



Operator Assisted Drive Test Report

Sikar to Sri Ganganagar Highway

24 Sep 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 in Sikar to Sri Ganganagar Highway from 9:00 AM to 8:00 PM during 24th Sep 2024. The drive test covered drive route of 360 KMs & no hotspots over a period of 1 days. Approximately 235 calls were made for each of the networks: three 2G networks, one 3G networks and three LTE /5G networks covering four TSPs.

Overview

Voice Summary

Data Summary

Overview

Regional Office, Jaipur TRAI conducted Operator Assisted Drive Test from covering Sikar to Sri Ganganagar 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 approximately 360 km . Approximately 235 calls were made for each of the Airtel.....networks: three 2G (Lock Mode) networks, two 3G (Dual mode) networks and three VoLTE /5G networks covering unique TSPs.

Data Tests:

Dynamic data test was conducted for ...360.. kms for download throughput in all technologies.

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

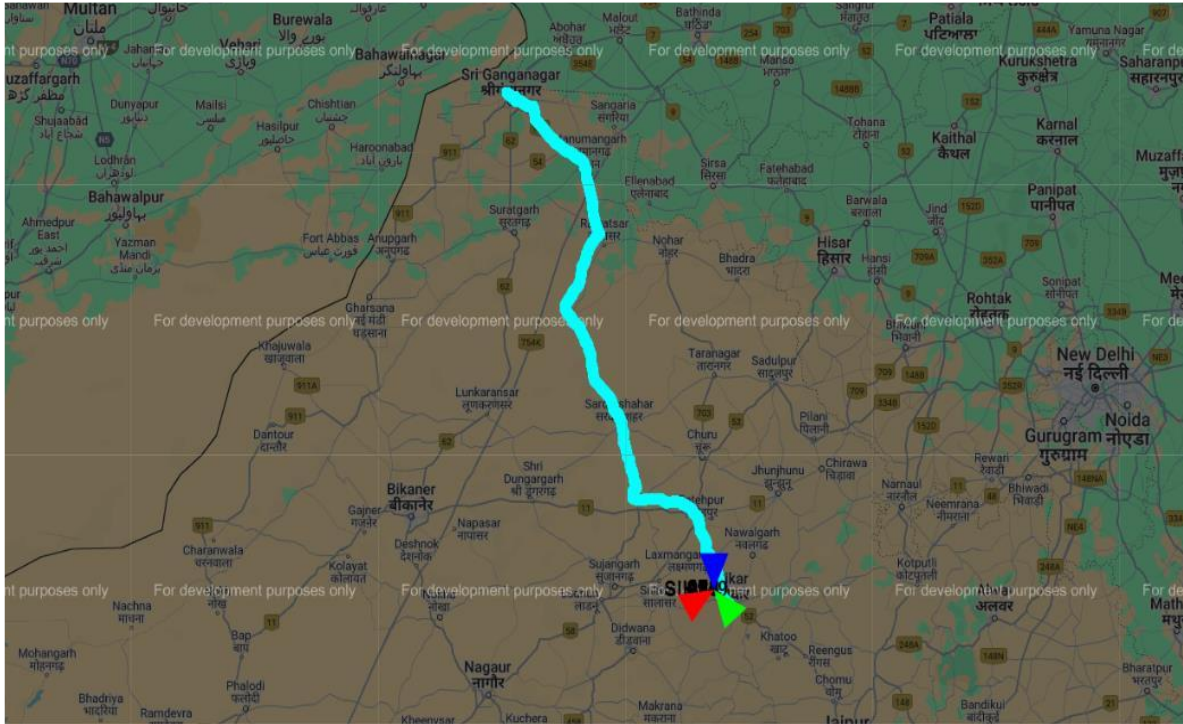
3G – measurement – UE in 3G File Size- 20MB

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 www.amazon.in, www.flipkart.com and PayTm
Latency	32 Bytes on www.google.com

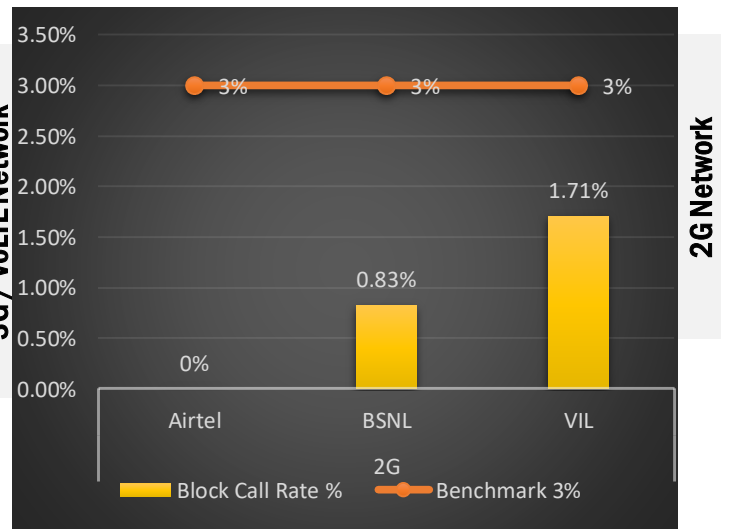
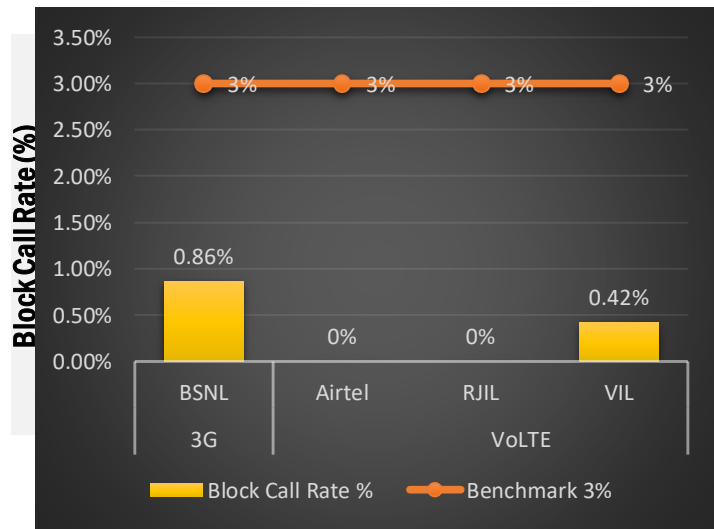
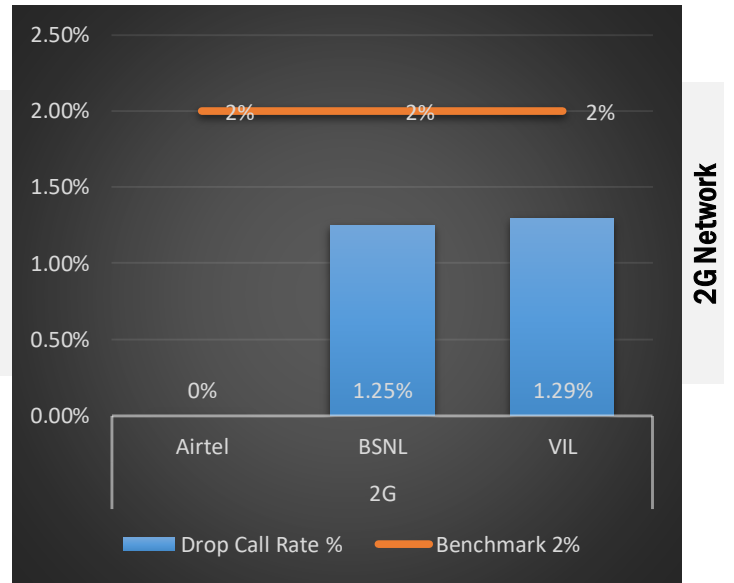
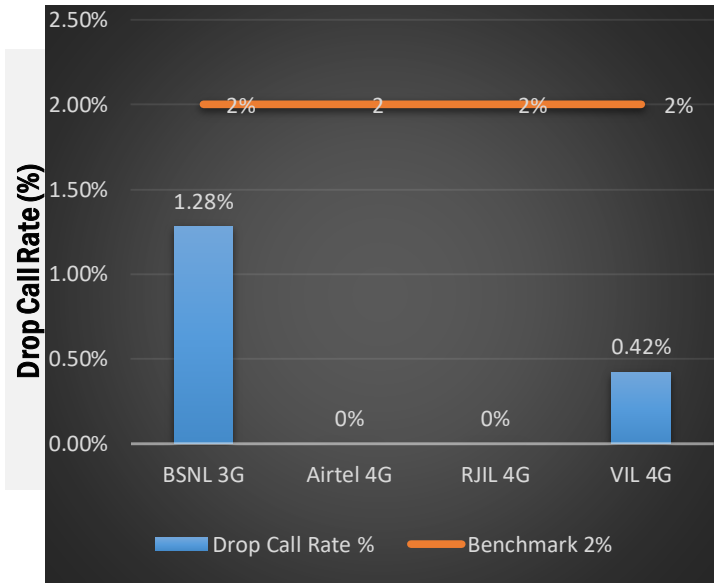
Overview

