Operator Assisted Drive Test Report

Rohtak-Rewari Highway

23rd November 2022
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 on Rohtak Rewari Highway and Nearby area, from 9:00 AM to 5:00 PM on 23rd November 2022. The drive test covered drive route of 80 KMs over a period of 1 day. Approximately 105 calls were made for each of the networks: three 2G networks, One 3G networks and three LTE networks covering four TSPs.The Drive test reports were generated through TSPs tools and was compiled by TRAI RO Jaipur

Overview   Voice Summary   Data Summary

Overview

Regional Office, TRAI Jaipur conducted Operator Assisted Drive Test on 23rd November 2022 covering Rohtak to Rewari Highway and Nearby area. The performance of Airtel, BSNL, Vodafone Idea and Jio was monitored across various technologies (2G, 3G and 4G) by TSPs themselves through their own test kits. The TSPs reports obtained from these drive tests were compiled to assess the network quality for Voice and Data services in terms of following.

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 80 KMs. Approximately 100 calls were made for each of the 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 145 Kms for download throughput in all technologies.
3G – measurement – UE in 3G   File Size- 20MB

4G – measurement – UE in LTE 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 www.amazon.in, www.flipkart.com and PayTm
Latency	32 Bytes on www.google.com

Overview
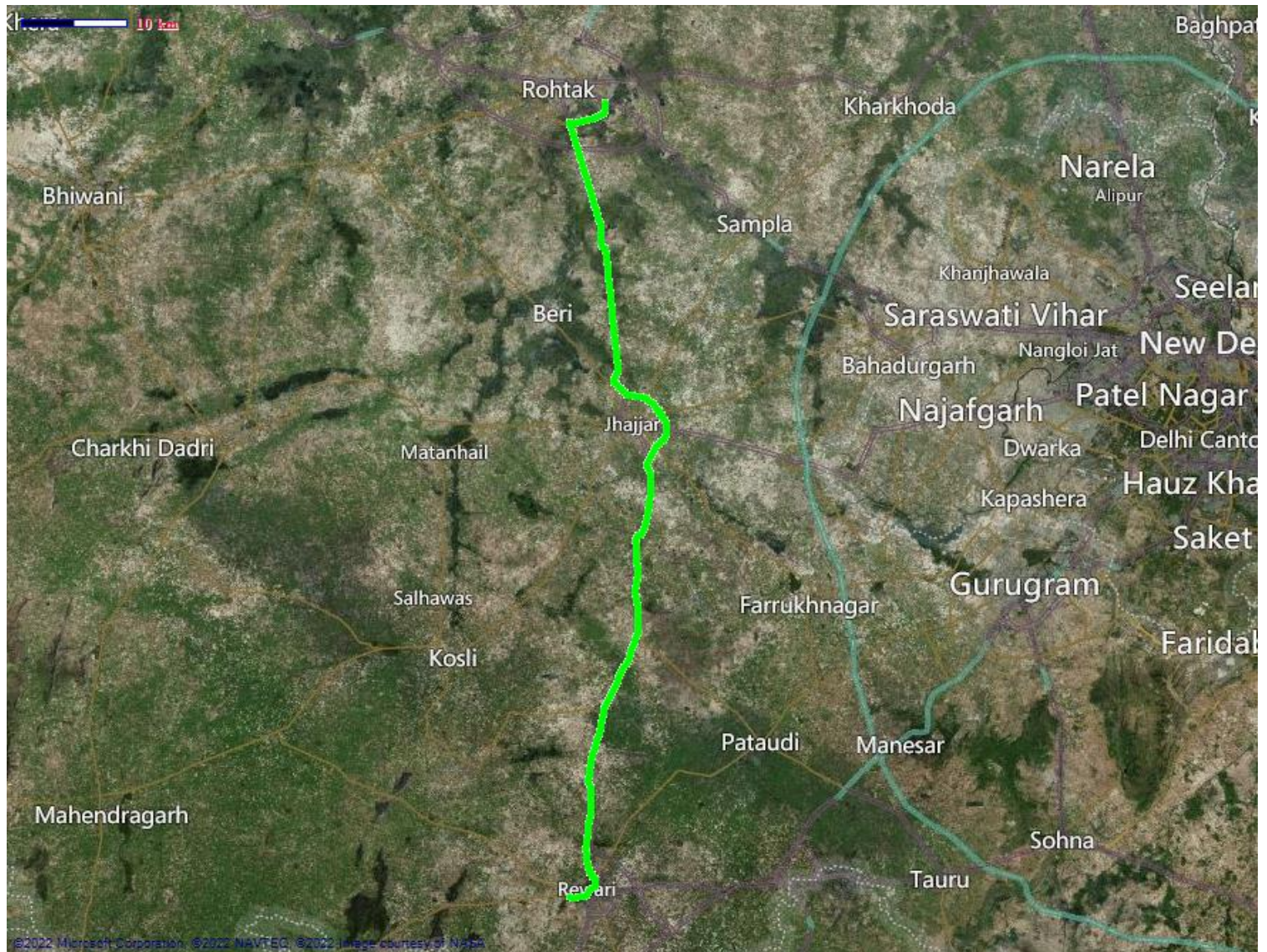
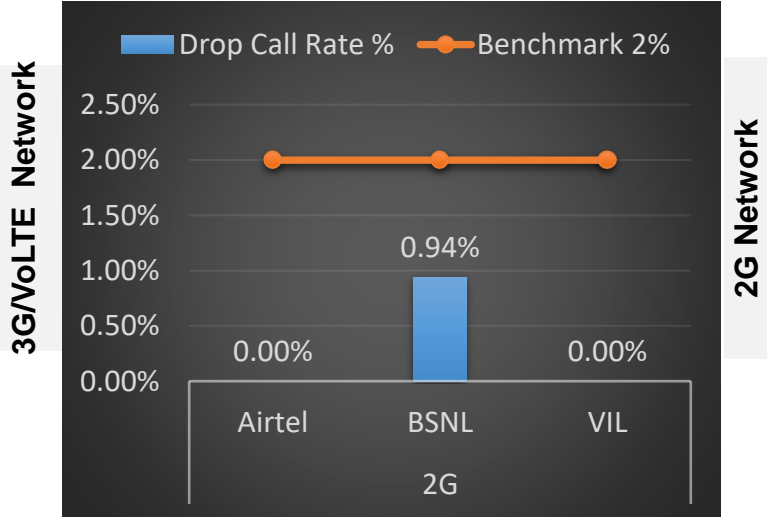| Date	Test Scenario	Area to be Covered
23-Nov-22	2G/4G Voice and 4G Dynamic Data	Starting point Place Delhi Bypass at 9 AM Rohtak to Rewari Highway and Nearby Area (Include Dynamic data test of 3G/4G)

