VoLTE	<b>80.03%</b>



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1078742	81.82%	
(2, <=3)	46826	3.55%	
(3, <=4)	50614	3.84%	
(4, <=5)	47148	3.58%	
(5, <=Max)	95097	7.21%	
<b>Total</b>	<b>1318427</b>	<b>100%</b>	

VoLTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=-6)	144	1%	
(0, <-6)	1897	19%	
(0, <=5)	3237	32%	
(5, <=10)	2562	25%	
(10, <=15)	1367	13%	
(15, <=Max)	1013	10%	
<b>Total</b>	<b>10220</b>	<b>100%</b>	

## II. Quality Details

### BSNL

2G

Technology

Rx Quality %

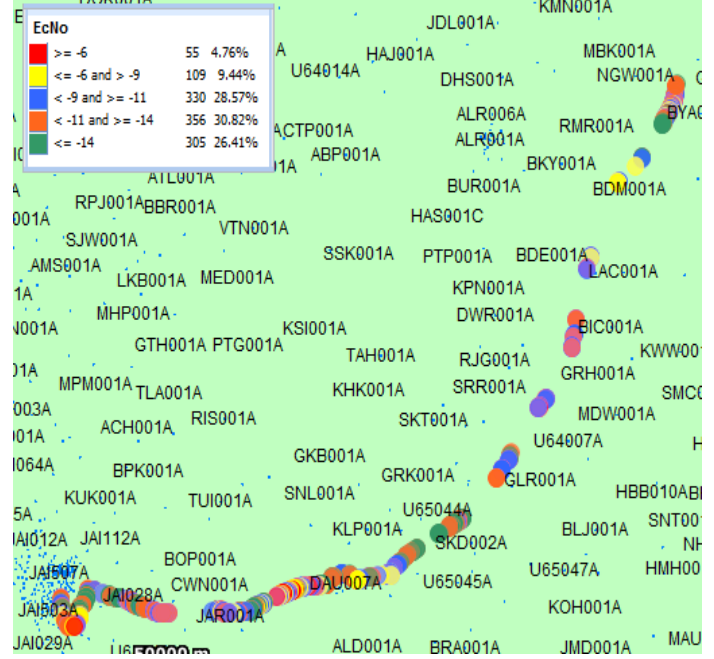
2G

95.25%

3G

90.5%

3G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	3568	82.65%	
(2, <=3)	263	6.09%	
(3, <=4)	164	3.80%	
(4, <=5)	117	2.71%	
(5, <=Max)	205	4.75%	
<b>Total</b>	<b>20061</b>	<b>100%</b>	

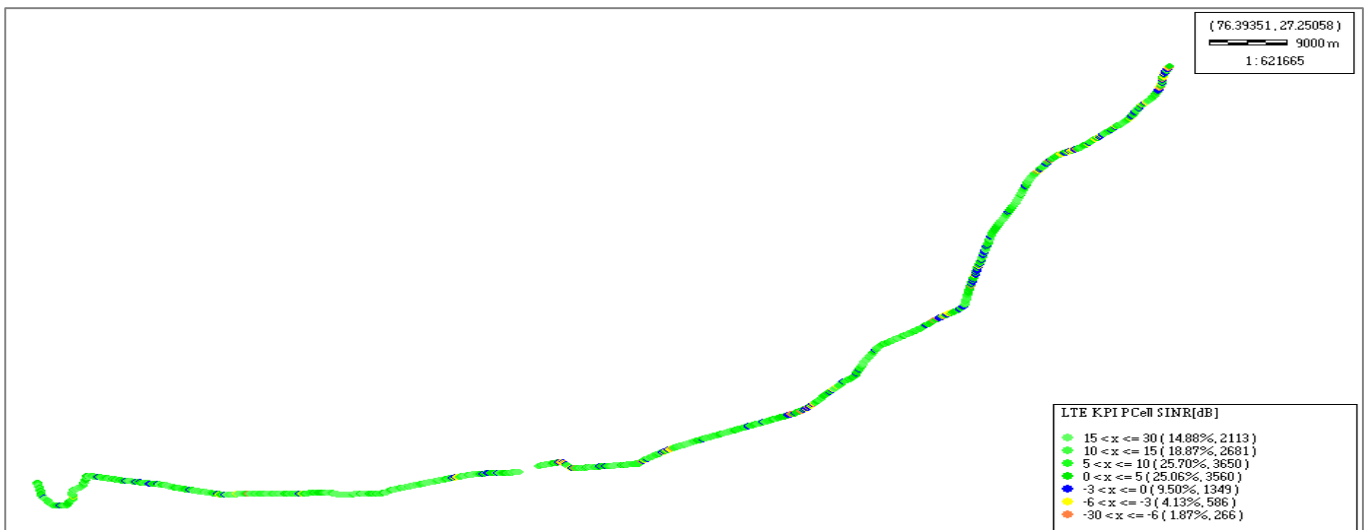
Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	55	4.76%	
(-6, <=-9)	109	9.44%	
(-9, <=-11)	330	28.57%	
(-11, <=-14)	356	30.82%	
(-14, <= Min)	305	26.41%	
<b>Total</b>	<b>1155</b>	<b>100%</b>	

## II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual  $\leq 5$  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  $\geq 95\%$ .