Voice & Dynamic Data Test Drive Route



Day	Date	Test Scenario	Area to be Covered	DT Route Plan
1	24-Sep	2G/4G Voice and 4G Dynamic Data	Sanwali Circle, Sikar to Sri Ganganagar	

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



KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0%	1.25%	1.29%	1.28%	0%	0%	0.42%
Block Call Rate %	0%	0.83%	1.71%	0.86%	0%	0%	0.42%

- 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 %	92.21%	62.84%	59.38%

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

TSPs	3G
	BSNL
Coverage %	46.28%

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	89.87%	96.95%	84.82%

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

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	38.94%	100%	100%	99.29%

Data Services Dynamic

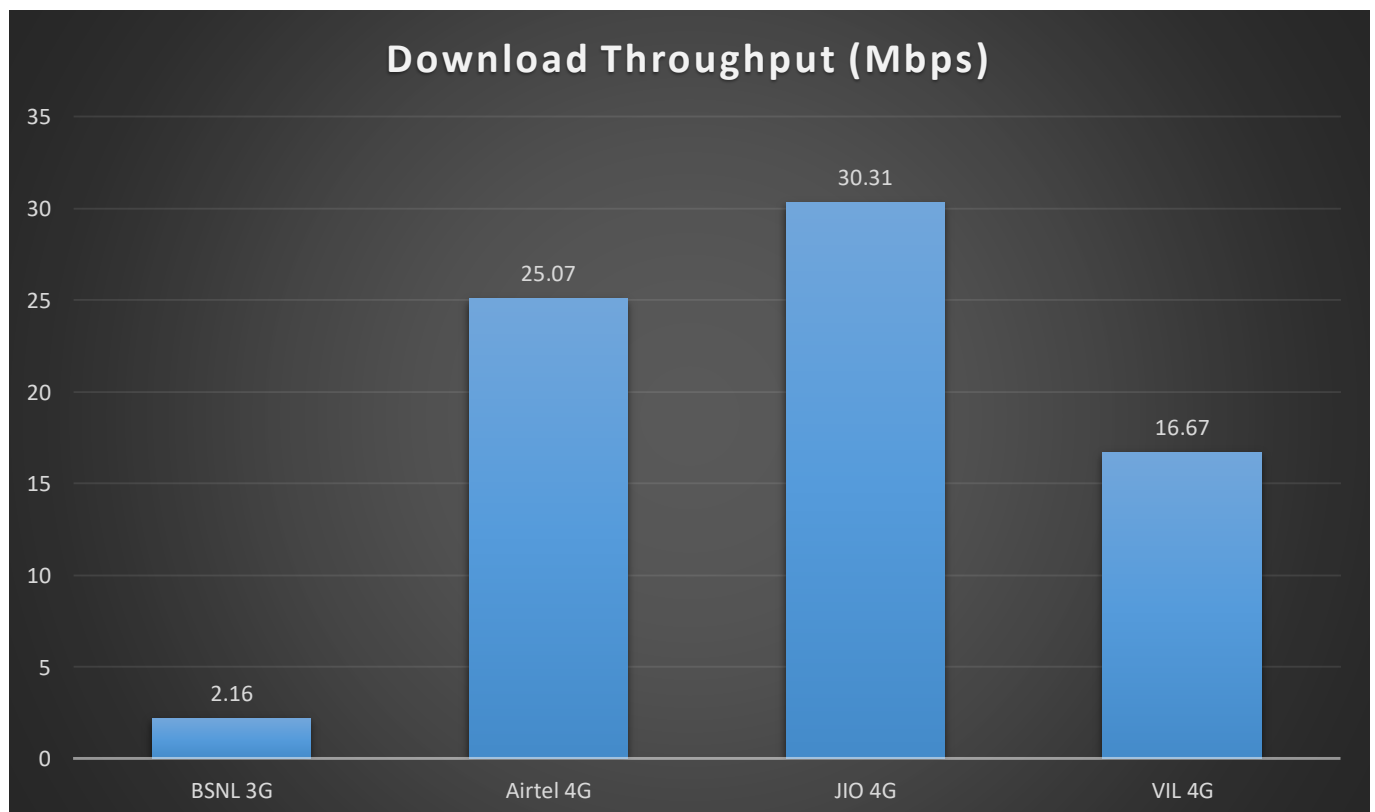
Key Observations

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)	2.16	25.07	30.31	16.67



Summary

City Level Summary- Voice

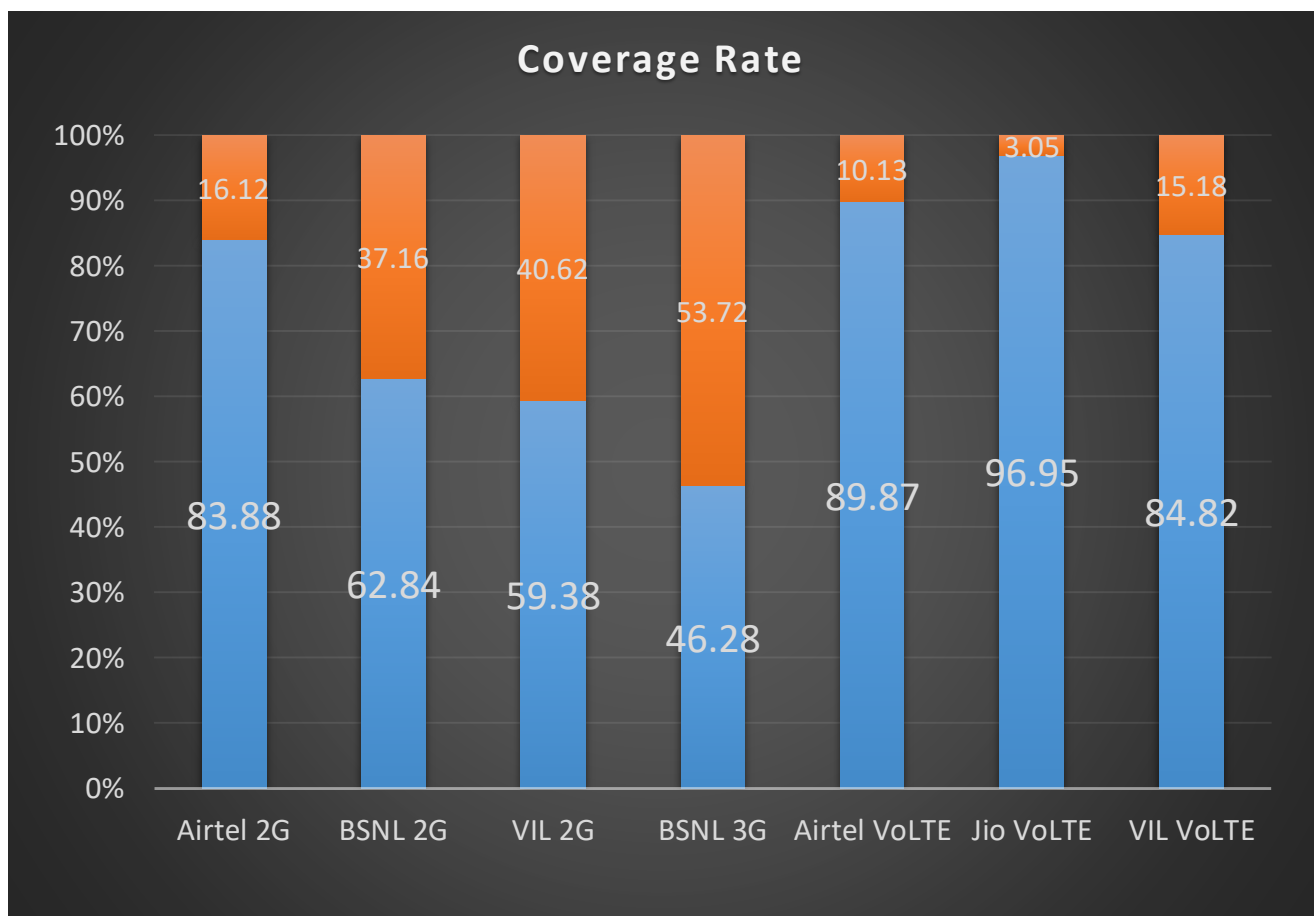
Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	232	242	235
Blocked Call Rate (%)	0%	0.83%	1.71%
CSSR% (Accessibility)	97.86%	99.17%	98.29%
Drop Call Rate (%)	0%	1.25%	1.29%
Mobility HOSR (%)	98.31%	95.45%	97.24%
Rx Quality (%)	90.91%	91.37%	94.9%
Average CST Sec	3.46	3.31	4.73

Voice Call	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	235	233	236	240
Blocked Call Rate (%)	0.86%	0%	0%	0.42%
CSSR% (Accessibility)	99.14%	99.05%	100%	99.58%
Drop Call Rate (%)	1.28%	0%	0%	0.42%
Mobility HOSR (%)	100%	99.93%	98.93%	95.71%
Rx Quality (%)	64.82%	92.62%	86.71%	94.64%
Average CST Sec	3.19	2.03	1.8	1.27

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	83.88%
BSNL 2G	62.84%
VIL 2G	59.38%
BSNL 3G	46.28%
Airtel VoLTE	89.87%
Jio VoLTE	96.95%
VIL VoLTE	84.82%