Voice Calls

QoS compliance of the TSPs on Rohtak-Rewari Highway and Nearby Areas for Voice across technologies 2G/3G/4G-VoLTE :
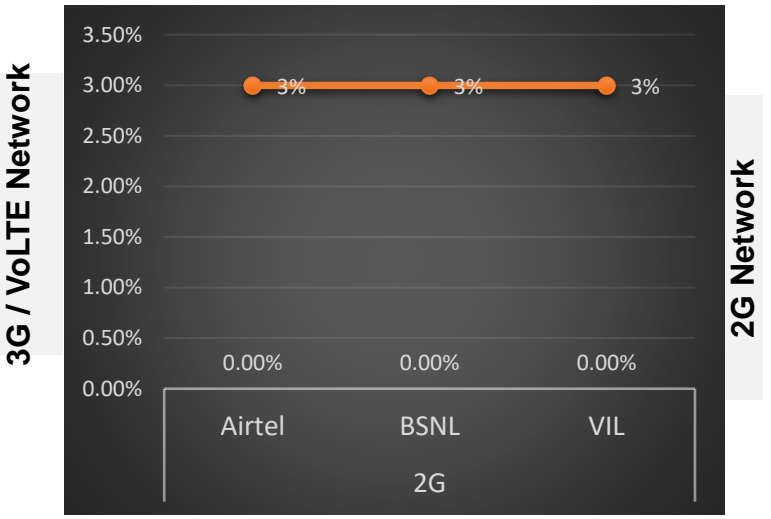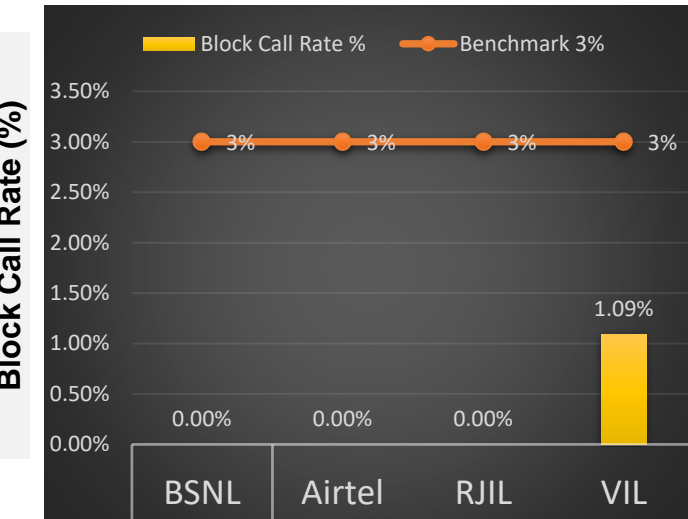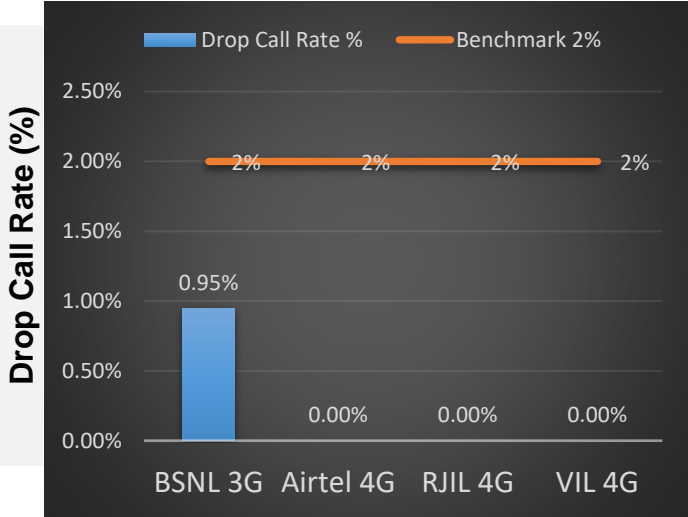
KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0.00%	0.94%	0.00%	0.95%	0.00%	0.00%	0.00%
Block Call Rate %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.09%

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

Coverage

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

TSPs	2G		
	Airtel	**BSNL**	**VIL**
Coverage %	**93.81%**	**96.94%**	**96.00%**

b) Percentage of coverage samples for 3G ≥ -90 dBm

TSPs	3G
	BSNL
Coverage %	**92.63%**

c) Percentage of coverage samples for LTE ≥ -110 dBm.

