



Operator Assisted Drive Test Report

Pathankot Highway Via Amritsar, Jalandhar, Dasuya & Mukerian

24th Aug. 2024

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 Pathankot Highway Via Amritsar, Jalandhar, Dasuya & Mukerian from 9:00 AM to 8:00 PM on 24th August 2024. The drive test covered drive route of 307 KMs over a period of 1 day. Approximately 265 calls were made for each of the 2G&3G networks : three 2G networks, one 3G networks and three LTE /5G networks covering four TSPs

Overview

Voice
Summary

Data
Summary

Overview

Regional Office, TRAI Jaipur conducted Operator Assisted Drive Test on 24th August 2024 covering Pathankot highway via Amritsar, Jalandhar, Dasuya & Mukerian. The performance of, Vodafone Idea was monitored across various technologies (2G 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 307 KMs. Approximately 265 (2G & 4G) calls were made for each of the 2G & 4G networks.

Data Tests:

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

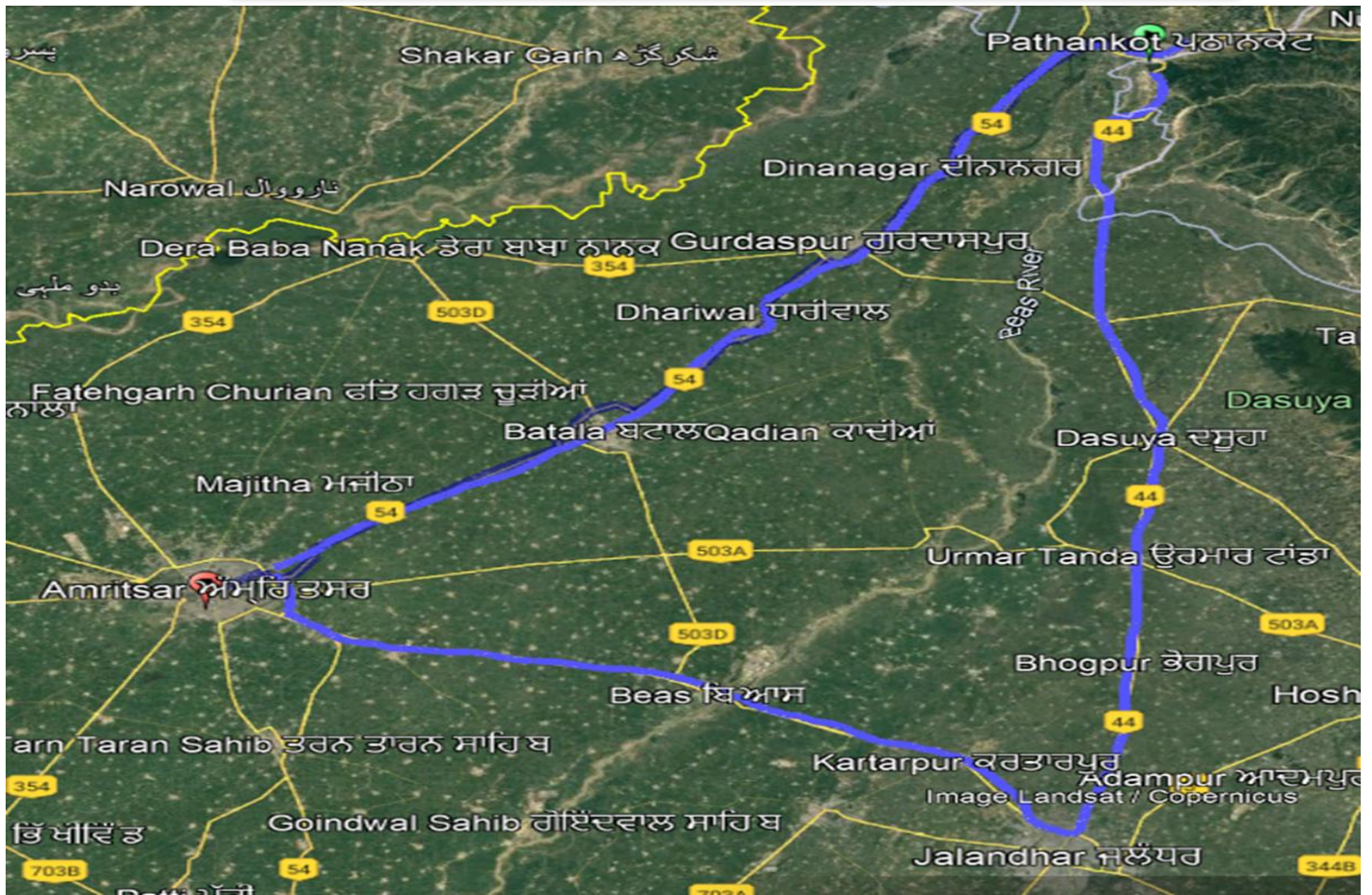
3G – measurement – UE in 3G File Size- 20MB

