



Operator Assisted Drive Test Report

Bhavnagar to Rajula Highway

25th May 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 on Bhavnagar Rajula Highway , from 9:00 AM to 6:00 PM on 25th May 2023. The drive test covered drive route of 130 KMs over a period of 1 day. Approximately 150 calls were made for each of the networks: three 2G networks and four 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 25th May 2023 covering Bhavnagar Rajula Highway. The performance of Airtel, BSNL, Vodafone Idea and Jio was monitored across various technologies (2G 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 130 KMs. Approximately 150 calls were made for each of the networks: three 2G (Lock Mode) networks and Four VoLTE networks covering 4 unique TSPs.

Data Tests:

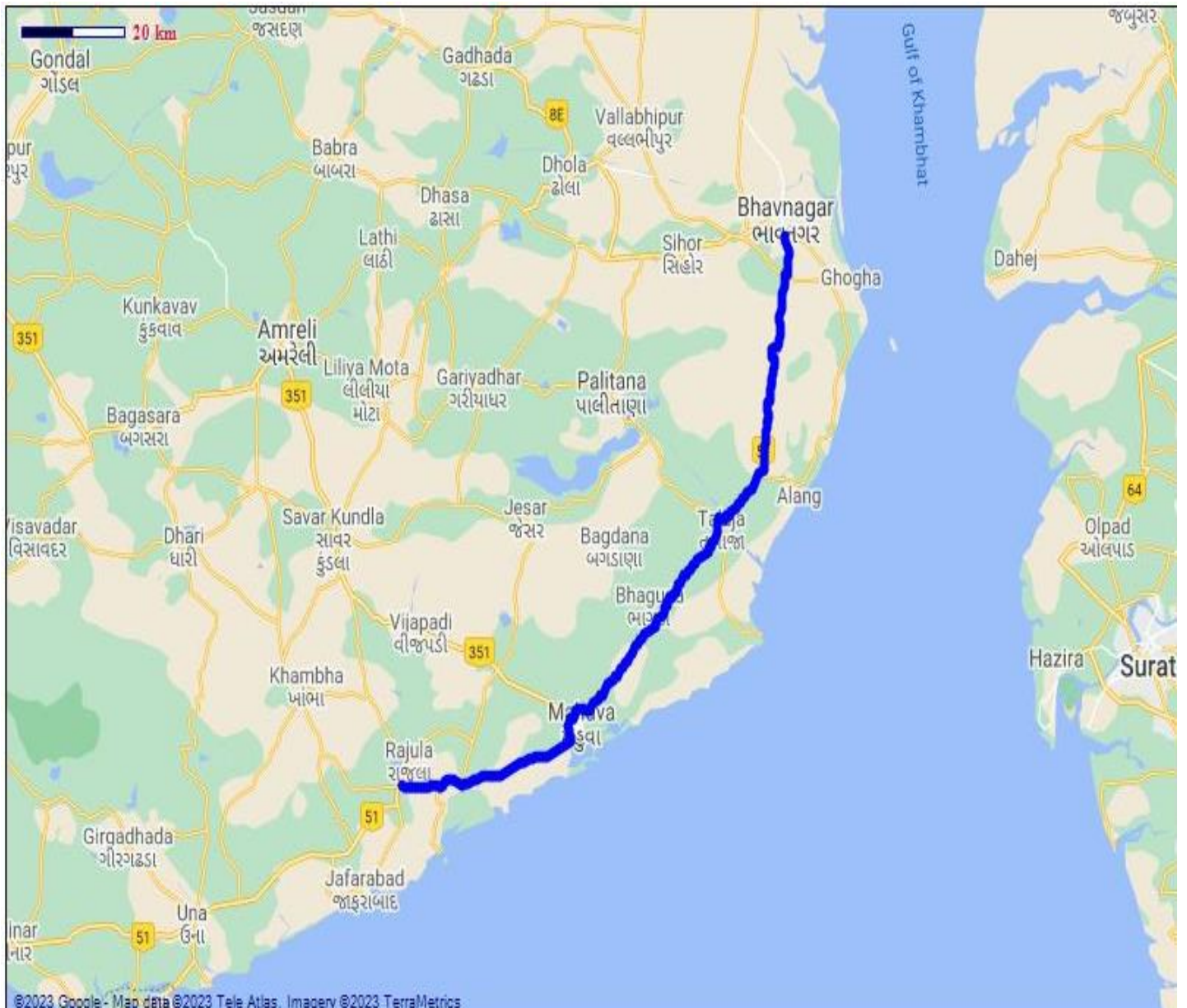
Dynamic data test was conducted for 130 Kms for download throughput in all technologies.