TSPs	VoLTE		
	Airtel	**JIO**	**VIL**
Coverage %	**94.65%**	**98.69%**	**96.81%**

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

TSPs	3G	VoLTE		
	BSNL	**Airtel**	**JIO**	**VIL**
Time spent on 3G/4G Network %	**64.03%**	**100.00%**	**100.00%**	**88.60%**

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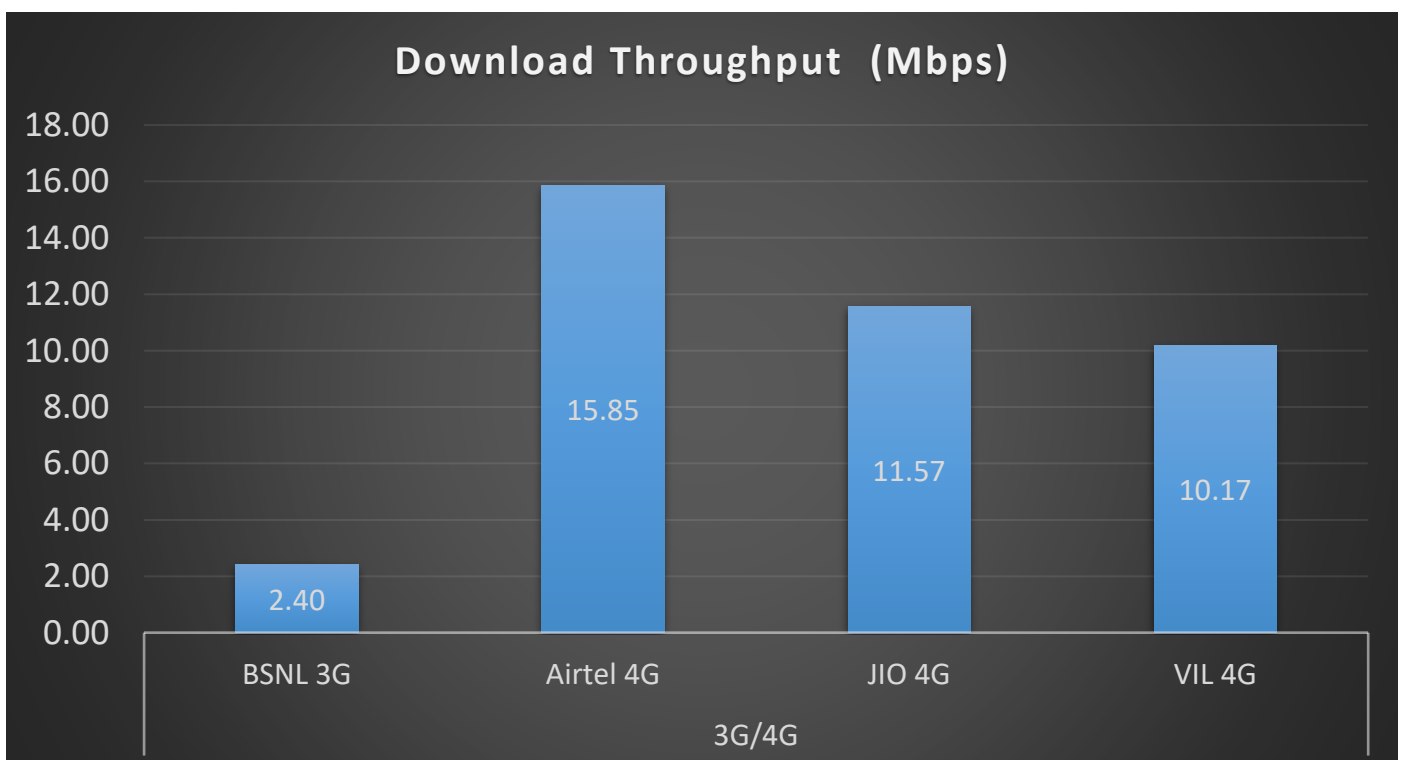
Dynamic Data was tested for whole voice route. Download Throughput was tested.

Data Download Performance (mbps) - Dynamic

3G/4G/ Network:

Data Services Dynamic	3G/4G			
	BSNL 3G	**Airtel 4G**	**JIO 4G**	**VIL 4G**
Download Throughput (Mbps)	**2.40**	**15.85**	**11.57**	**10.17**

Summary

Voice Call	2G		
	Airtel	**BSNL**	**VIL**
Call Attempt	108	106	108
Blocked Call Rate (%)	0.00%	0.00%	0.00%
CSSR% (Accessibility)	100.00%	100.00%	100.00%
Drop Call Rate (%)	0.00%	0.94%	0.00%
Mobility HOSR (%)	96.73%	100.00%	96.08%
Rx Quality (%)	96.74%	98.81%	97.00%
Average CST Sec	3.89	3.12	3.07

Voice Call	3G/VoLTE			
	BSNL 3G	**Airtel VoLTE**	**JIO VoLTE**	**VIL VoLTE**
Call Attempt	105	106	104	109
Blocked Call Rate (%)	0.00%	0.00%	0.00%	1.09%
CSSR% (Accessibility)	100.00%	100.00%	100.00%	98.91%
Drop Call Rate (%)	0.95%	0.00%	0.00%	0.00%
Mobility HOSR (%)	99.77%	99.83%	99.63%	100.00%
Rx Quality (%)	**94.59%**	95.78%	**93.87%**	**90.60%**
Average CST Sec	3.48	1.30	0.52	0.79

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 ≥ -110dBm. The details are as follows.