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

Static data tests

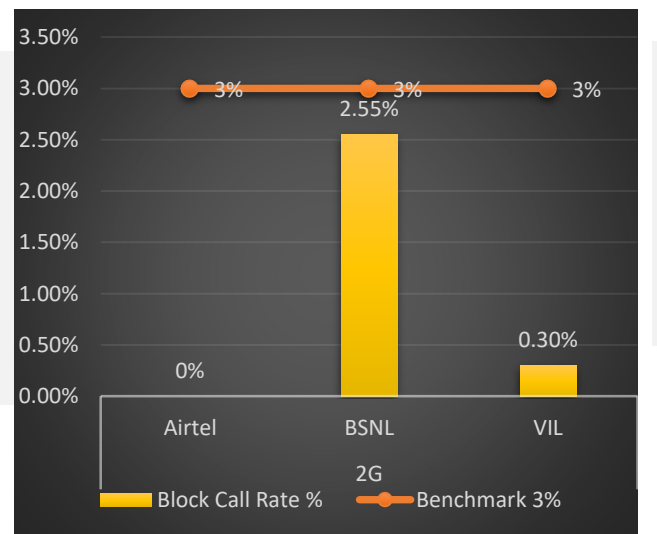
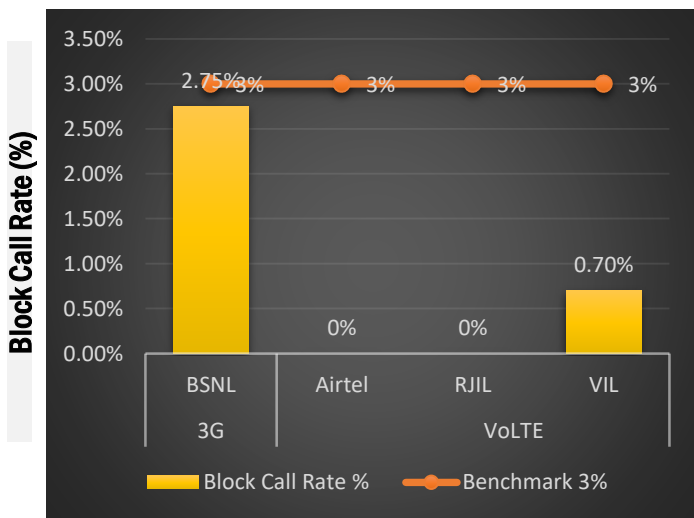
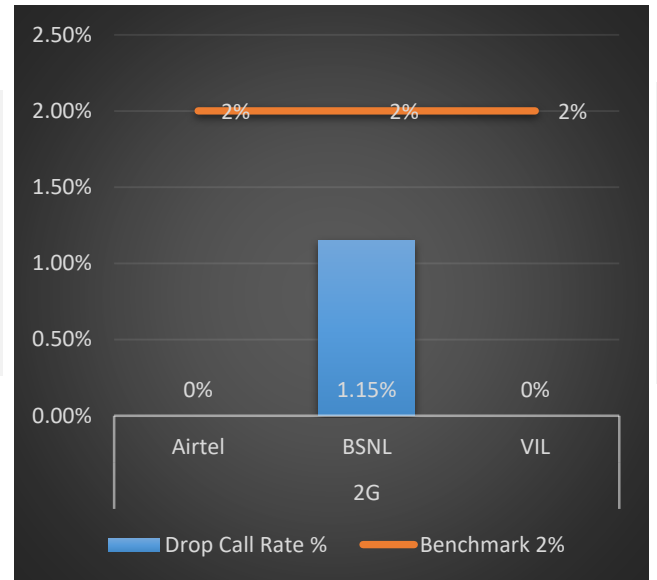
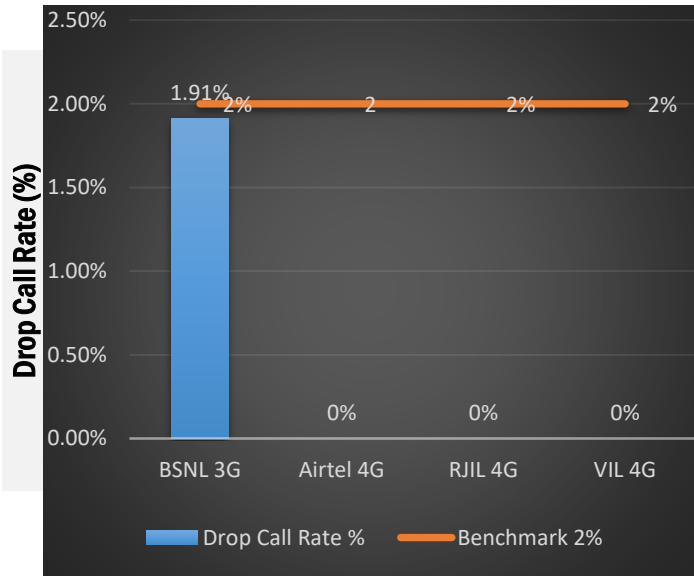
Service	Specifications
Download	2G (Locked) - 500KB, 3G (Dual) - 20 MB, 4G (Free) - 40 MB
Upload	2G (Locked) - 100KB, 3G (Dual) - 5 MB, 4G (Free) - 10 MB
Web Browsing	3 links of e/m commerce website www.amazon.in , www.flipkart.com and PayTm
Latency	32 Bytes on www.google.com

Voice & Dynamic Data Test Drive Route



Date	Test Scenario	Area to be Covered
24/11/2023	2G/3G/4G Voice and 3G/4G/5G Dynamic Data	FROM PATHANKOT-AMRTSAR-JALANDHAR-PATHANKOT

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



KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0%	1.15%	0%	1.91%	0%	0%	0%
Block Call Rate %	0%	2.55%	0.30%	2.75%	0%	0%	0.70%