### JIO

Technology	Rx Quality %
VoLTE	<b>84.51%</b>



Overall SINR	# Samples	% PDF	Legends
(Min, $\leq -6$ )	266	1.87%	
(-6, $\leq -3$ )	586	4.12%	
(-3, $\leq 0$ )	1349	9.50%	
(0, $\leq 5$ )	3560	25.06%	
(5, $\leq 10$ )	3650	25.70%	
(10, $\leq 15$ )	2681	18.87%	
(15, $\leq \text{Max}$ )	2113	14.88%	
<b>Total</b>	<b>14205</b>	<b>100%</b>	

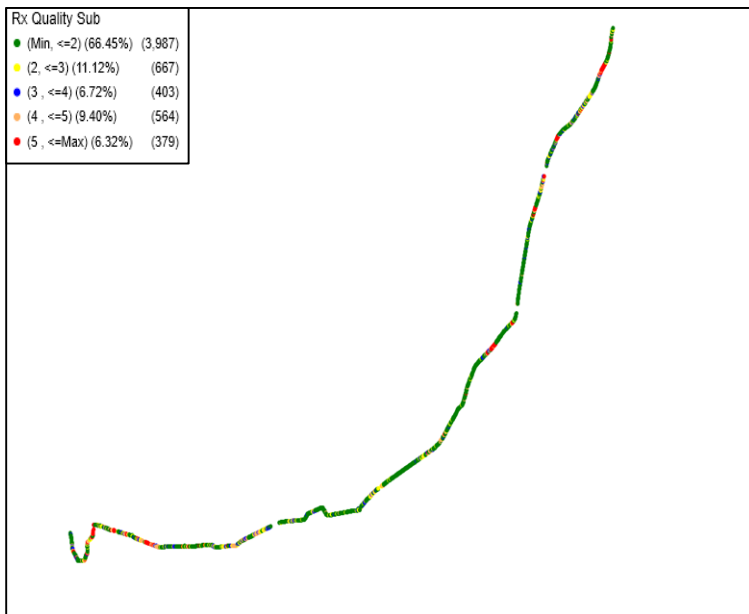


## II. Quality Details

### VIL

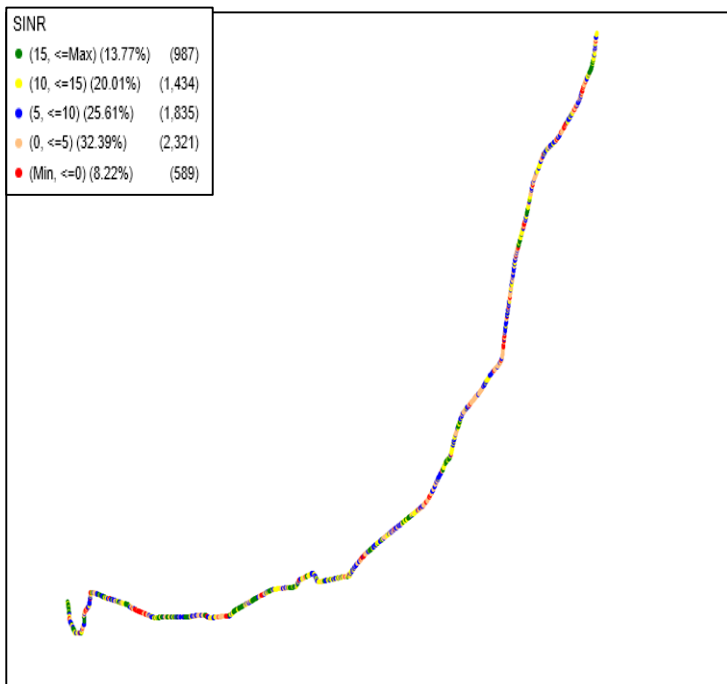
Technology	Rx Quality %
2G	93.68%
4G	91.78%

2G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	3987	66.44%	Green
(2, <=3)	667	11.12%	Yellow
(3, <=4)	403	6.72%	Blue
(4, <=5)	564	9.40%	Orange
(5, <=Max)	379	6.32%	Red
<b>Total</b>	<b>6000</b>	<b>100%</b>	

### VoLTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	589	8.22%	Red
(0, <=5)	2321	32.39%	Orange
(5, <=10)	1835	25.61%	Blue
(10, <=15)	1434	20.01%	Yellow
(15, <=Max)	987	13.77%	Green
<b>Total</b>	<b>7166</b>	<b>100%</b>	

### III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	18.24%
Airtel VoLTE	100.00%
Jio VoLTE	100.00%
VIL VoLTE	99.99%