TSP	Coverage Rate %
Airtel 2G	**93.81%**
BSNL 2G	**96.94%**
VIL 2G	**96.00%**
BSNL 3G	**92.63%**
Airtel VoLTE	**94.65%**
Jio VoLTE	**98.69%**
VIL VoLTE	**96.81%**
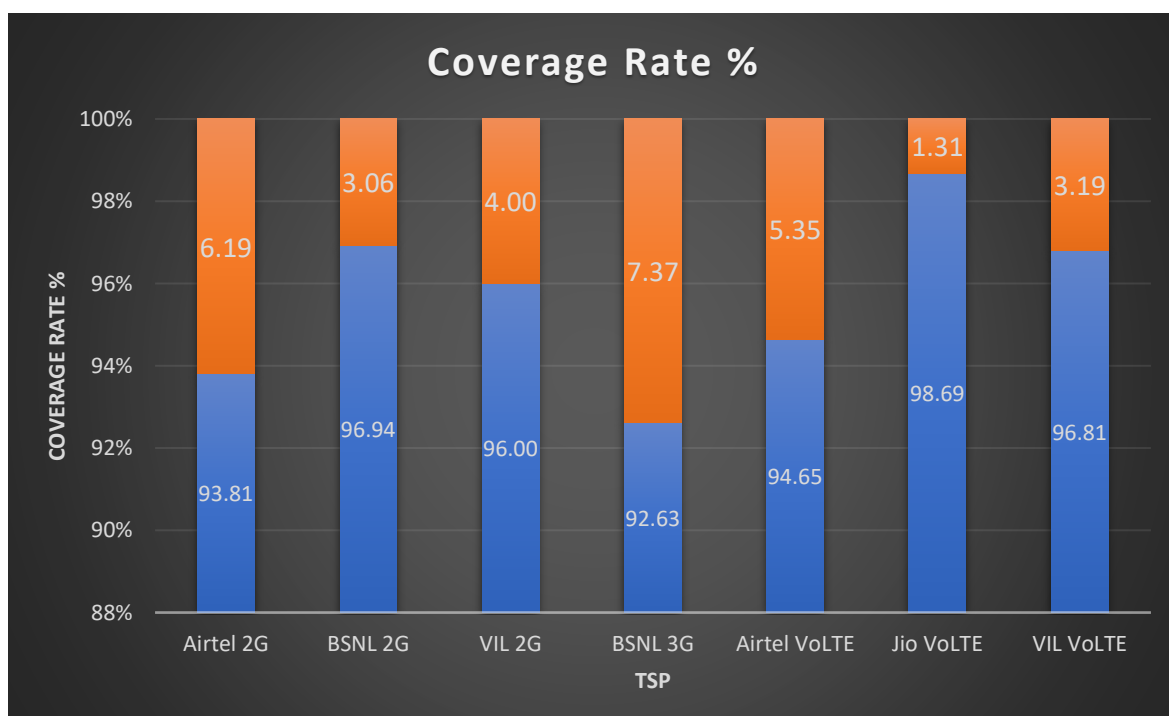
Coverage Rate %

TSP-AIRTEL

TSP	Coverage Rate %
Airtel 2G	93.81%
Airtel VoLTE	94.65%

2G

2G
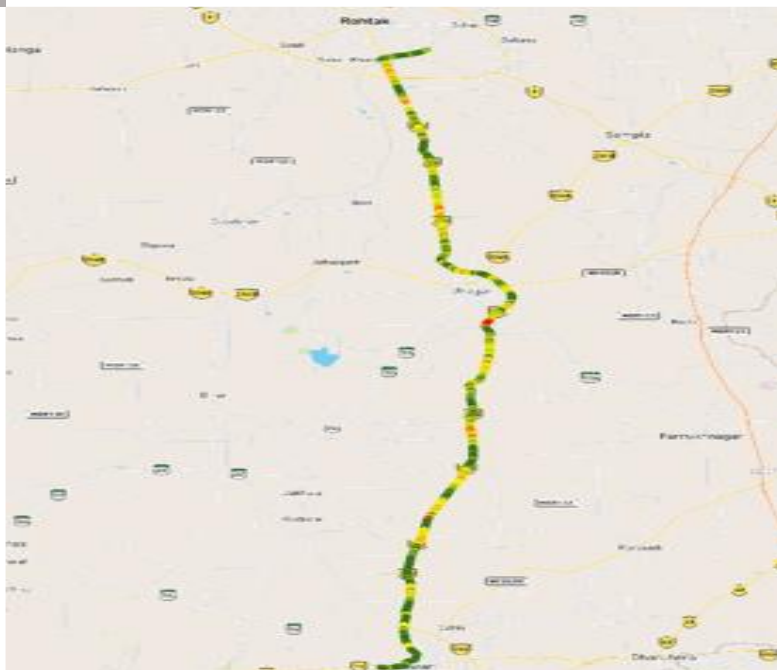
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	332519	72.11	🟩
[-75, >=-85)	9787	21.70	🟨
[-85, >=-95)	2579	5.71	🟧
[-95, >=Min)	211	0.46	🟥
Total		100%	

VoLTE

VoLTE

Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	5148	10.35	🟩
[-80, >=-90)	12824	25.78	🟨
[-90, >=-110)	29095	58.51	🟧
[-110, >=Min)	2659	5.34	🟥
Total		100%	

TSP- BSNL

TSP	Coverage Rate %
BSNL 2G	96.94%
BSNL 3G	92.63%

2G

2G
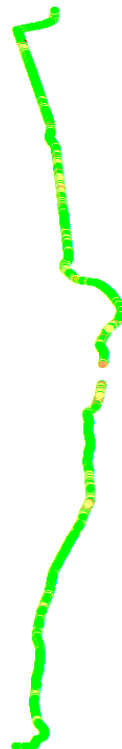
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	52844	83.94	🟩
[-75, >=-85)	8188	13.01	🟨
[-85, >=-95)	1875	2.98	🟧
[-95, >=Min)	51	0.08	🟥
Total	**62958**	**100%**	

3G

3G

Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	48066	76.35	🟩
[-70, >=-80)	5241	8.32	🟨
[-80, >=-90)	5012	7.96	🟧
[-90, >=Min)	4639	7.37	🟥
Total	**62958**	**100%**	