- 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 %	95%	74.75%	92%

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

TSPs	3G
	BSNL
Coverage %	67.71%

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	99%	98.61%	100%

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

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	38.22%	99%	100%	100.00%

Data Services Dynamic

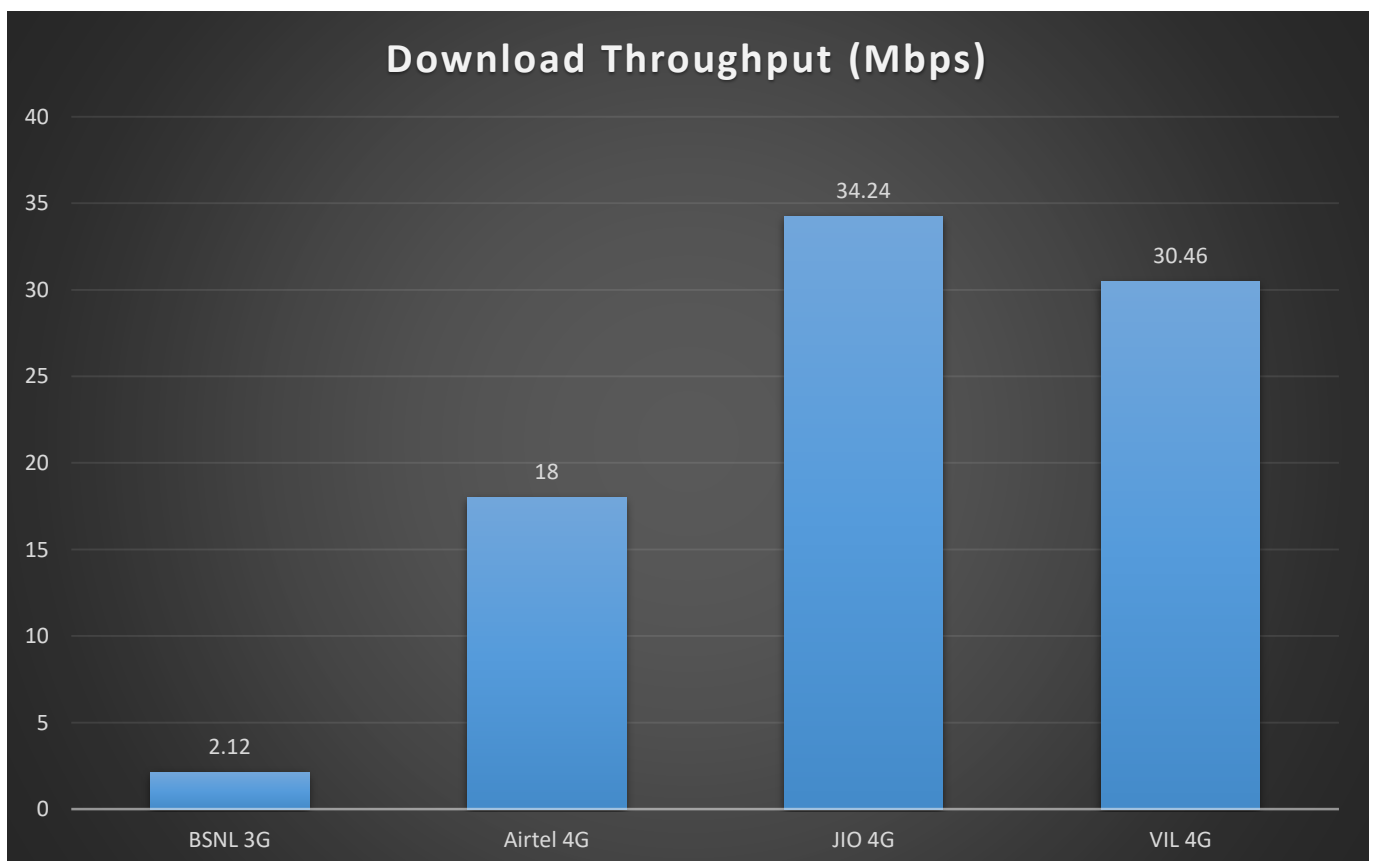
Key Observations

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)	2.12	18	34.24	30.46



Summary

City Level Summary- Voice

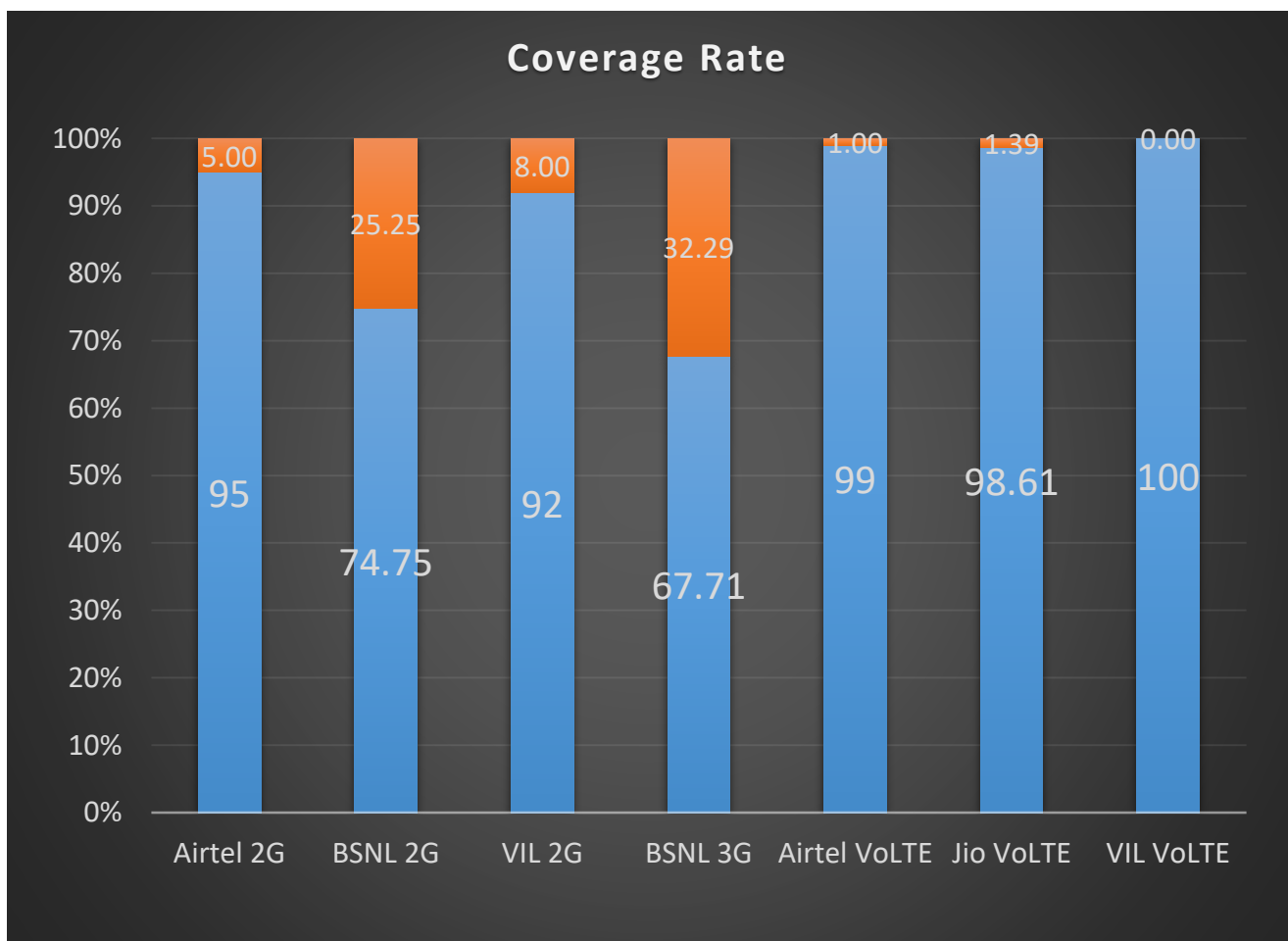
Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	264	261	266
Blocked Call Rate (%)	0%	2.55%	0.30%
CSSR% (Accessibility)	100%	97.45%	99.70%
Drop Call Rate (%)	0%	1.15%	0%
Mobility HOSR (%)	99.99%	97.6%	97.70%
