



## Operator Assisted Drive Test Report

### Bhiwani-Kalanaur-Rohtak Bypass-Jhajjar Bypass- Charkhi Dadri highway

21<sup>st</sup> December 2023 by  
TRAI Regional office Jaipur

**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%.

The Operator Assisted Drive Test has been carried out by Regional Office, Jaipur with the help of Service Providers in Bhiwani-Kalanaur-Rohtak Bypass-Jhajjar Bypass-Charkhi Dadri from 9:00 AM to 8:00 PM on 21 December 2023. The drive test covered drive route of 153 KMs over a period of 1 day. Approximately 170 calls were made in TSPs network

Overview

Voice  
Summary

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Summary

# Overview

Regional Office, TRAI Jaipur conducted Operator Assisted Drive Test on 21<sup>st</sup> Dec. 2023 covering Highways of **Bhiwani-Kalanaur-Rohtak Bypass-Jhajjar Bypass-Charkhi Dadri** . The performance of Vodafone Idea 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 approximately 153 KMs. Approximately 190 calls were made for each of the TSPs networks: three 2G (Lock Mode) networks, two 3G (Dual mode) networks and three VoLTE /5G networks covering 4 unique TSPs.

## **Data Tests:**

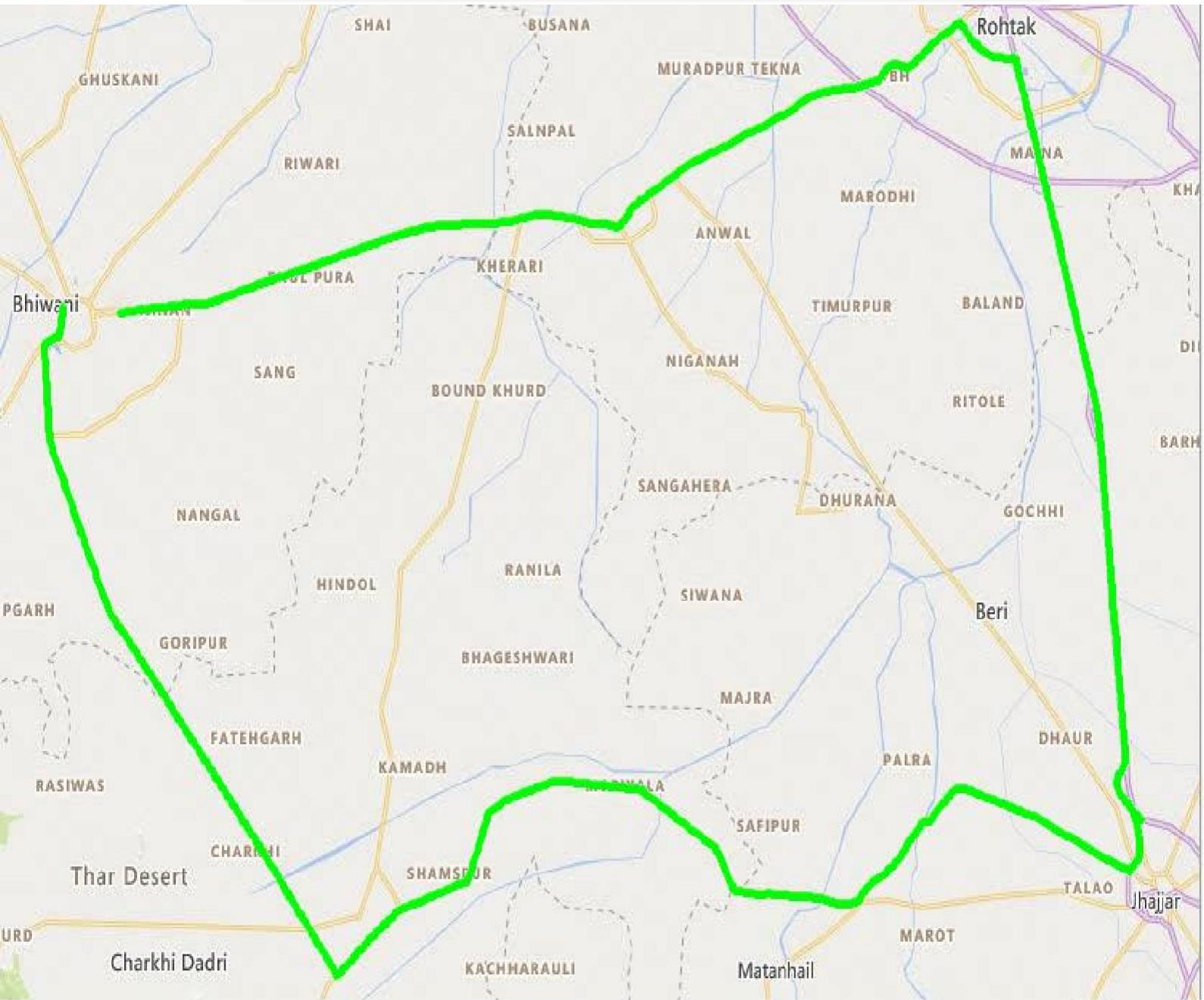
**Dynamic data test** was conducted for ..... kms for download throughput in all technologies. 2G – measurement – UE Locked in 2G file size- 500KB