JIO

Technology	Coverage %
VoLTE	98.69%
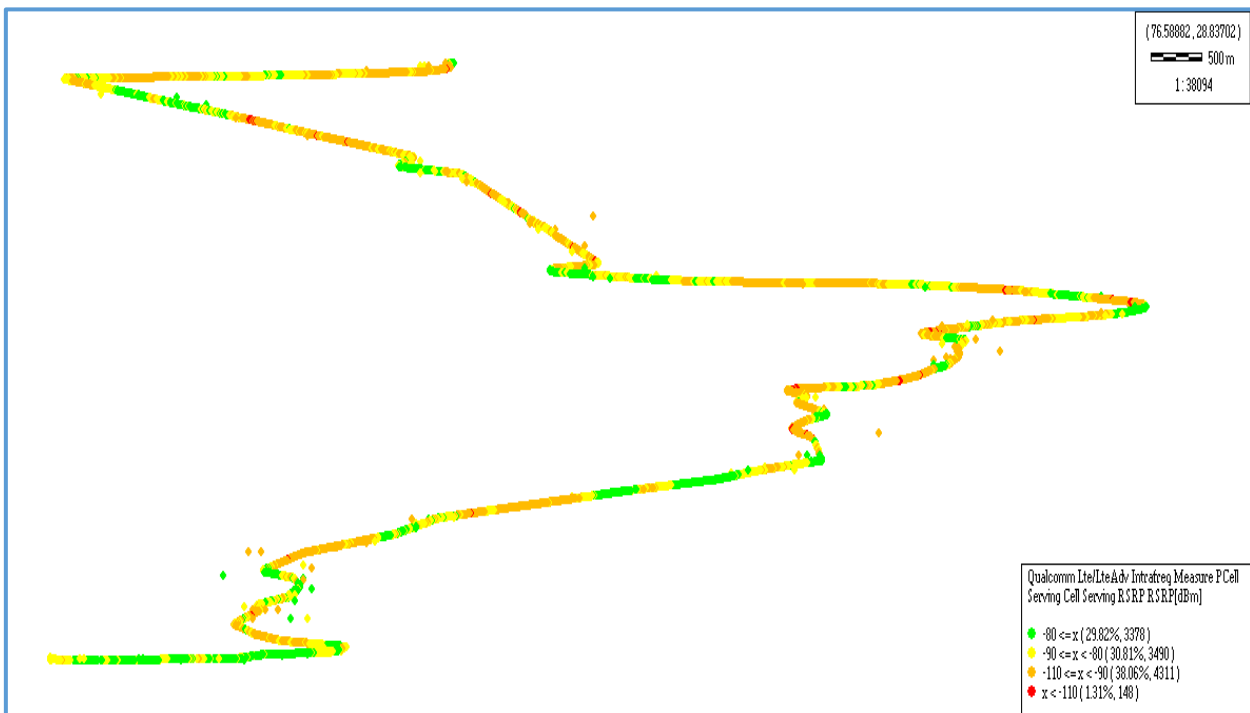
VoLTE

Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	3378	29.82	
[-80, >=-90)	3490	30.81	
[-90, >=-110)	4311	38.06	
[-110, >=Min)	148	1.31	
Total	**11327**	**100%**	

VIL

Technology	Coverage Rate %
2G	97.00%
VoLTE	90.60%

2G

2G
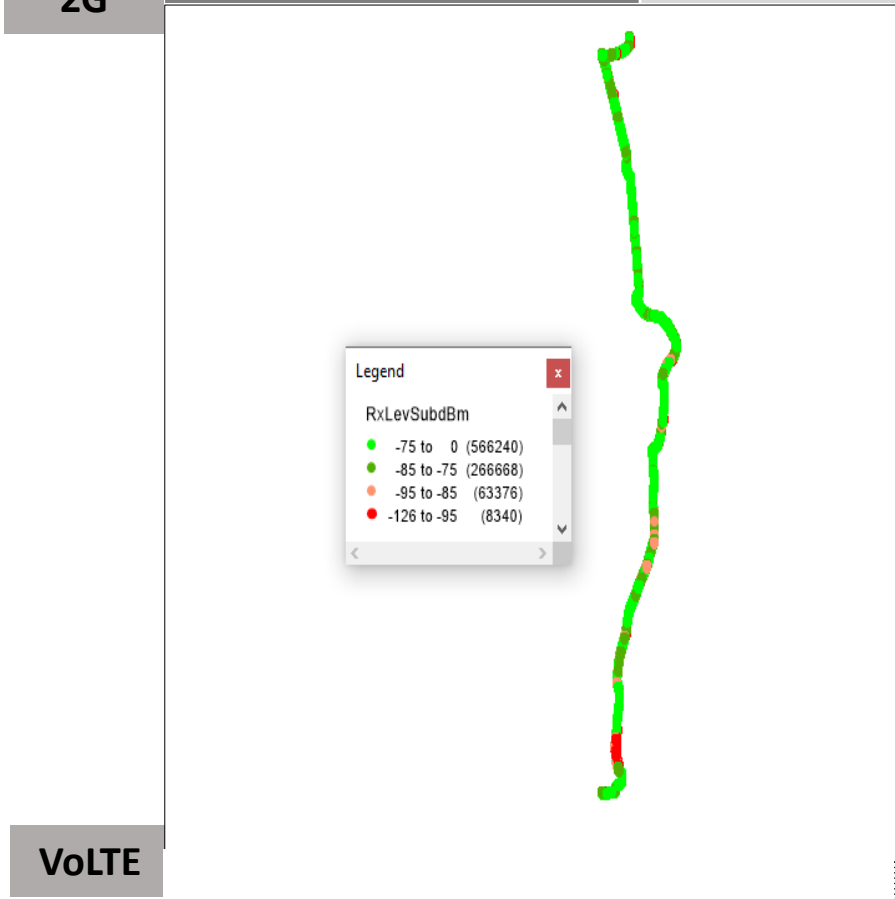
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	566240	63	
[-75, >=-85)	269102	33	
[-85, >=-95)	60841	3	
[-95, >=Min)	8340	1	
Total		100%	

VoLTE

VoLTE

Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	790	13.84	
[-80, >=-90)	1417	24.83	
[-90, >=-110)	3318	58.14	
[-110, >=Min)	182	3.19	
Total		100%	

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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.