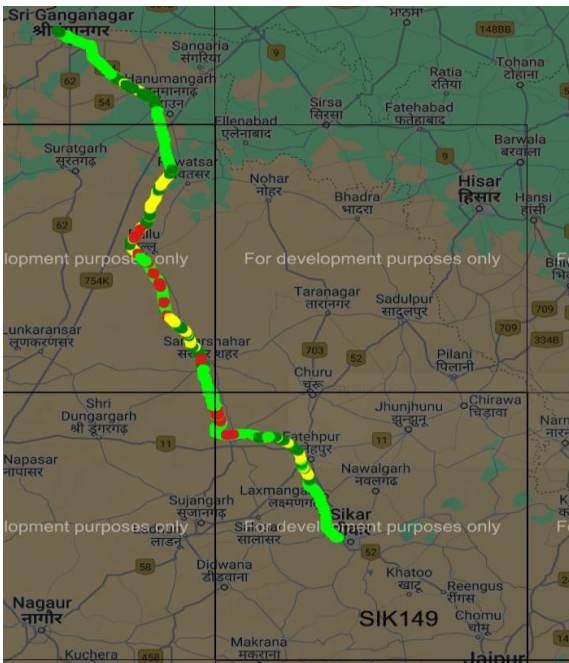


Coverage Details

TSP-AIRTEL

Technology	Coverage %
2G	83.88%
VoLTE	89.87%

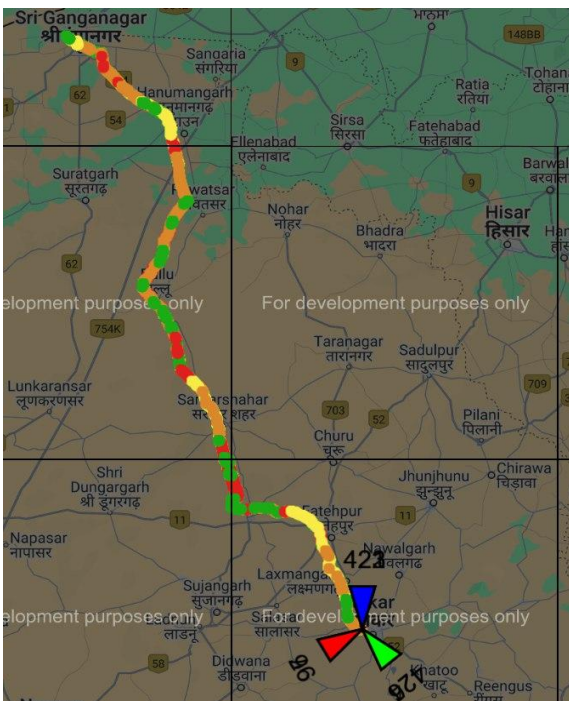
2G



Color	Range	Count	Per
Red	[Min to -95]	(851)	(7.79%)
Yellow	[-95 to -85]	(909)	(8.32%)
Green	[-85 to -75]	(5149)	(47.15%)
Dark Green	[-75, Max]	(4011)	(36.73%)

2G			
Overall RxLevel	# Samples	% PDF	Legend
[Max, >=-75]	4011	36.73%	Green
[-75, >=-85]	5149	47.15%	Yellow
[-85, >=-95]	909	8.33%	Orange
[-95, >=Min)	851	7.79%	Red
Total	10920	100%	

VoLTE

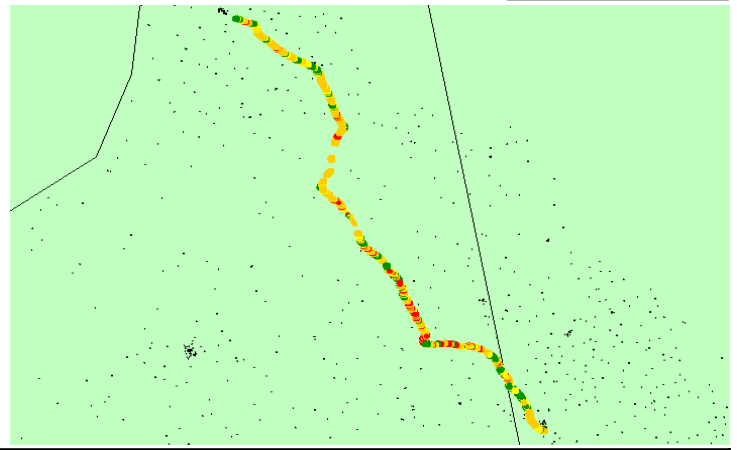
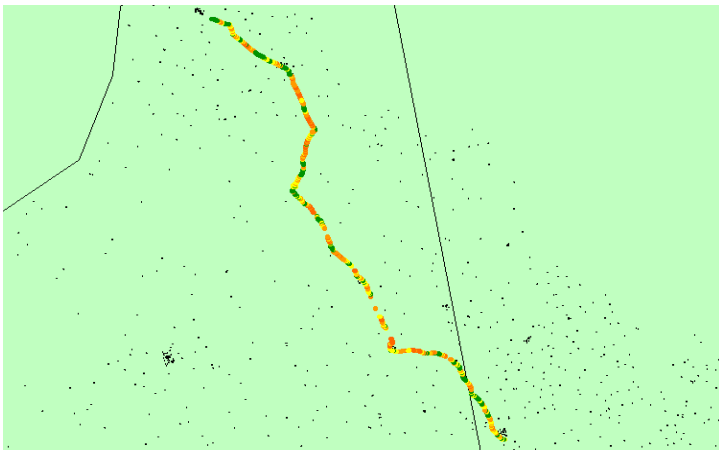


Color	Range	Count	Per