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

4G – measurement – UE in LTE /5G File Size- 40MB

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>

## Voice & Dynamic Data Test Drive Route TSP-VIL

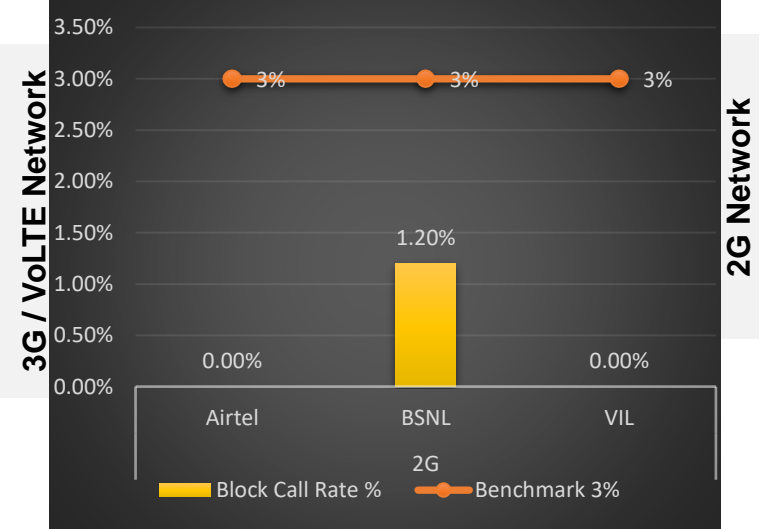
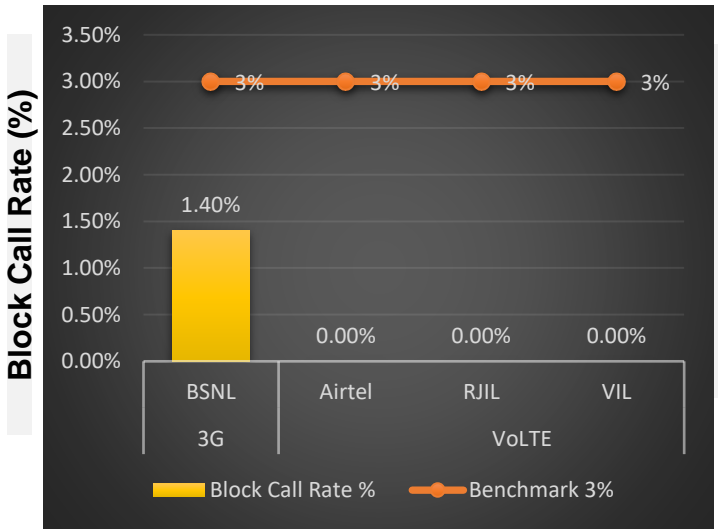
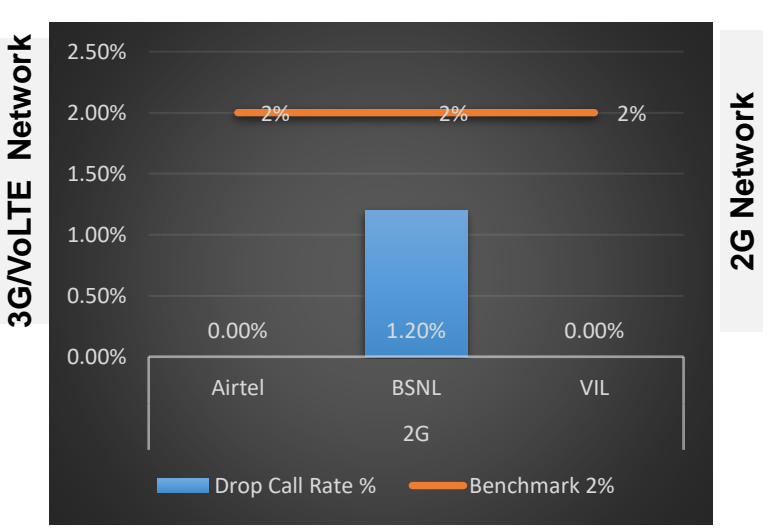
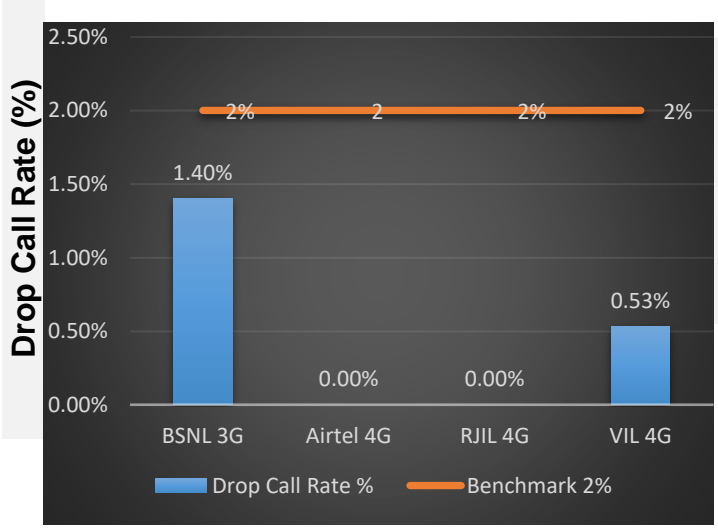


Date	Test Scenario	Area to be Covered
21-Dec-23	2G/3G/4G Voice and 3G/4G/5G Dynamic Data	<p><b>Starting Point BSNL EXCHANGE at 9:30 AM</b>  <b>Highway Drive from Bhiwani-Bamla-Kalanaur-Rohtak Bypass-Dighal-Jhajjar Bypass-Chhuchhakwas-Charkhi Dadri-Bhiwani</b></p>

# Voice Calls

## Key Observations

**QoS compliance** of the TSPs on Bhiwani To Rohtak, Jhajjar, Dadri 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%	1.20%	0.00%	1.40%	0.00%	0.00%	0.53%
Block Call Rate %	0.00%	1.20%	0.00%	1.40%	0.00%	0.00%	0.00%

- 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 %	97.40%	74.17%	80.21%

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

TSPs	3G
	BSNL
Coverage %	58.64%

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	98.30%	99.64%	98.47%

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

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	65.50%	100.00%	100.00%	100.00%