TSP	Rx Quality %
Airtel 2G	96.74%
BSNL 2G	98.81%
VIL 2G	97.00%
BSNL 3G	94.59%
Airtel VoLTE	95.78%
Jio VoLTE	93.87%
VIL VoLTE	90.60%
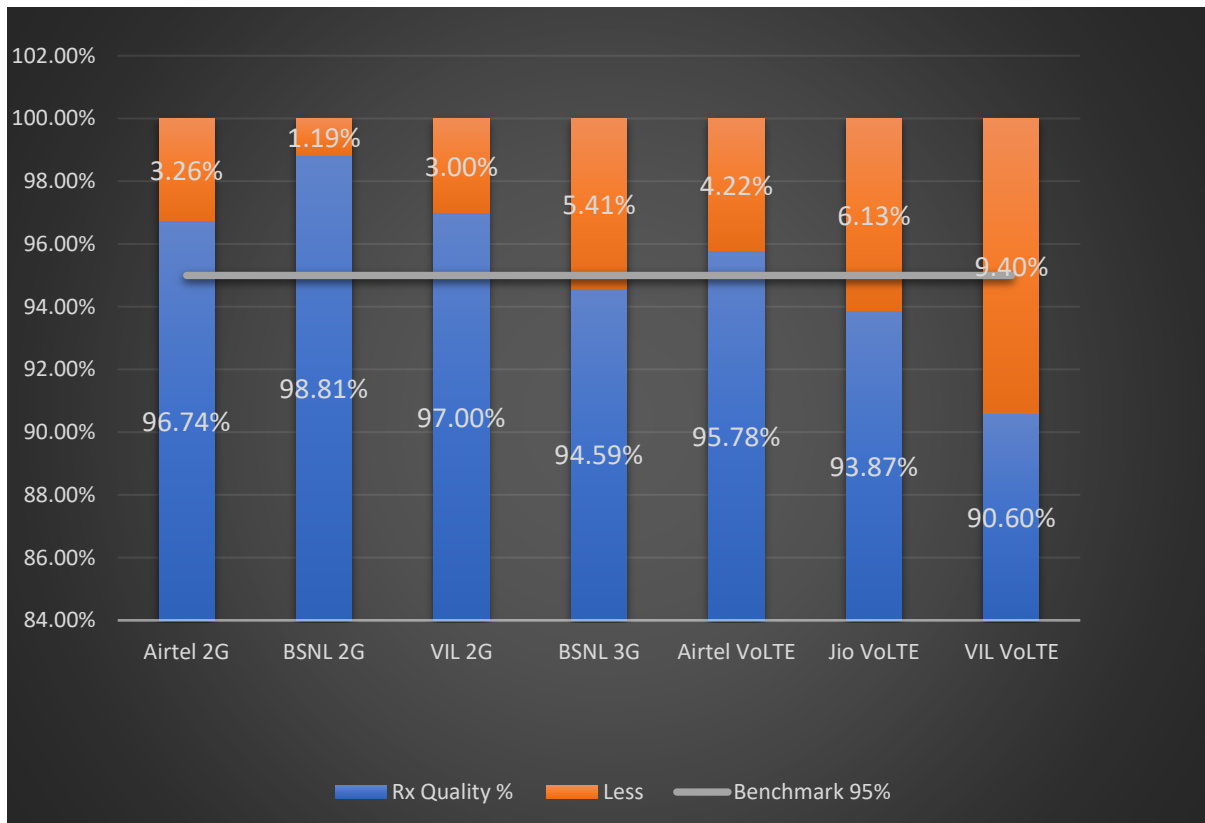
Airtel

Technology	Rx Quality %
2G	96.74%
VoLTE	95.78%

2G
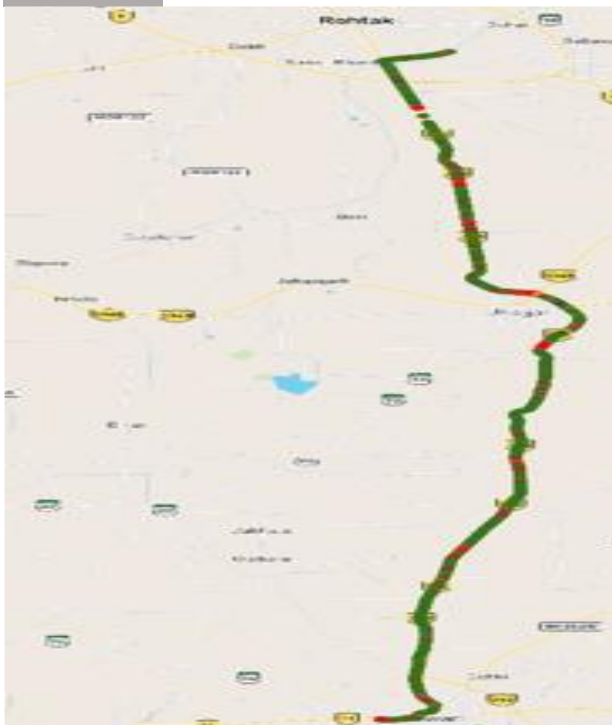
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	40562	93.44	
(2, <=3)	388	0.89	
(3 , <=4)	543	1.25	
(4 , <=5)	501	1.55	
(5 , <=Max)	1413	3.25	
Total		100%	

VoLTE

Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	2093	4.21	
(0, <=5)	22657	45.64	
(5, <=10)	15335	30.89	
(10, <=15)	5916	11.91	
(15, <=Max)	3638	11.91	
Total	49639	100%	

BSNL

Technology	Rx Quality %
2G	98.81
3G	94.59

2G

Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	60840	96.64	🟩
(2, <=3)	479	0.76	🟨
(3 , <=4)	487	0.77	🟦
(4 , <=5)	400	0.64	🟧
(5 , <=Max)	752	1.19	🟥
Total	62958	100%	

3G

Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	47004	74.66	🟩
(-6, <=-9)	2783	4.42	🟨
(-9, <=-11)	4882	7.75	🟦
(-11, <=-14)	4885	7.76	🟧
(-14, <= Min)	3404	5.41	🟥
Total	62958	100%	

For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -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 ≥ 95%.