Red	[Min, -140]	(1124)	(10.14%)
Orange	[-110, -90]	(3065)	(27.64%)
Yellow	[-90, -80]	(3277)	(29.55%)
Green	[-80, Max]	(3622)	(32.67%)

VoLTE			
Overall RSRP	# Samples	% PDF	Legend
[Max, >=-80]	3622	32.67%	Green
[-80, >=-90]	3277	29.56%	Yellow
[-90, >=-110]	3065	27.64%	Orange
[-110, >=Min)	1124	10.13%	Red
Total	11088	100%	

TSP- BSNL

	Technology	Coverage %	
	2G	62.84%	
2G	3G	46.28%	3G



2G

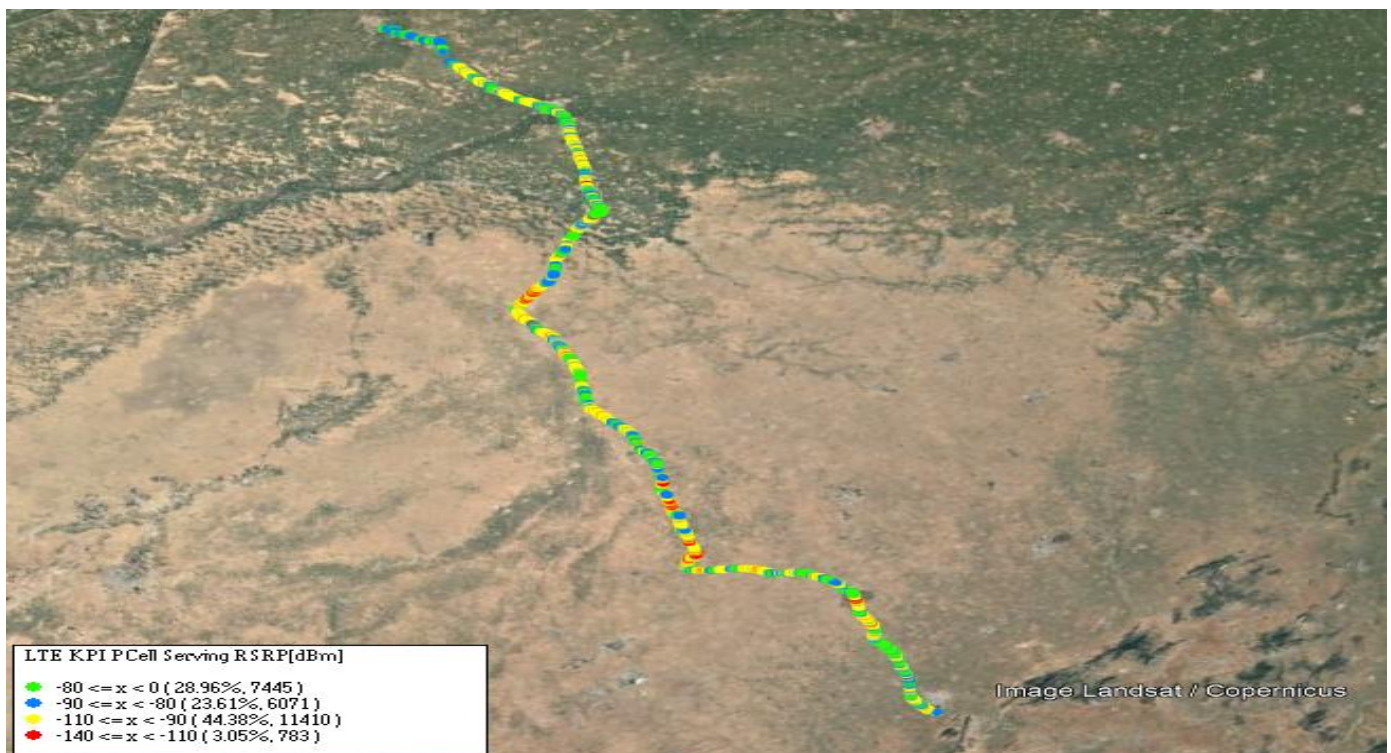
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	18510	37.41%	
[-75, >=-85)	12584	25.43%	
[-85, >=-95)	13343	26.97%	
[-95, >=Min)	5044	10.19%	
Total	49481	100%	