Rx Quality (%)	93%	100%	95.70%
Average CST Sec	3.36	3.07	3.87

Voice Call	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	261	264	257	268
Blocked Call Rate (%)	2.75%	0%	0%	0.70%
CSSR% (Accessibility)	97.24%	100%	100%	99.30%
Drop Call Rate (%)	1.91%	0%	0%	0%
Mobility HOSR (%)	100%	99.99%	99.22%	100%
Rx Quality (%)	91.39%	89.50%	88.9%	87.30%
Average CST Sec	3.15	1.38	0.84	2.41

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	95%
BSNL 2G	74.75%
VIL 2G	92%
BSNL 3G	67.71%
Airtel VoLTE	99%
Jio VoLTE	98.61%
VIL VoLTE	100%



TSP-AIRTEL

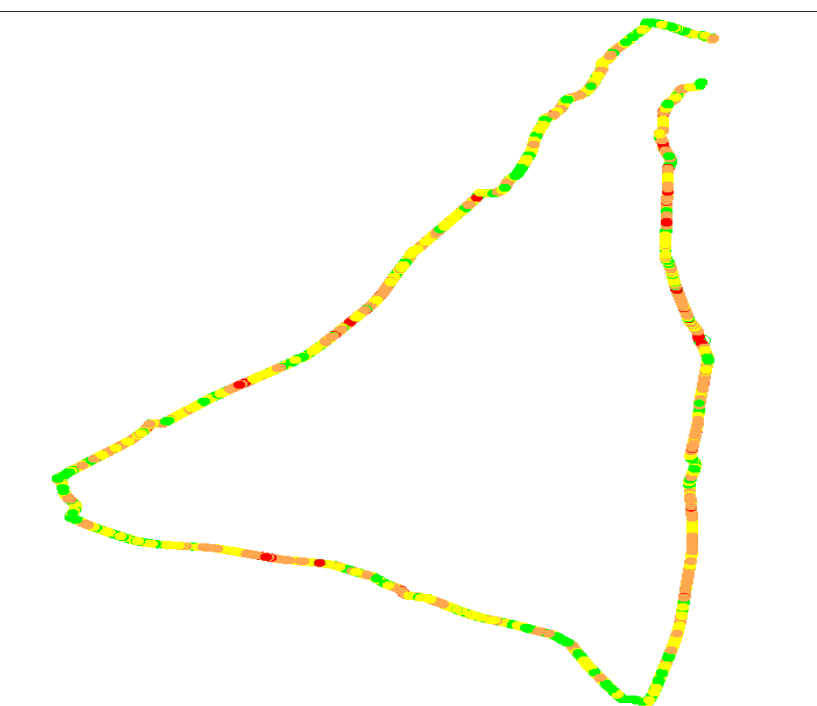
Technology	Coverage %
2G	95%
VoLTE	99%

2G



2G			
Overall RxLevel	# Samples	% PDF	Legend s
[Max, >=-75]	1397948	71%	Green
[-75, >=-85)	467666	24%	Yellow
[-85, >=-95)	104705	5%	Orange
[-95, >=Min)	4863	0%	Red
Total	1975182	100%	