# Data Services Dynamic

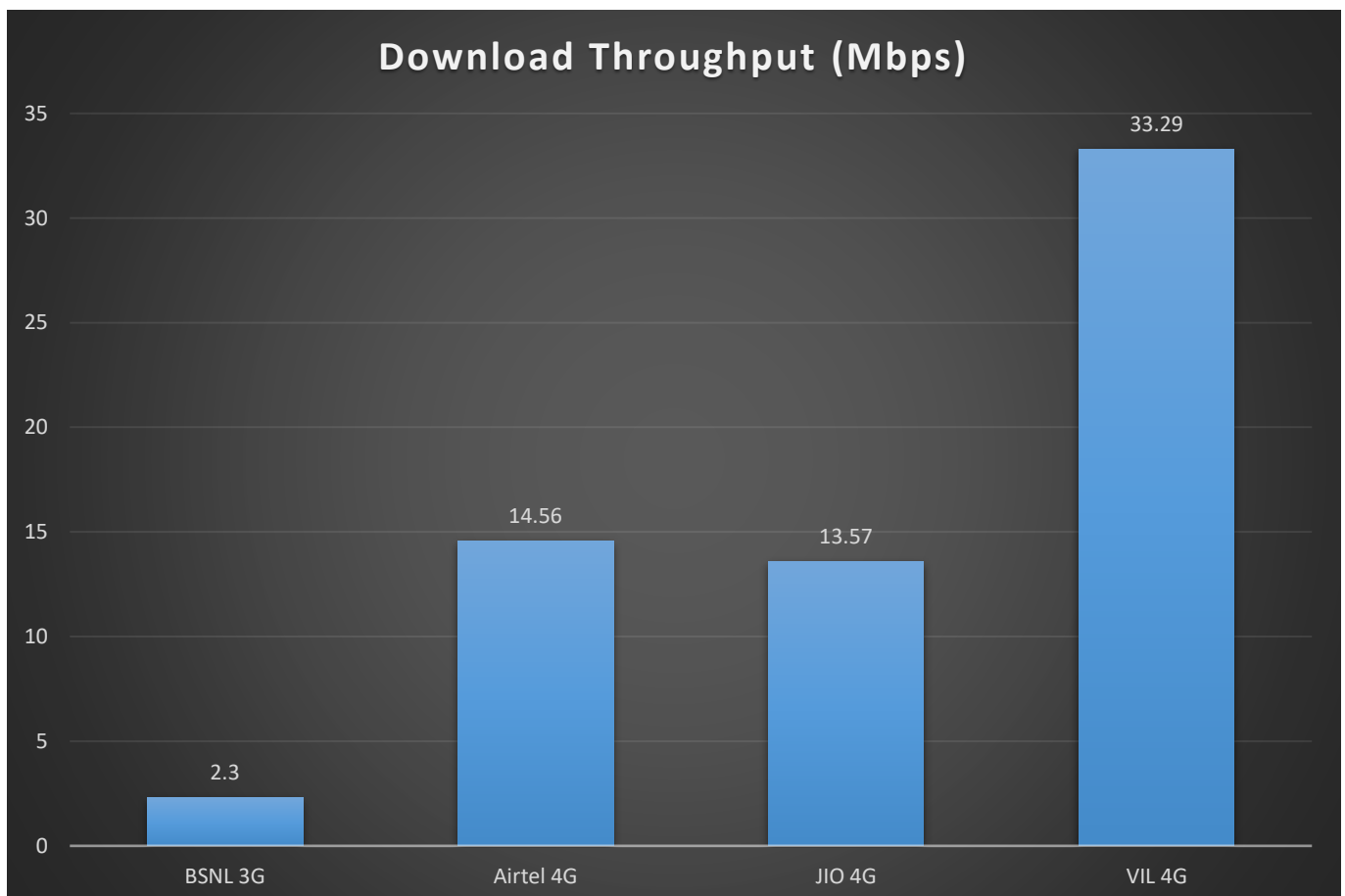
**Key Observations**

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>2.3</b>	<b>14.56</b>	<b>13.57</b>	<b>33.29</b>



# Summary

## City Level Summary-Voice

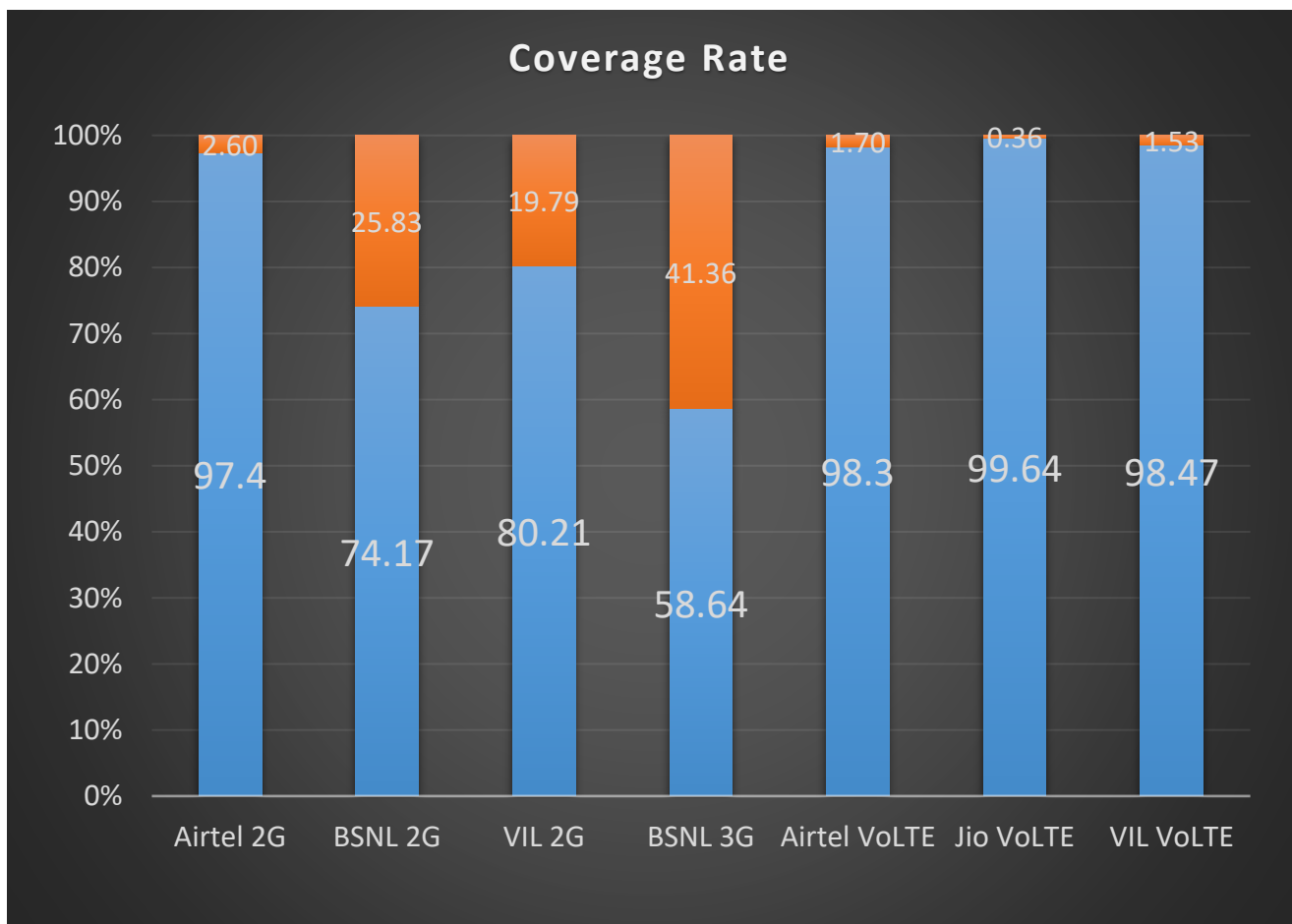
Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	153	153	183
Blocked Call Rate (%)	0%	1.2%	0
CSSR% (Accessibility)	100%	98.69%	100%
Drop Call Rate (%)	0%	1.2%	0
Mobility HOSR (%)	97.40%	98.45%	99.95%
Rx Quality (%)	95.30%	94.66%	93.4%
Average CST Sec	3.86	5.6	5.51