3G

Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	9040	25.26%	
[-70, >=-80)	7531	21.03%	
[-80, >=-90)	16159	45.13%	
[-90, >=Min)	3073	8.58%	
Total	35803	100	

JIO

Technology	Coverage %
VoLTE	96.95%

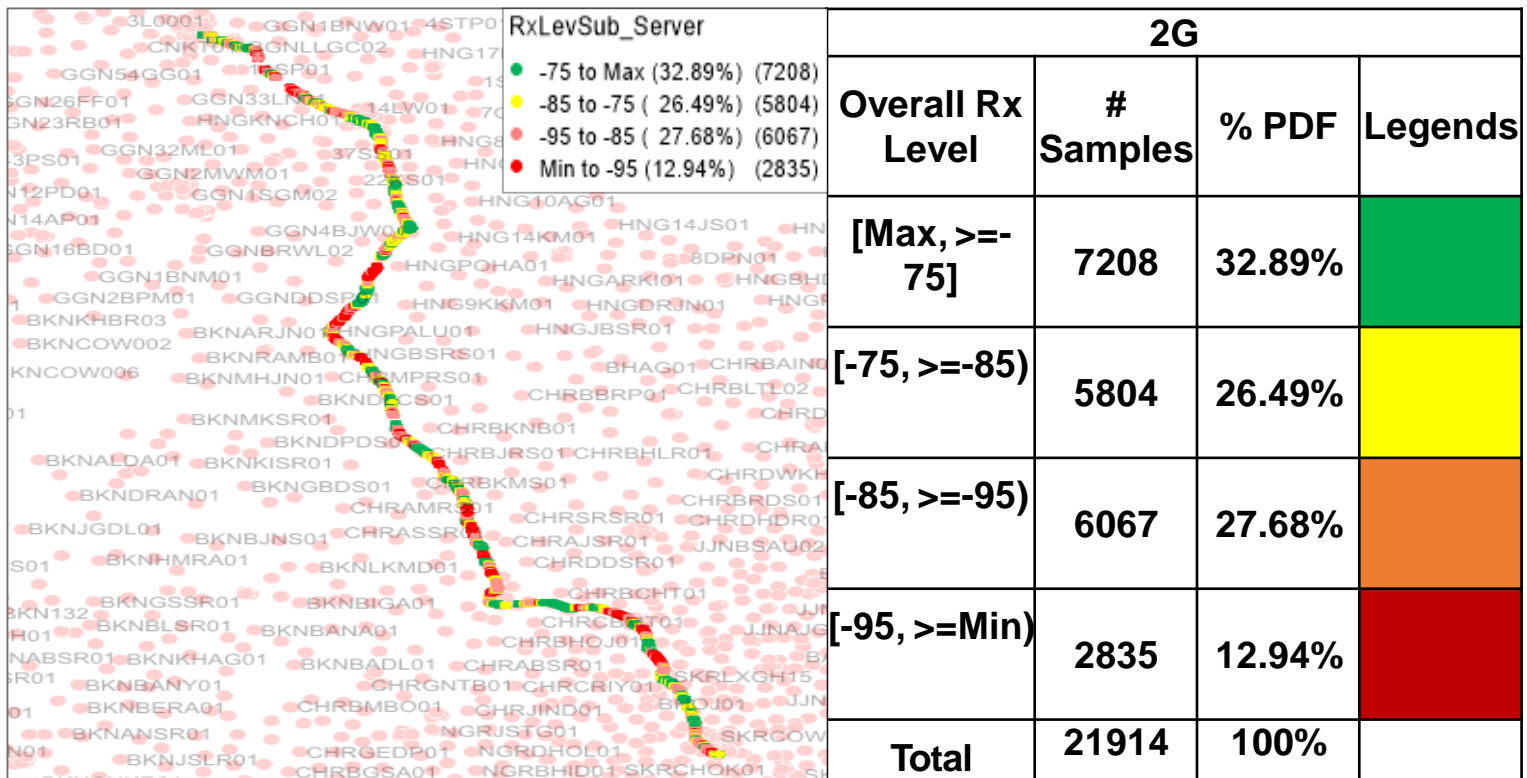


VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	7445	28.96%	
[-80, >=-90)	6071	23.61%	
[-90, >=-110)	11410	44.38%	
[-110, >=Min)	783	3.05%	
Total	25709	100%	