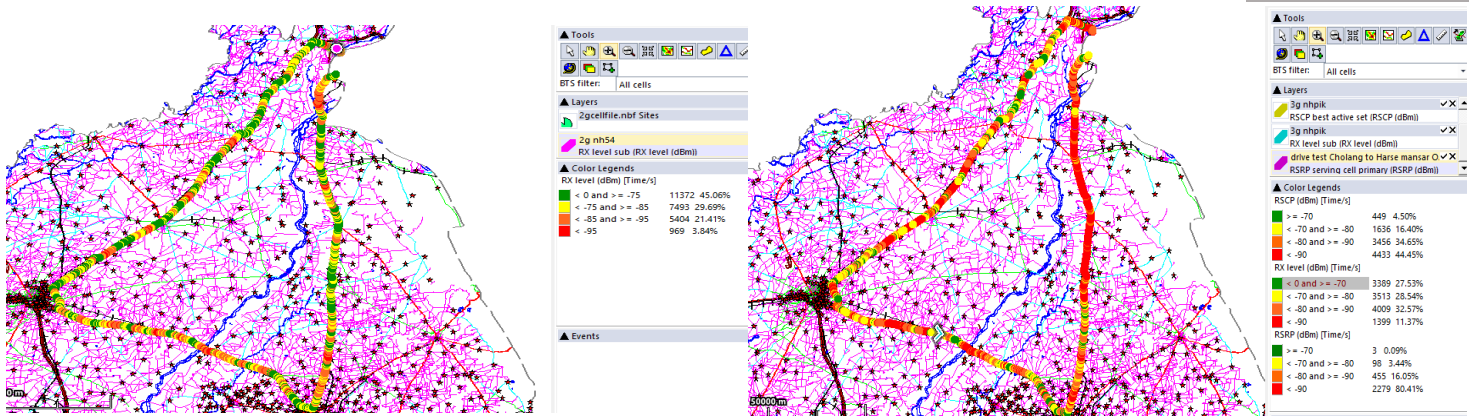
VoLTE



VoLTE			
Overall RSRP	# Samples	% PDF	Legend s
[Max, >=-80]	3132265	44%	Green
[-80, >=-90)	3465599	49%	Yellow
[-90, >=-110)	437368	6%	Orange
[-110, >=Min)	22118	1%	Red
Total	7057350	100%	

TSP- BSNL

	Technology	Coverage %
	2G	74.75%
2G	3G	67.71%
	3G	



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	11372	45.06%	
[-75, >=-85)	7493	29.69%	
[-85, >=-95)	5404	21.41%	
[-95, >=Min)	969	3.84%	
Total	25238	100%	

3G			
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	3841	15.29%	
[-70, >=-80)	5247	20.89%	
[-80, >=-90)	7920	31.53%	
[-90, >=Min)	8111	32.29%	
Total	25119	100%	

JIO

Technology	Coverage %
VoLTE	98.61%

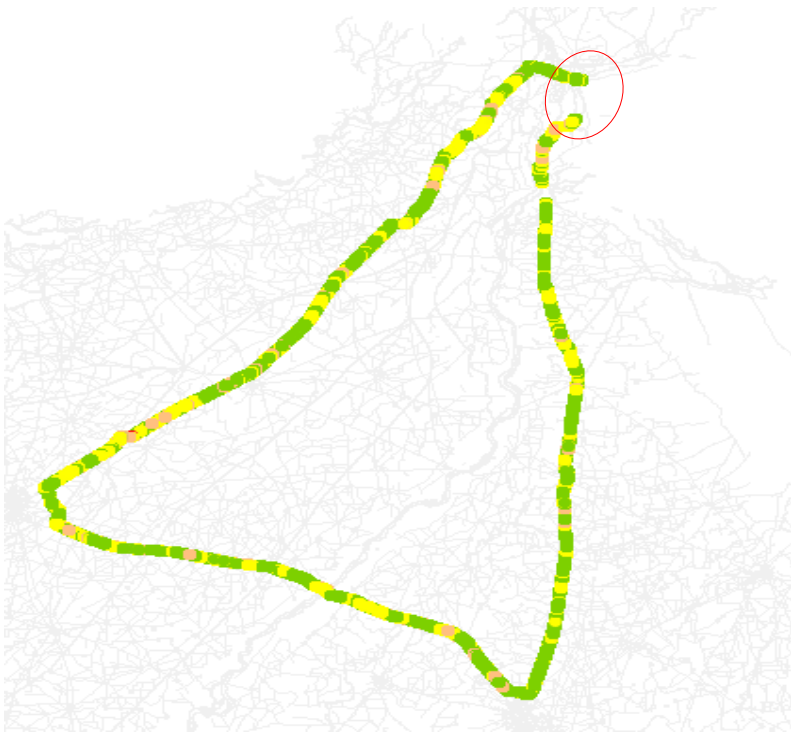


VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	8935	32.60%	
[-80, >=-90)	8179	29.85%	
[-90, >=-110)	9908	36.16%	
[-110, >=Min)	381	1.39%	
Total	27403	100%	