Voice Call	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	157	158	200	190
Blocked Call Rate (%)	1.4	0%	0	0
CSSR% (Accessibility)	98.36	100%	100%	100%
Drop Call Rate (%)	1.4%	0%	0%	0.53%
Mobility HOSR (%)	99.99%	98.30%	99.89%	99.99%
Rx Quality (%)	96.73%	95.10%	97%	90.24%
Average CST Sec	3.8	1.5	0.46	2.61

## 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	97.4%
BSNL 2G	74.17%
VIL 2G	80.21%
BSNL 3G	58.64%
Airtel VoLTE	98.3%
Jio VoLTE	99.64%
VIL VoLTE	98.47%

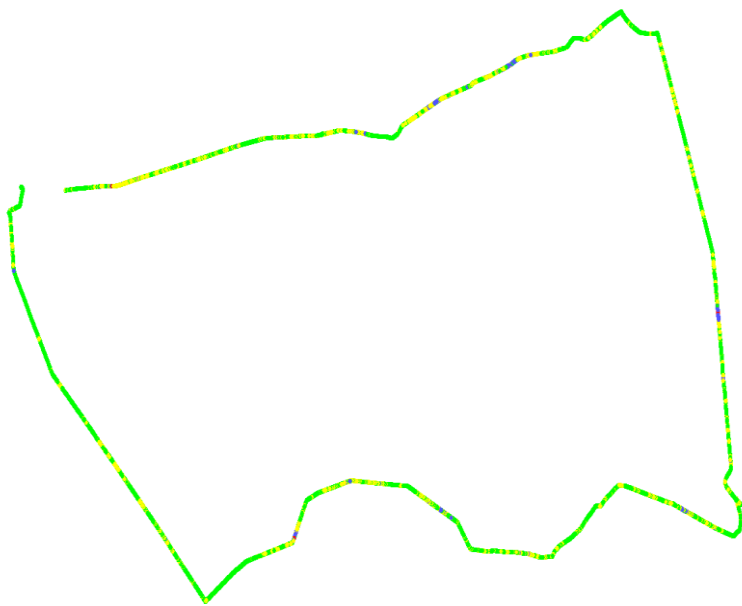




## TSP-AIRTEL

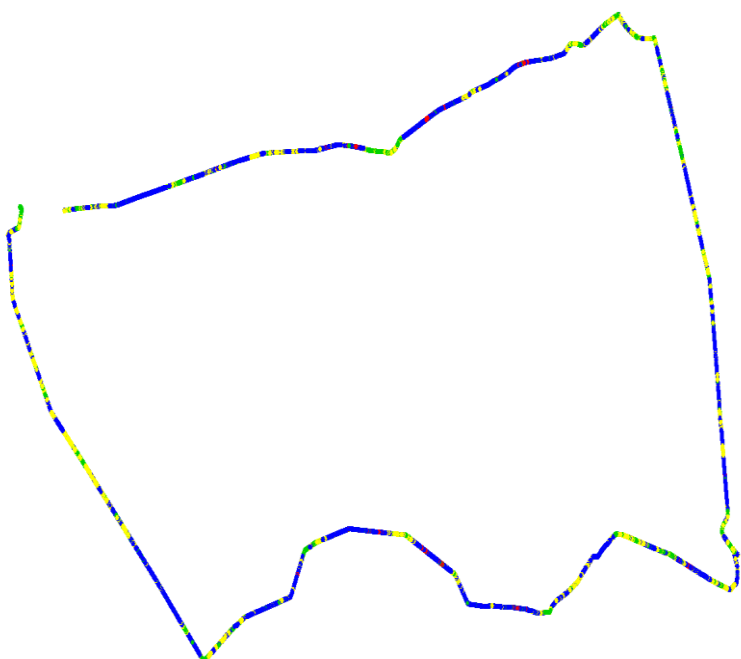
Technology	Coverage %
2G	97.4%
VoLTE	98.3%

2G



2G			
Overall RxLevel	# Samples	% PDF	Legend s
[Max, >=-75]	765540	69.6%	Green
[-75, >=-85)	305663	27.8%	Yellow
[-85, >=-95)	27495	2.5%	Orange
[-95, >=Min)	965	0.1%	Red
<b>Total</b>	<b>1099663</b>	<b>100%</b>	

VoLTE



VoLTE			
Overall RSRP	# Samples	% PDF	Legend s
[Max, >=-80]	450728	21.5%	Green
[-80, >=-90)	641230	30.6%	Yellow
[-90, >=-110)	969616	46.3%	Orange
[-110, >=Min)	34607	1.7%	Red
<b>Total</b>	<b>2096181</b>	<b>100%</b>	

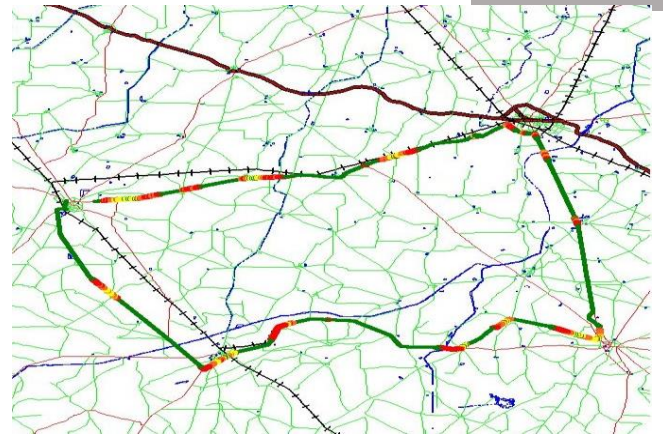
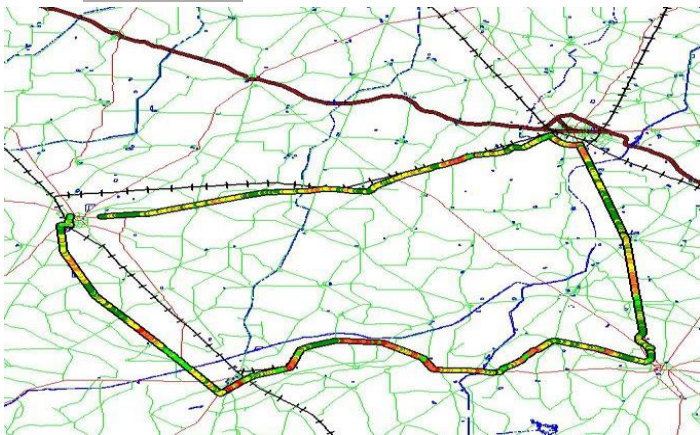
## TSP- BSNL