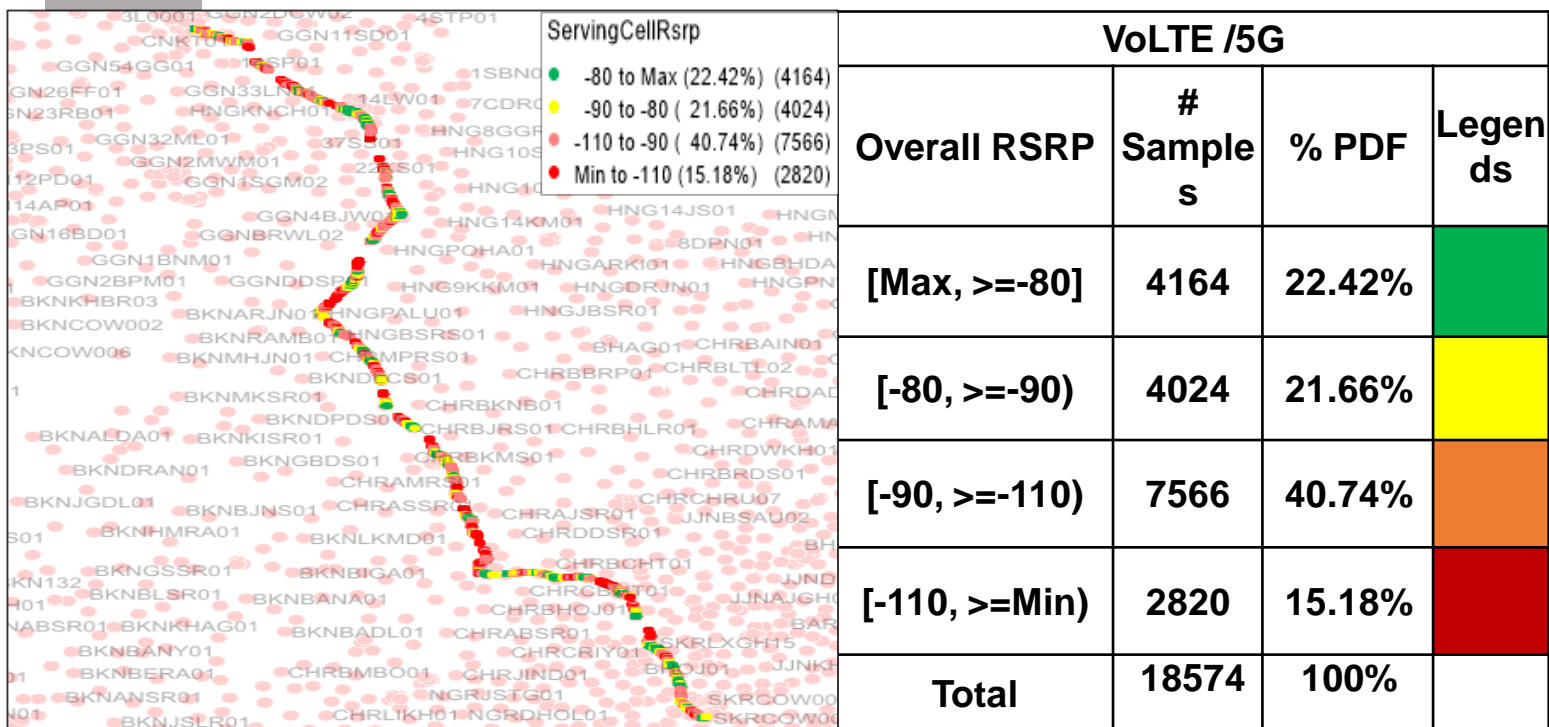
VIL

2G

Technology	Coverage Rate %
2G	59.38%
VoLTE	84.82%



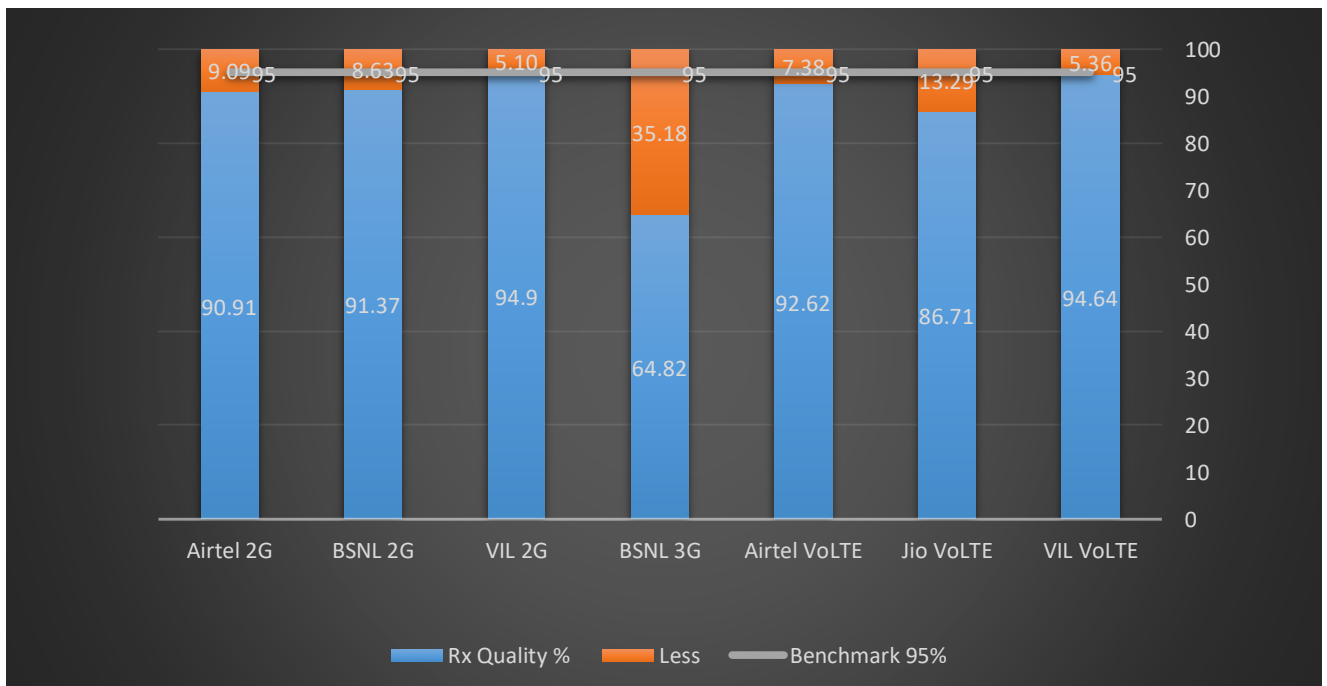
VoLTE



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	90.91%
BSNL 2G	91.37%
VIL 2G	94.9%
BSNL 3G	64.82%
Airtel VoLTE	92.62%
Jio VoLTE	86.71%
VIL VoLTE	94.64%