VIL

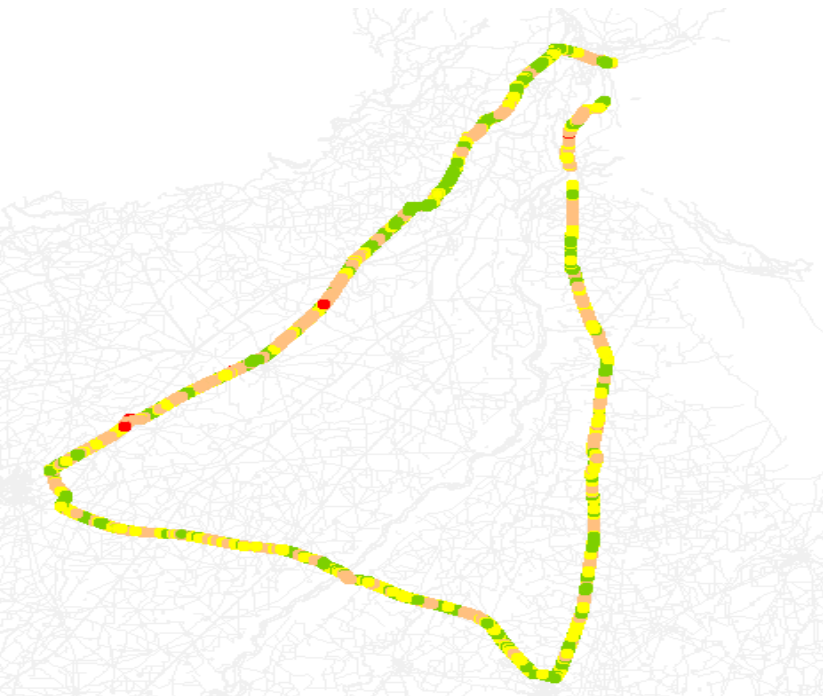
2G

Technology	Coverage Rate %
2G	92%
VoLTE	100%



2G			
Overall Rx Level	# Samples	% PDF	Legends
[Max, >=-75]	1185840	57%	
[-75, >=-85)	721247	35%	
[-85, >=-95)	172513	8%	
[-95, >=Min)	2054	0%	
Total	2081654	100%	

VoLTE

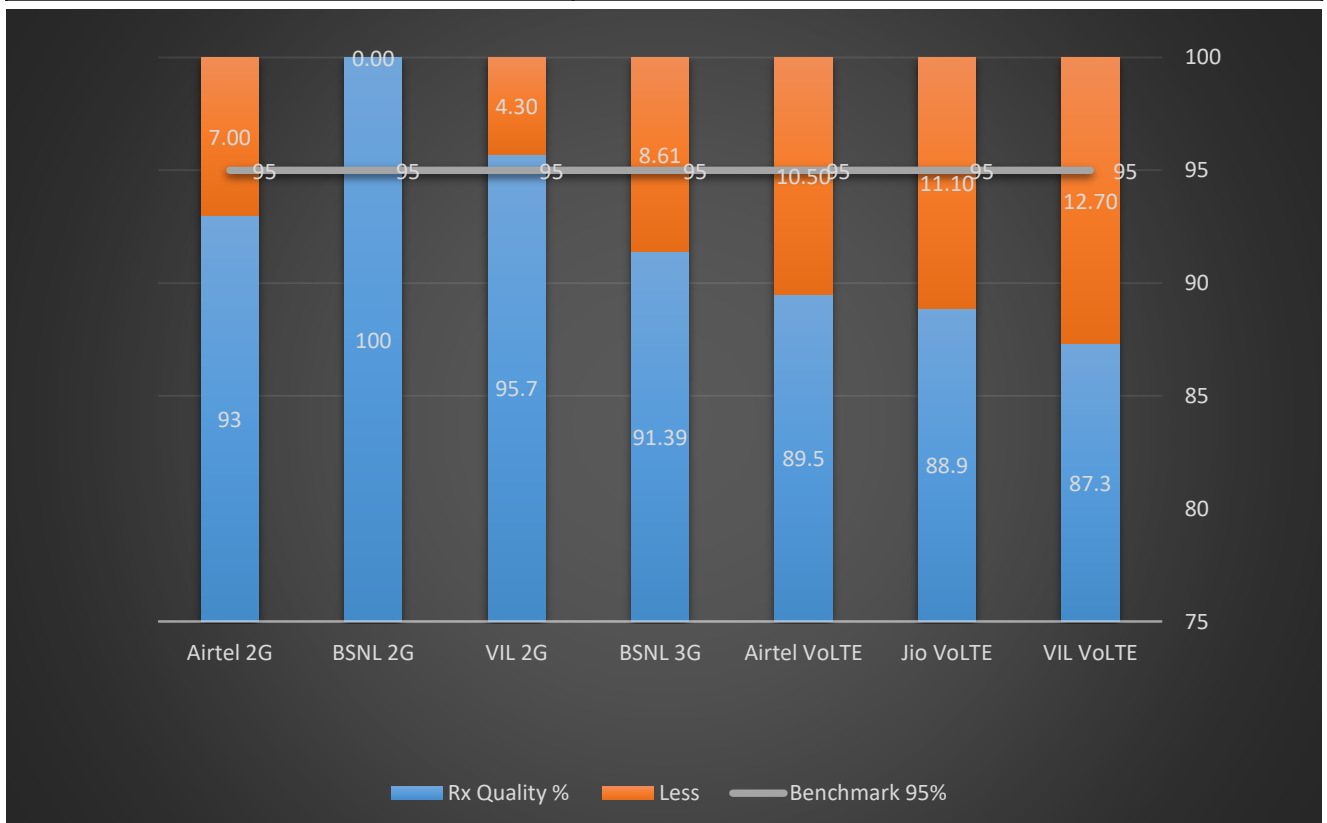


VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	1788161	29.3%	
[-80, >=-90)	1924621	31.5%	
[-90, >=-110)	2379276	38.9%	
[-110, >=Min)	20326	0.3%	
Total	6112384	100%	

II. Quality Details

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 $\geq 95\%$.