Technology	Coverage %
2G	74.17%
3G	58.64%

2G

3G

3G



### 2G

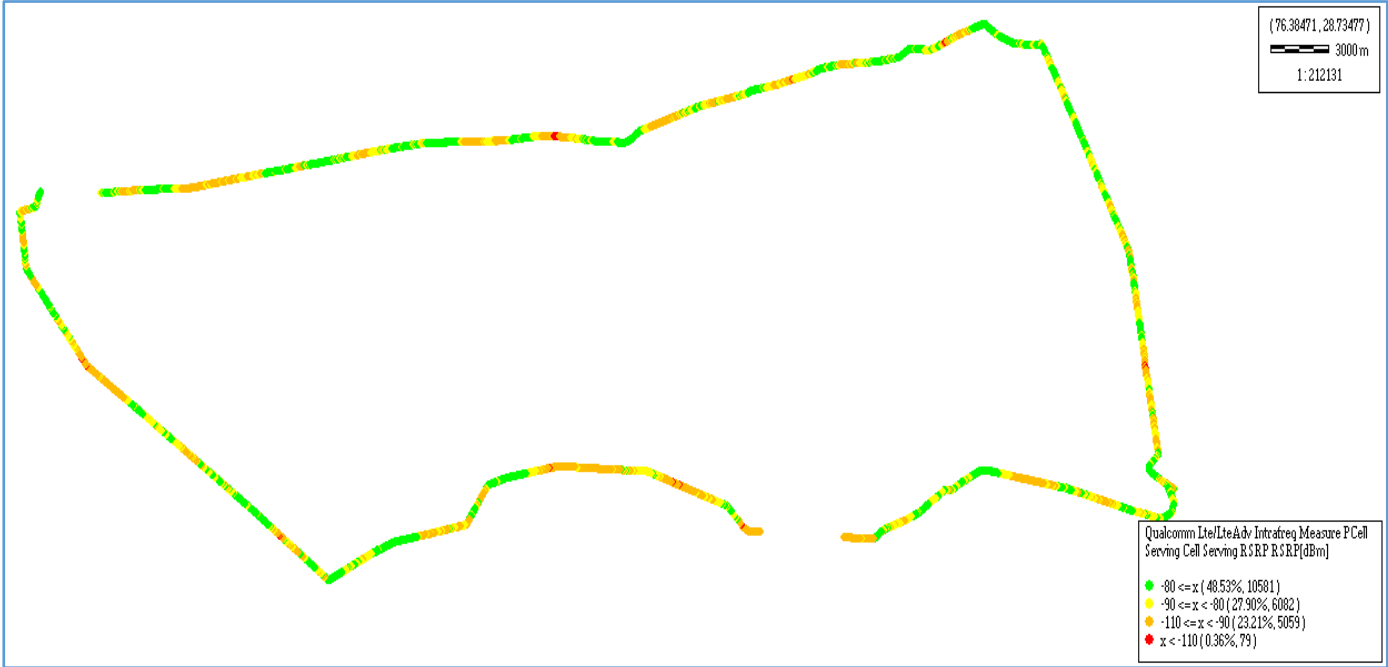
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	5154	35.15%	
[-75, >=-85)	5597	38.61%	
[-85, >=-95)	2970	20.49%	
[-95, >=Min)	774	5.75%	
<b>Total</b>	<b>14495</b>	<b>100%</b>	

### 3G

Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	341	5.21%	
[-70, >=-80)	1234	18.87%	
[-80, >=-90)	2261	34.56%	
[-90, >=Min)	2706	41.36%	
<b>Total</b>	<b>6542</b>	<b>100%</b>	

JIO

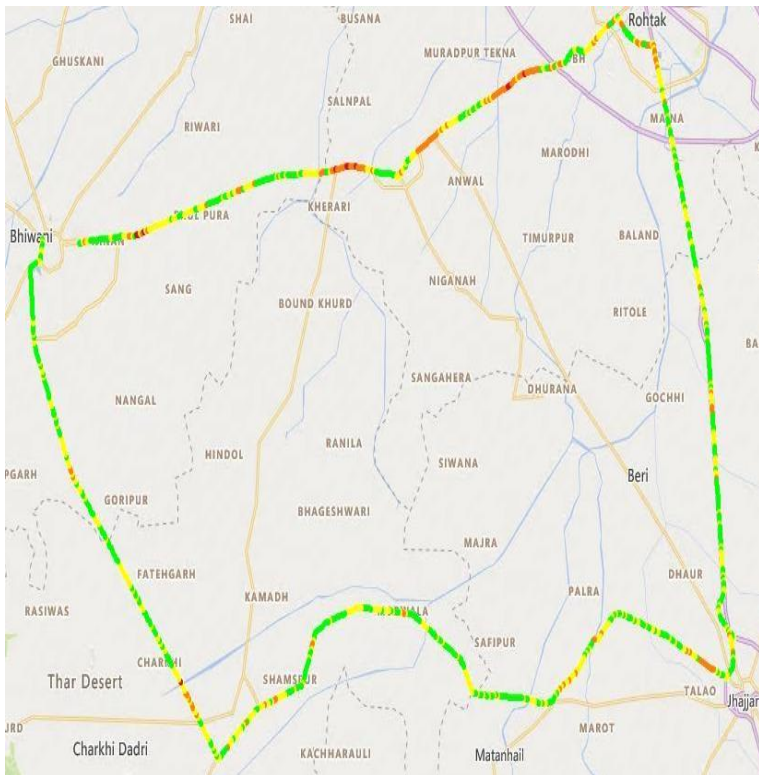
Technology	Coverage %
VoLTE	99.64%



VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	10581	48.53%	
[-80, >=-90)	6082	27.90%	
[-90, >=-110)	5059	23.21%	
[-110, >=Min)	79	.36%	
<b>Total</b>	<b>21801</b>	<b>100%</b>	