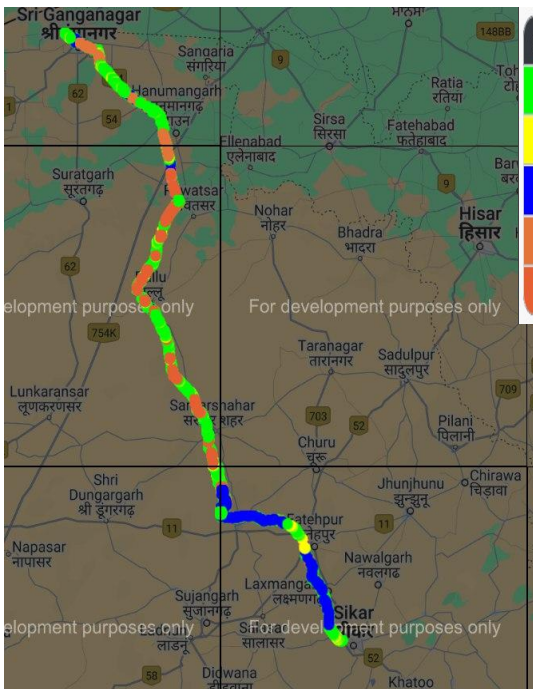


II. Quality Details

Airtel

2G

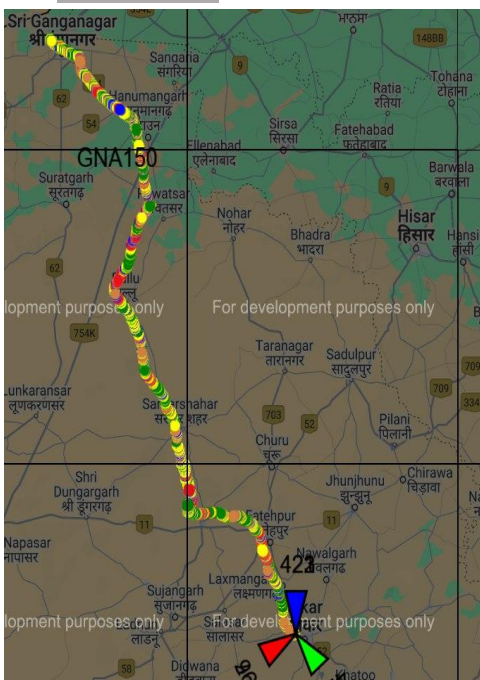
Technology	Rx Quality %
2G	90.91%
VoLTE	92.62%



Color	Range	Count	Per
Green	[Min, 2)	(6771)	(74.31%)
Yellow	[2, 3)	(584)	(6.41%)
Blue	[3, 4)	(603)	(6.62%)
Orange	[4, 5)	(325)	(3.57%)
Red	[5, Max)	(829)	(9.1%)

Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	6771	74.31%	Green
(2, <=3)	584	6.41%	Yellow
(3, <=4)	603	6.62%	Blue
(4, <=5)	325	3.57%	Orange
(5, <=Max)	829	9.09%	Red
Total	9112	100%	

VoLTE



Color	Range	Count	Per
Red	(Min, 0)	(931)	(8.38%)
Orange	(0, 5)	(1937)	(17.43%)
Blue	(5, 10)	(1329)	(11.96%)
Yellow	(10, 15)	(4013)	(36.11%)
Green	(15, Max)	(2903)	(26.12%)

Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	931	8.38	Red
(0, <=5)	1937	17.43	Orange
(5, <=10)	1329	11.96	Blue
(10, <=15)	4013	36.11	Yellow
(15, <=Max)	2903	26.12	Green
Total	11113	100.00	

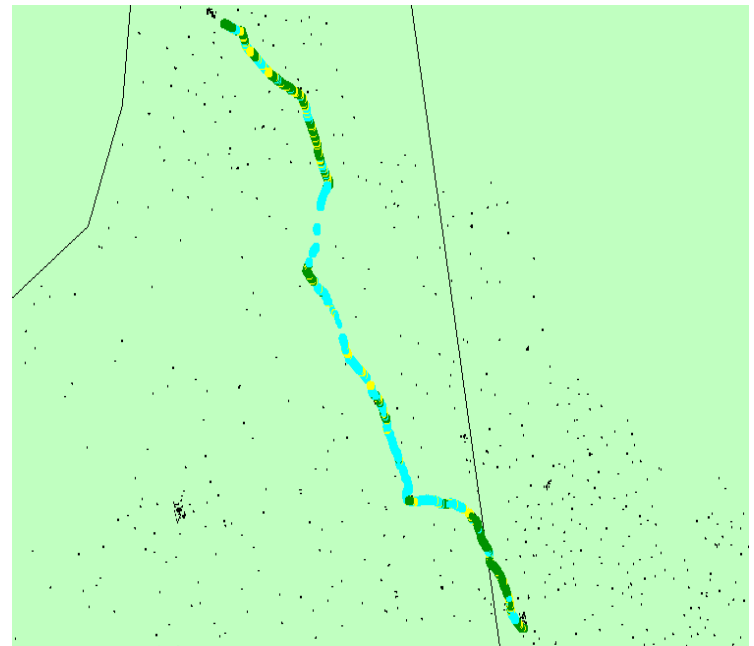
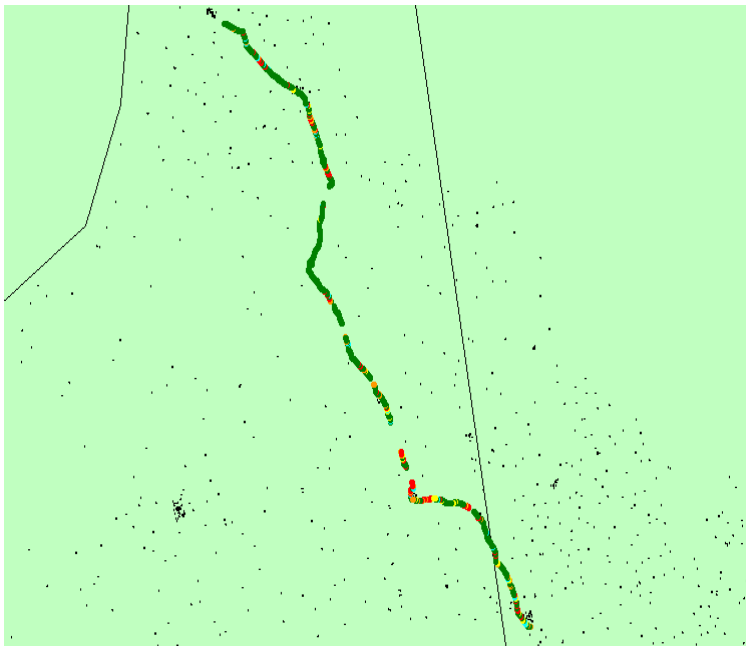
II. Quality Details

BSNL

Technology	Rx Quality %
2G	91.37%
3G	64.82%

2G

3G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	34597	79.19%	
(2, <=3)	1647	3.77%	
(3, <=4)	1723	3.94%	
(4, <=5)	1952	4.47%	
(5, <=Max)	3771	8.63%	
Total	43690	100%	