<u>TSP</u>	Rx Quality %
Airtel 2G	93%
BSNL 2G	100%
VIL 2G	95.7%
BSNL 3G	91.39%
Airtel VoLTE	89.5%
Jio VoLTE	88.9%
VIL VoLTE	87.3%



II. Quality Details

Airtel

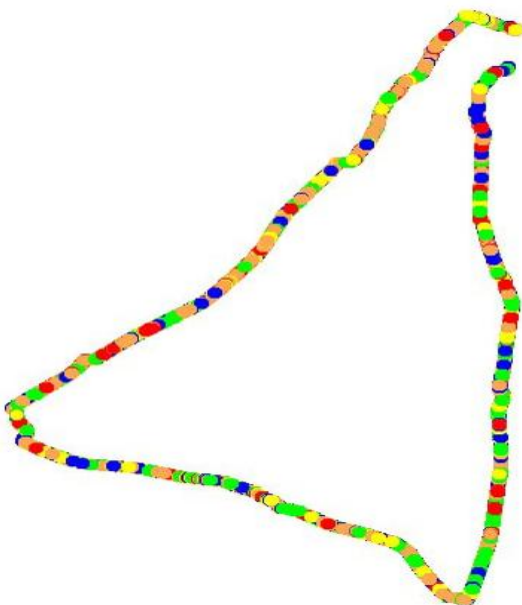
Technology	Rx Quality %
2G	93%
VoLTE	89.5%

2G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1711890	88%	Green
(2, <=3)	44372	2%	Yellow
(3, <=4)	45387	2%	Blue
(4, <=5)	43387	2%	Orange
(5, <=Max)	130146	6%	Red
Total	1975182	100%	

VoLTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	660849	11%	Red
(0, <=5)	504902	8%	Orange
(5, <=10)	592445	9%	Blue
(10, <=15)	429860	7%	Yellow
(15, <=Max)	4058155	65%	Green
Total	6246211	100%	

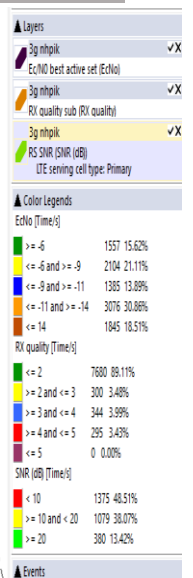
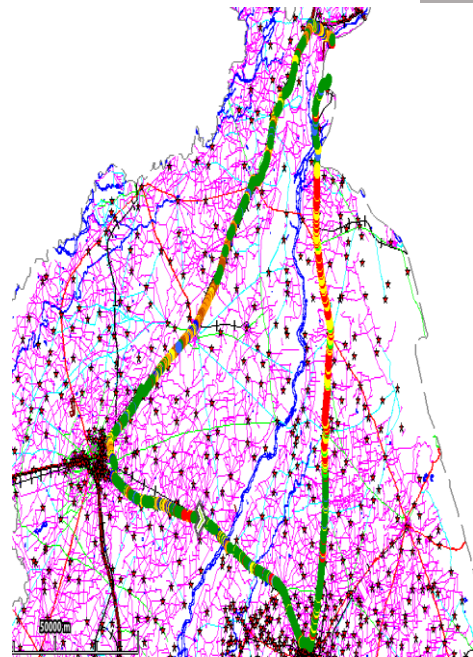
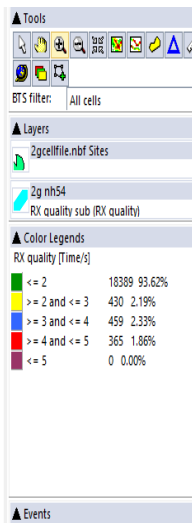
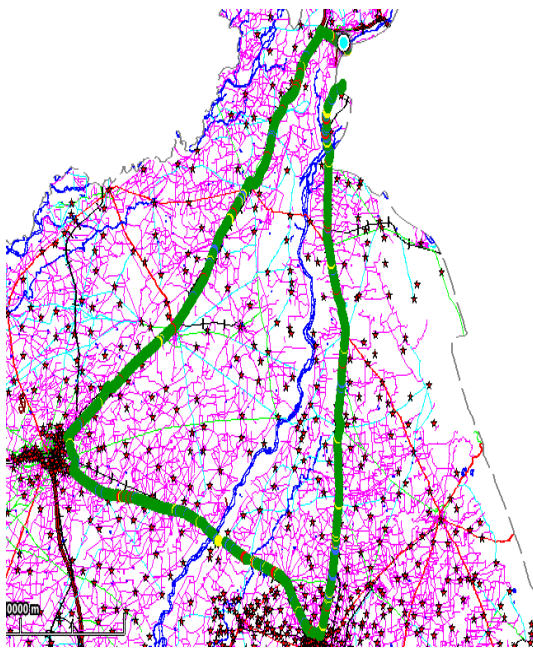
II. Quality Details

BSNL

Technology	Rx Quality %
2G	100%
3G	91.39%

2G

3G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	18389	93.62%	
(2, <=3)	430	2.19%	
(3, <=4)	459	2.33%	
(4, <=5)	365	1.86%	
(5, <=Max)	0	0%	
Total	19643	100%	