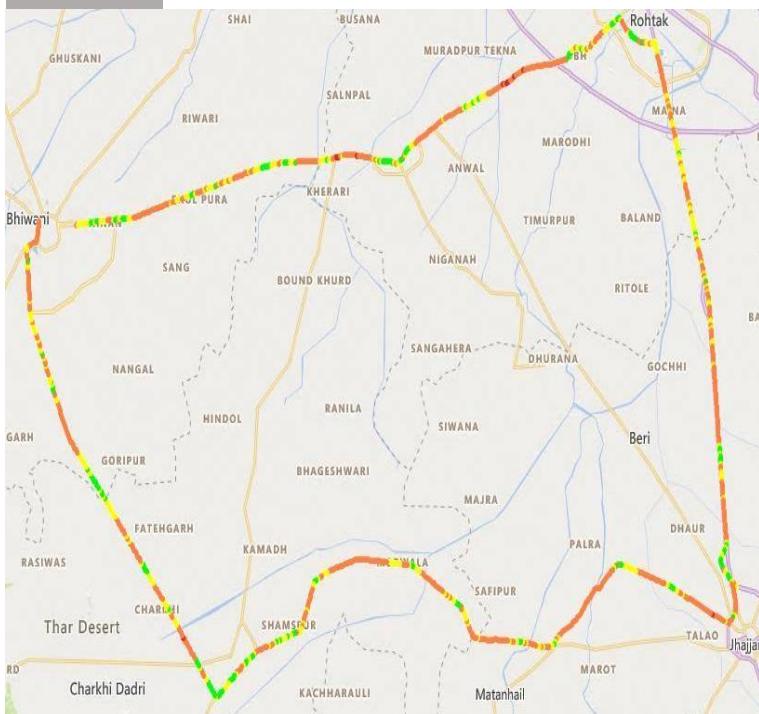
## VIL

	Technology	Coverage Rate %
2G	2G	80.21%
	VoLTE	98.47%



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	756053	74.35%	Green
[-75, >=-85)	59637	5.86%	Yellow
[-85, >=-95)	180320	17.73%	Orange
[-95, >=Min)	20871	2.06%	Red
<b>Total</b>	<b>1016881</b>	<b>100%</b>	

## VoLTE

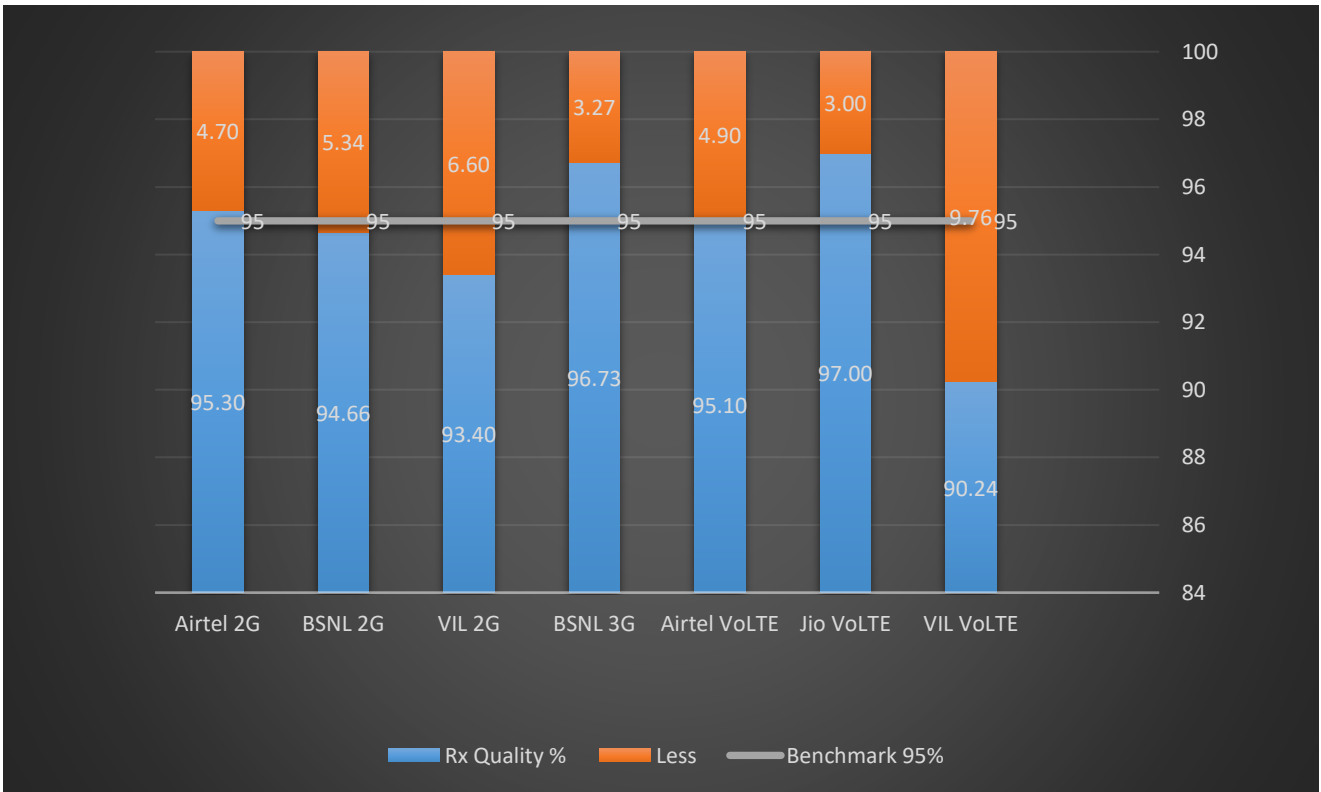


VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	911153	19.03%	Green
[-80, >=-90)	1545660	32.27%	Yellow
[-90, >=-110)	2259053	47.17%	Orange
[-110, >=Min)	73031	1.53%	Red
<b>Total</b>	<b>4788897</b>	<b>100%</b>	

## 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>95.30%</b>
BSNL 2G	<b>94.66%</b>
VIL 2G	<b>93.40%</b>
BSNL 3G	<b>96.73%</b>
Airtel VoLTE	<b>95.10%</b>
Jio VoLTE	<b>97.00%</b>
VIL VoLTE	<b>90.24%</b>