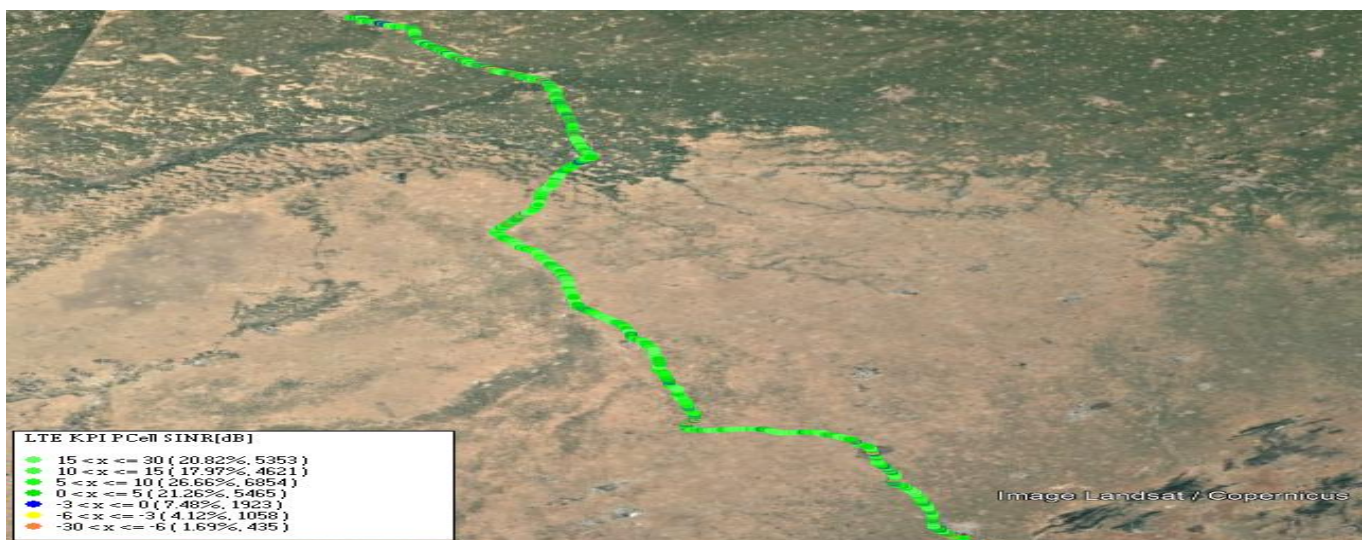
Overall Ec/N0	# Samples	% PDF	Legends
[Max, >=-12]	17240	48.38%	
[-12, >=-14)	5857	16.44%	
[-14, >=Min)	12538	35.18%	
Total	35635	100	

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	86.71%



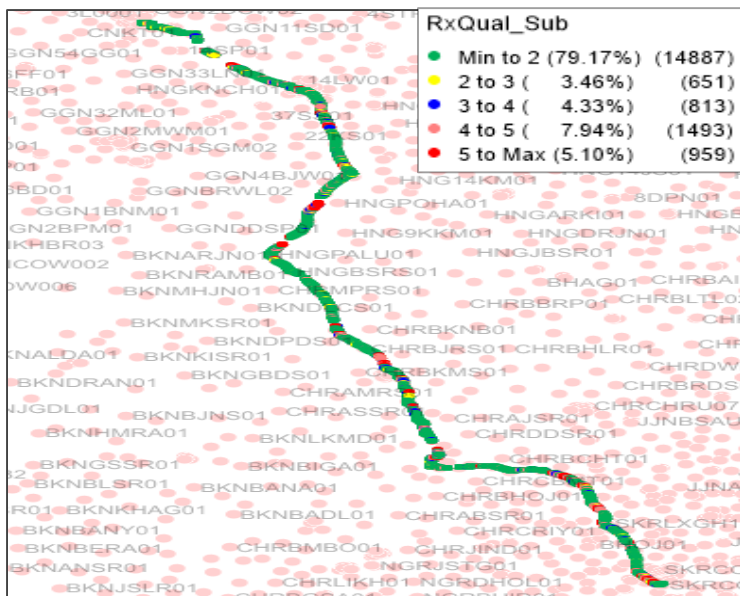
Overall SINR	# Samples	% PDF	Legends
(Min, ≤ -6)	435	1.69	
(-6, ≤ -3)	1058	4.12	
(-3, ≤ 0)	1923	7.48	
(0, ≤ 5)	5465	21.26	
(5, ≤ 10)	6854	26.66	
(10, ≤ 15)	4621	17.97	
(15, $\leq \text{Max}$)	5353	20.82	
Total	25709	100%	

II. Quality Details

VIL

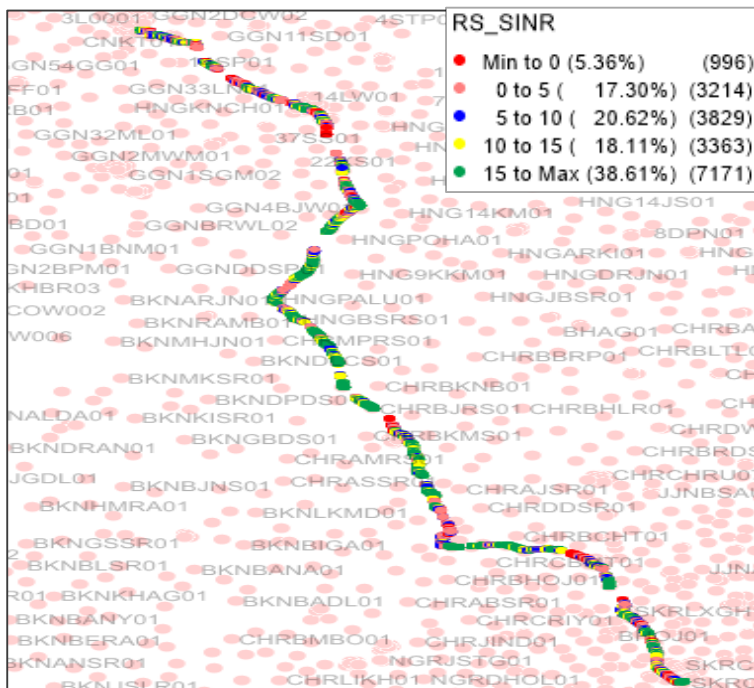
Technology	Rx Quality %
2G	94.90%
4G	94.64%

2G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	14887	79.17%	
(2, <=3)	651	3.46%	
(3, <=4)	813	4.33%	
(4, <=5)	1493	7.94%	
(5, <=Max)	949	5.10%	
Total	18803	100%	

VolTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	996	5.36%	
(0, <=5)	3214	17.30%	
(5, <=10)	3829	20.62%	
(10, <=15)	3363	18.11%	
(15, <=Max)	7171	38.61%	
Total	18573	100%	

III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	38.94%
Airtel VoLTE	100%
Jio VoLTE	100%
VIL VoLTE	99.29%