JIO

Technology	Rx Quality %
VoLTE	93.87
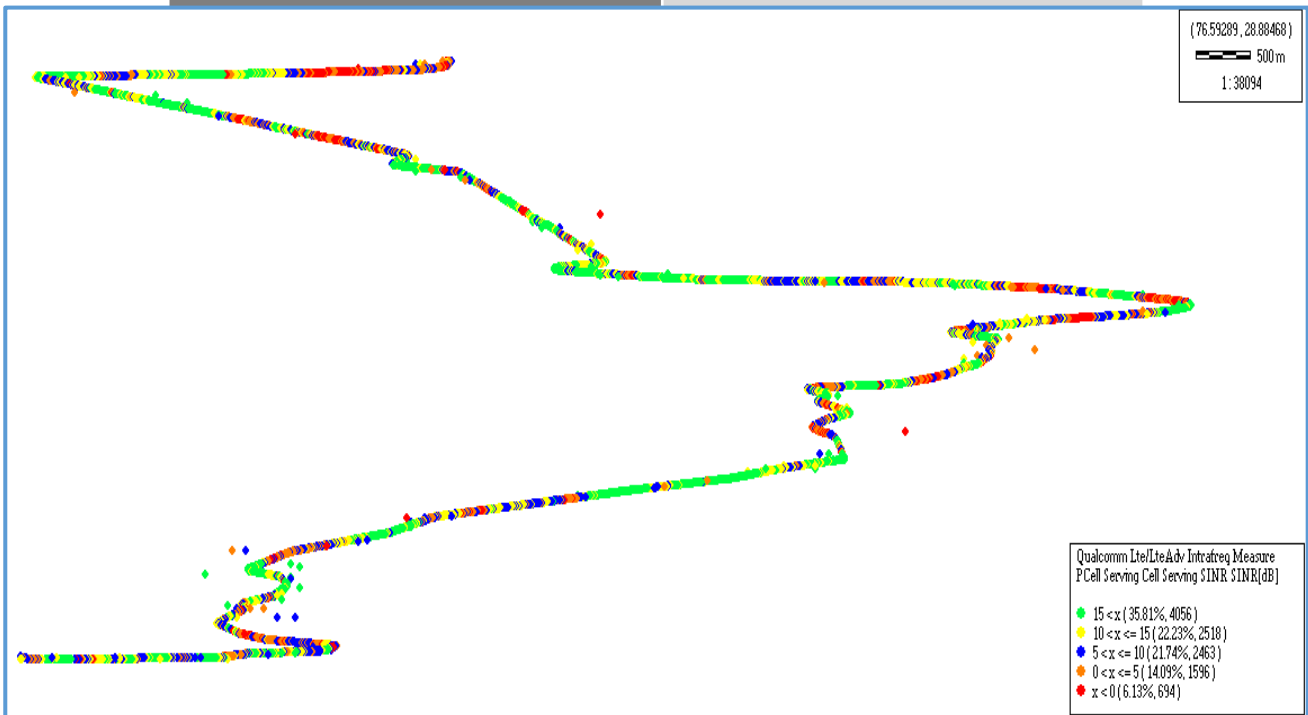
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	694	6.13	
(0, <=5)	1596	14.09	
(5, <=10)	2463	21.74	
(10, <=15)	2518	22.23	
(15, <=Max)	4056	35.81	
Total	11327	100%	

VIL

Technology	Rx Quality %
2G	97.00%
4G	**90.60%**

2G

Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	735511	82%	
(2, <=3)	26028	3%	
(3 , <=4)	54277	6%	
(4 , <=5)	54278	6%	
(5 , <=Max)	34530	3%	
Total	904624	100%	