## II. Quality Details

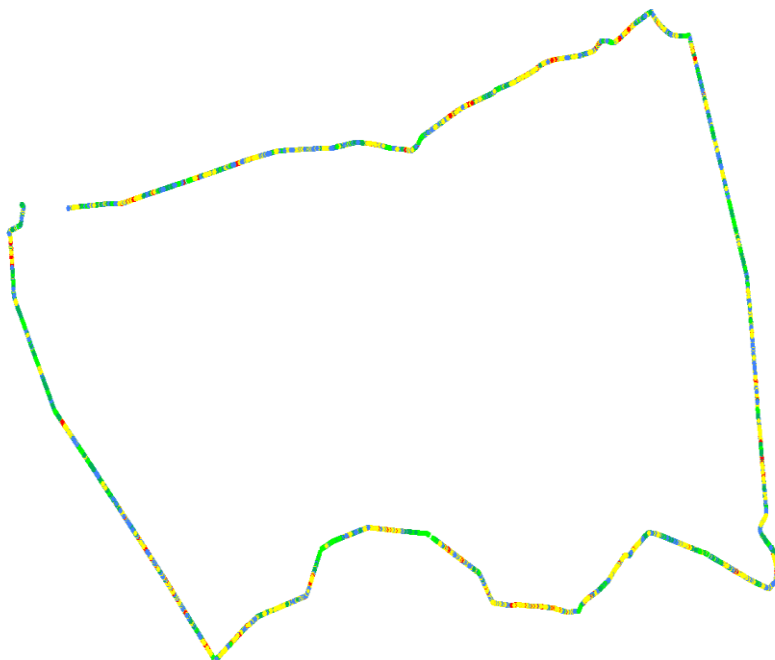
### Airtel

	Technology	Rx Quality %
2G	2G	95.3%
	VoLTE	95.1%



Overall Rx Quality	# Samples	% PDF	Legend s
(Min, <=2)	929259	84.5%	<span style="color: green;">■</span>
(2, <=3)	40572	3.7%	<span style="color: yellow;">■</span>
(3, <=4)	31618	2.9%	<span style="color: blue;">■</span>
(4, <=5)	46495	4.2%	<span style="color: orange;">■</span>
(5, <=Max)	51719	4.7%	<span style="color: red;">■</span>
<b>Total</b>	<b>1099663</b>	<b>100%</b>	

### VoLTE



Overall SINR	# Samples	% PDF	Legend s
(Min, <=0)	99359	4.9%	<span style="color: red;">■</span>
(0, <=5)	650827	32.1%	<span style="color: orange;">■</span>
(5, <=10)	543699	26.8%	<span style="color: blue;">■</span>
(10, <=15)	424375	20.9%	<span style="color: yellow;">■</span>
(15, <=Max)	310928	15.4%	<span style="color: green;">■</span>
<b>Total</b>	<b>2029188</b>	<b>100%</b>	

## II. Quality Details

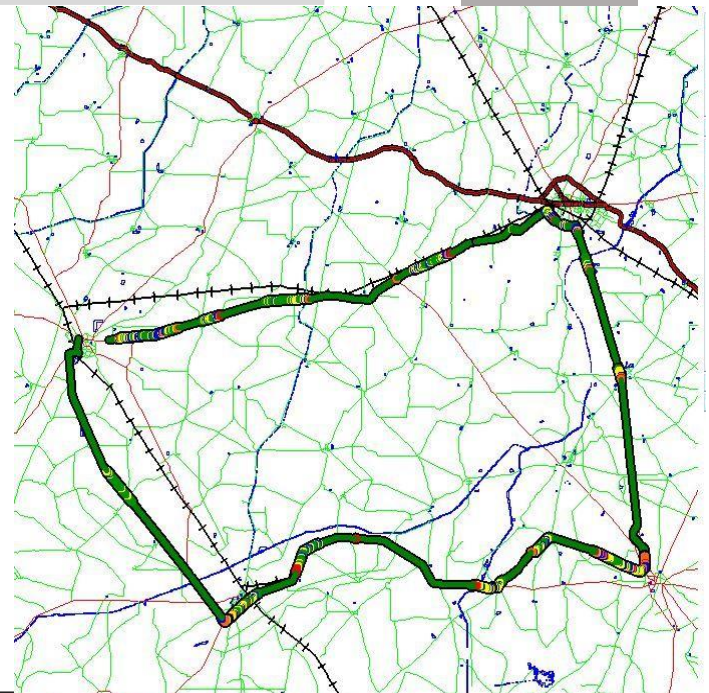
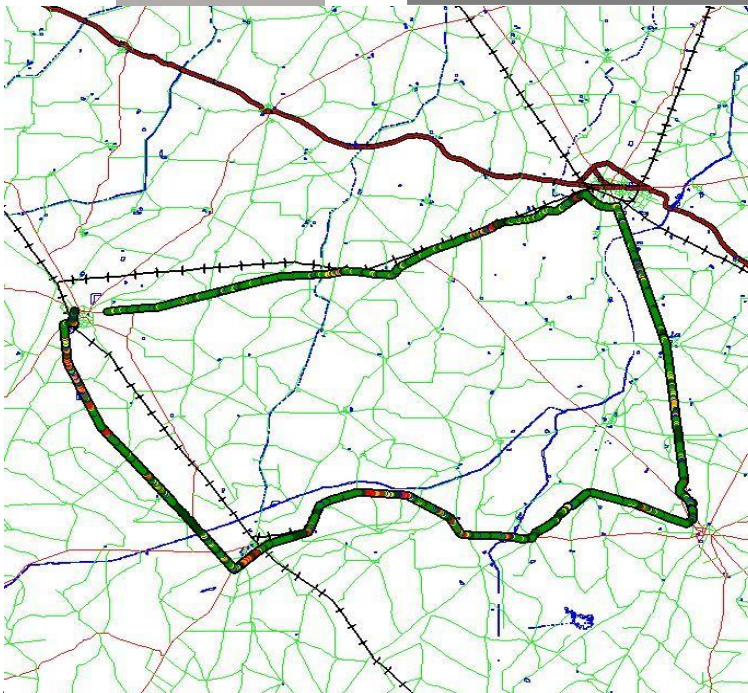
### BSNL

Technology	Rx Quality %
2G	94.66%
3G	96.73%

2G

3G

3G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	9859	78.27%	Green
(2, <=3)	832	6.61%	Yellow
(3, <=4)	676	5.36%	Blue
(4, <=5)	557	4.42%	Orange
(5, <=Max)	672	5.34%	Red
<b>Total</b>	<b>12596</b>	<b>100%</b>	