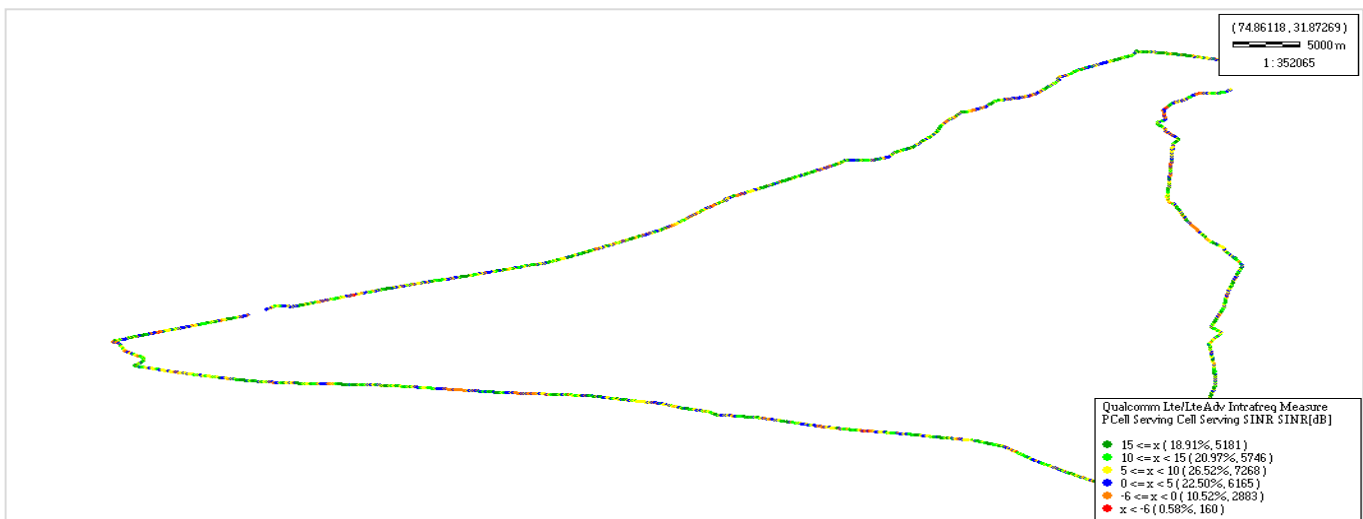
Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	10612	49.54%	
(-6, <=-9)	3483	16.26%	
(-9, <=-11)	2109	9.85%	
(-11, <=-14)	3371	15.74%	
(-14, <= Min)	1845	8.61%	
Total	21420	100%	

II. Quality Details

For measuring voice quality, as per the QoS norms, RxQual ≤ 5 for GSM TSPs, EcNo ≥ -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	88.9%



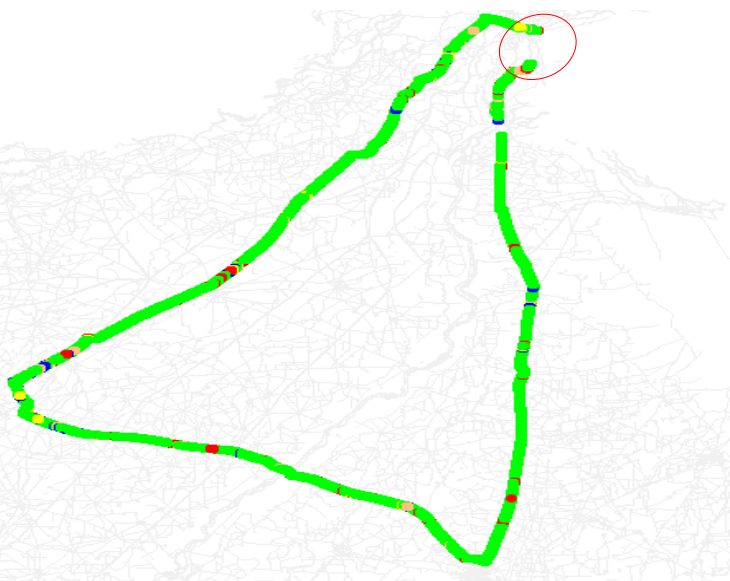
Overall SINR	# Samples	% PDF	Legends
(Min, ≤ -6)	160	0.58%	
$(-6, \leq 0)$	2883	10.52%	
$(0, \leq 5)$	6165	22.50%	
$(5, \leq 10)$	7268	26.52%	
$(10, \leq 15)$	5746	20.97%	
$(15, \leq \text{Max})$	5181	18.91%	
Total	27403	100%	

II. Quality Details

VIL

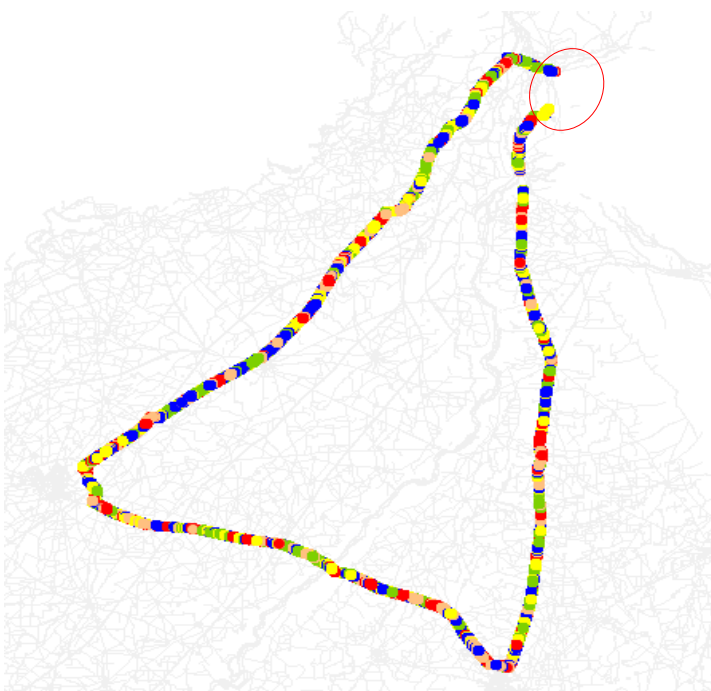
Technology	Rx Quality %
2G	95.7%
4G	87.3%

2G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	1827643	87.8%	Green
(2, <=3)	52236	2.5%	Yellow
(3, <=4)	58641	2.8%	Blue
(4, <=5)	53586	2.6%	Orange
(5, <=Max)	89548	4.3%	Red
Total	2081654	100%	

VoLTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	775937	12.7%	Red
(0, <=5)	1206293	19.7%	Orange
(5, <=10)	1466811	24.0%	Blue
(10, <=15)	1245618	20.4%	Yellow
(15, <=Max)	1417725	23.2%	Green
Total	6112384	100%	

III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	38.22%
Airtel VoLTE	99%
Jio VoLTE	100%
VIL VoLTE	100%