VoLTE

Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	531.4	9.313	
(0, <=5)	1601.24	28.06	
(5, <=10)	1527.24	26.77	
(10, <=15)	1104.12	19.35	
(15, <=Max)	942	16.51	
Total		100%	
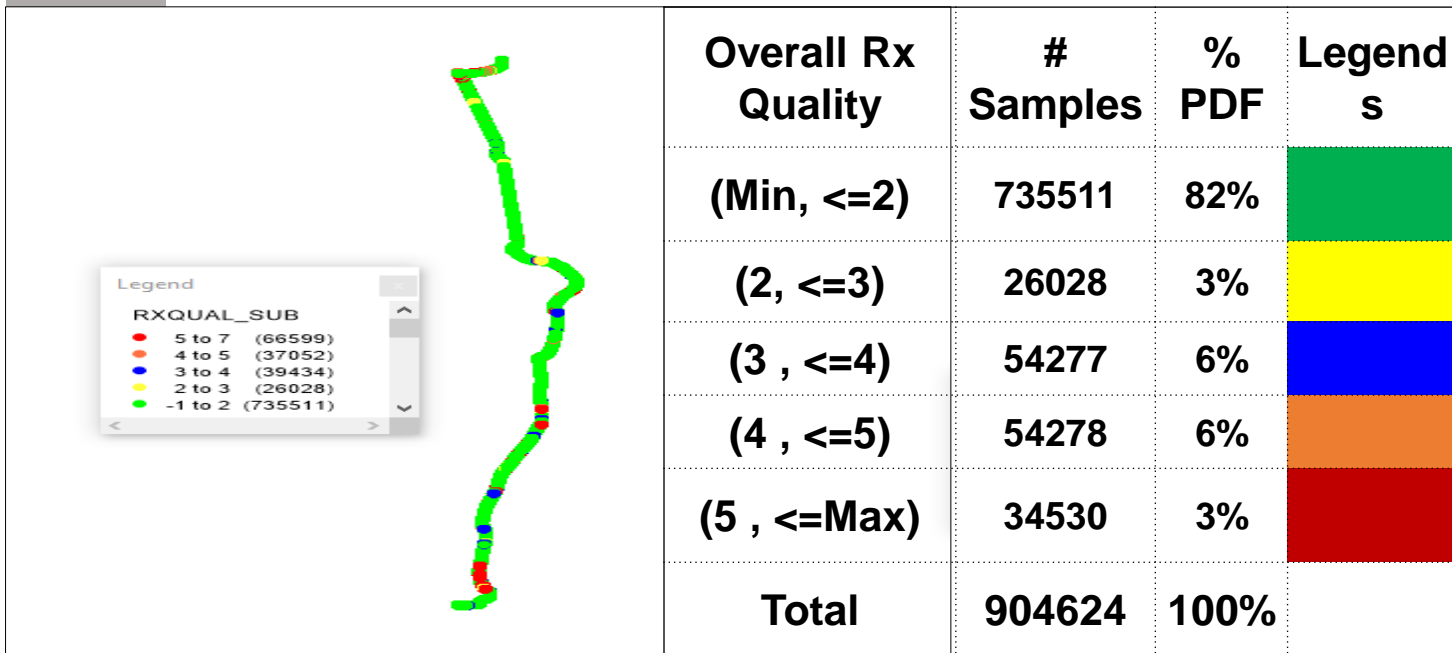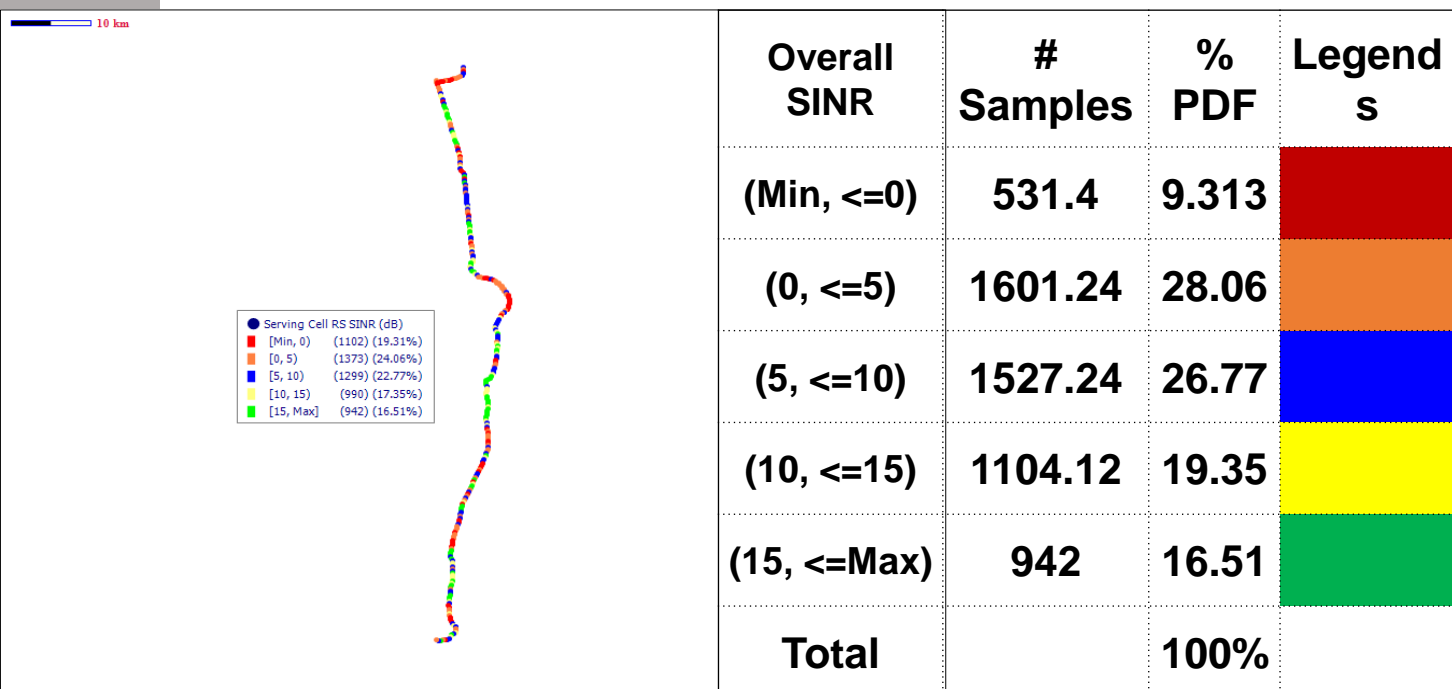
TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	**64.03%**
Airtel VoLTE	**100.00%**
Jio VoLTE	**100.00%**
VIL VoLTE	**88.60%**

Technology Distribution

Legend: ■ % of Time Spent on 3G/VoLTE ■ % Time Spend on 2G

- BSNL 3G: 64.03% (blue), 35.97% (orange)
- Airtel VoLTE: 100.00% (blue), 0.00% (orange)
- Jio VoLTE: 100.00% (blue), 0.00% (orange)
- VIL VoLTE: 88.60% (blue), 11.40% (orange)