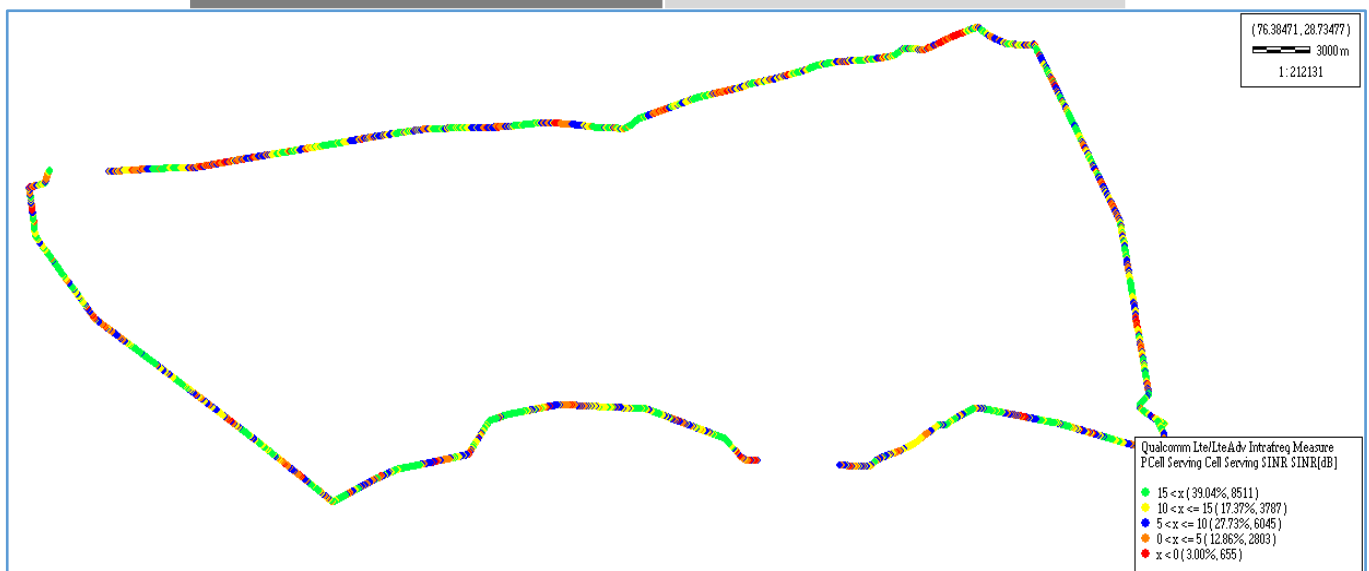
Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	2684	41.02%	Green
(-6, <=-9)	2009	30.71%	Yellow
(-9, <=-11)	1094	16.73%	Blue
(-11, <=-14)	542	8.28%	Orange
(-14, <= Min)	214	3.27%	Red
<b>Total</b>	<b>6543</b>	<b>100%</b>	

## 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	97%



Overall SINR	# Samples	% PDF	Legends
(Min, $\leq 0$ )	655	3.00%	
(0, $\leq 5$ )	2803	12.86%	
(5, $\leq 10$ )	6045	27.73%	
(10, $\leq 15$ )	3787	17.37%	
(15, $\leq$ Max)	8511	39.04%	
<b>Total</b>	<b>21801</b>	<b>100%</b>	

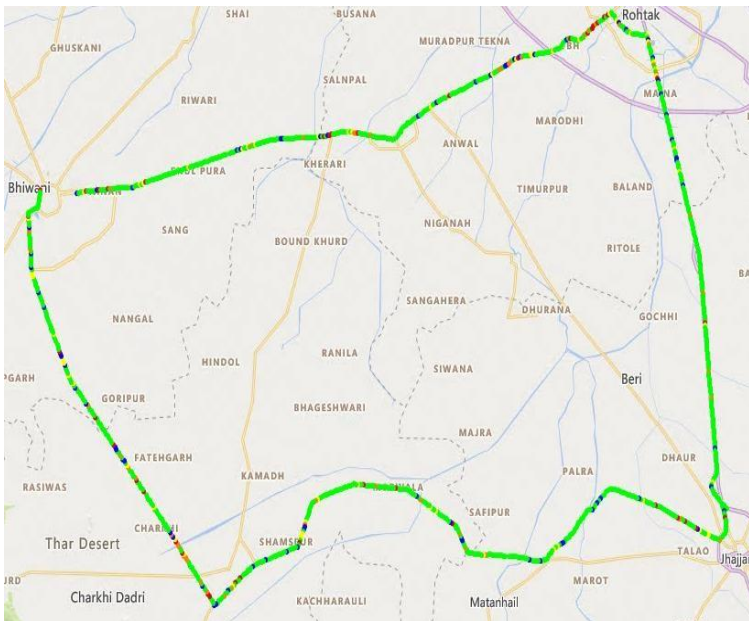


## II. Quality Details

### VIL

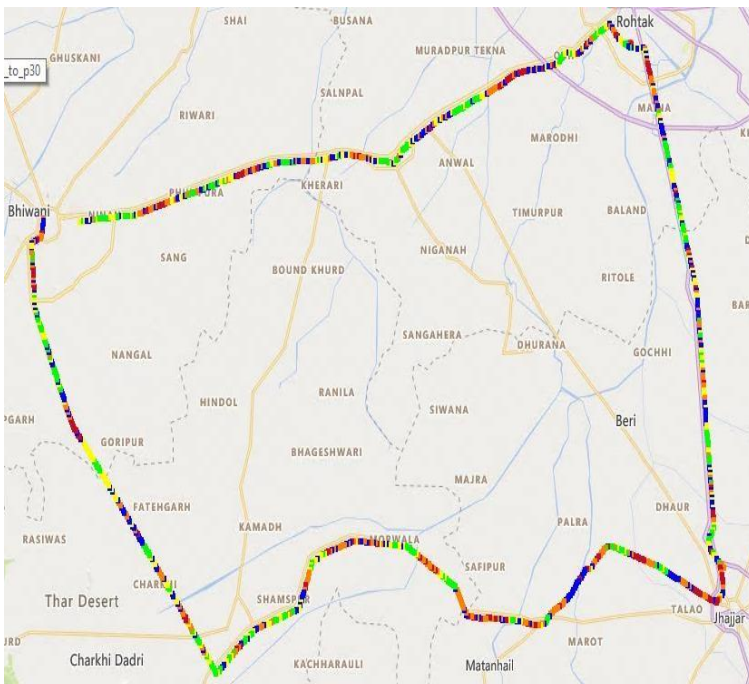
Technology	Rx Quality %
2G	93.40%
4G	90.24%

2G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1200777	82.28%	Green
(2, <=3)	42664	2.92%	Yellow
(3, <=4)	59853	4.10%	Blue
(4, <=5)	59760	4.10%	Orange
(5, <=Max)	96291	6.60%	Red
<b>Total</b>	<b>1459345</b>	<b>100%</b>	

VoLTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	467162	9.76%	Red
(0, <=5)	941420	19.67%	Orange
(5, <=10)	1098814	22.97%	Blue
(10, <=15)	993194	20.76%	Yellow
(15, <=Max)	1283954	26.84%	Green
<b>Total</b>	<b>4784544</b>	<b>100%</b>	

### III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	65.50%
Airtel VoLTE	100.00%
Jio VoLTE	100.00%
VIL VoLTE	100.00%