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

Voice & Dynamic Data Test Drive Route

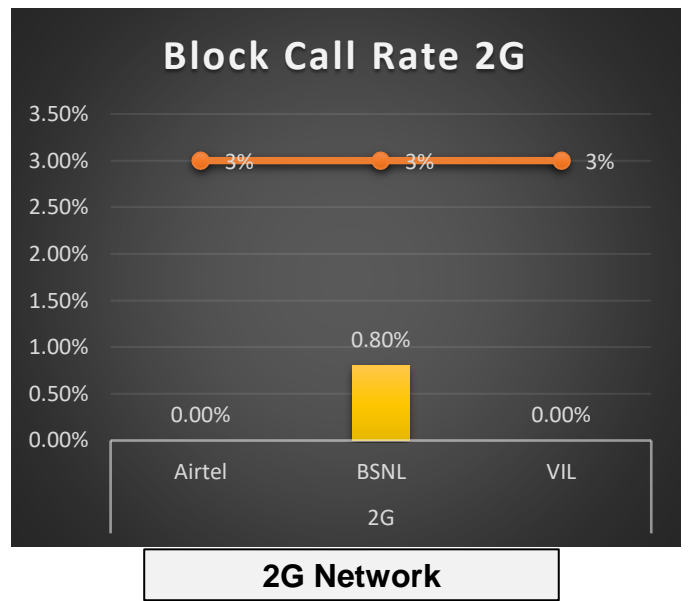
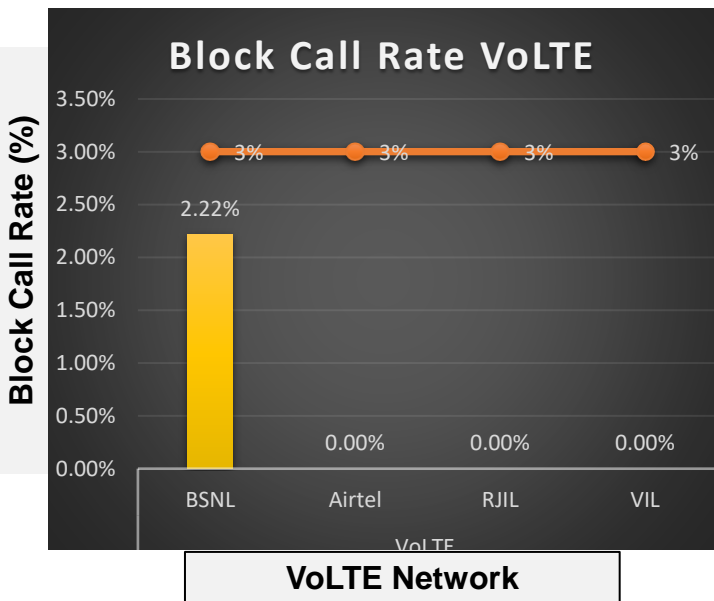
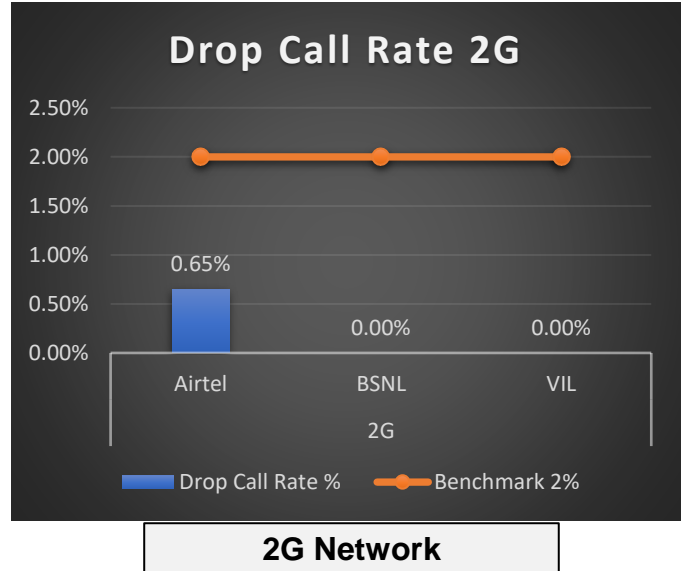
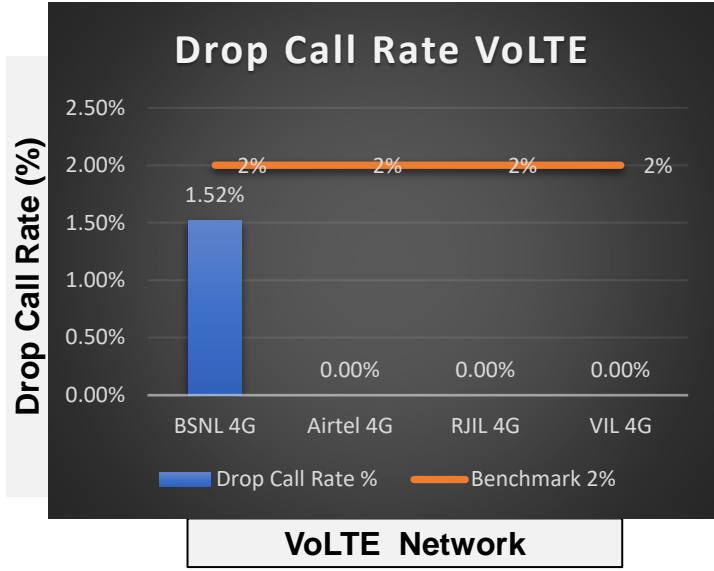


Date	Test Scenario	Area to be Covered
25-05-2023	2G/3G/4G Voice and 3G/4G/5G Dynamic Data	Starting Point : Top 3 Circle, Bhavnagar at 9:00AM : Bhavnagar to Rajula (NH-51)

Voice Calls

Key Observations

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



KPIs	2G			4G			
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0.65%	0.00%	0.00%	1.52%	0.00%	0.00%	0.00%
Block Call Rate %	0.00%	0.80%	0.00%	2.22%	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 %	88.71%	80.45%	96.85%

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

TSPs	VoLTE			
	Airtel	BSNL	JIO	VIL
Coverage %	98.13%	98.61%	98.72%	97.26%

c) Percentage of time spent on 4G network

TSPs	VoLTE			
	BSNL	Airtel	JIO	VIL
Time spent on 4G Network %	20.37%	100.00%	100.00%	100.00%

Data Services Dynamic

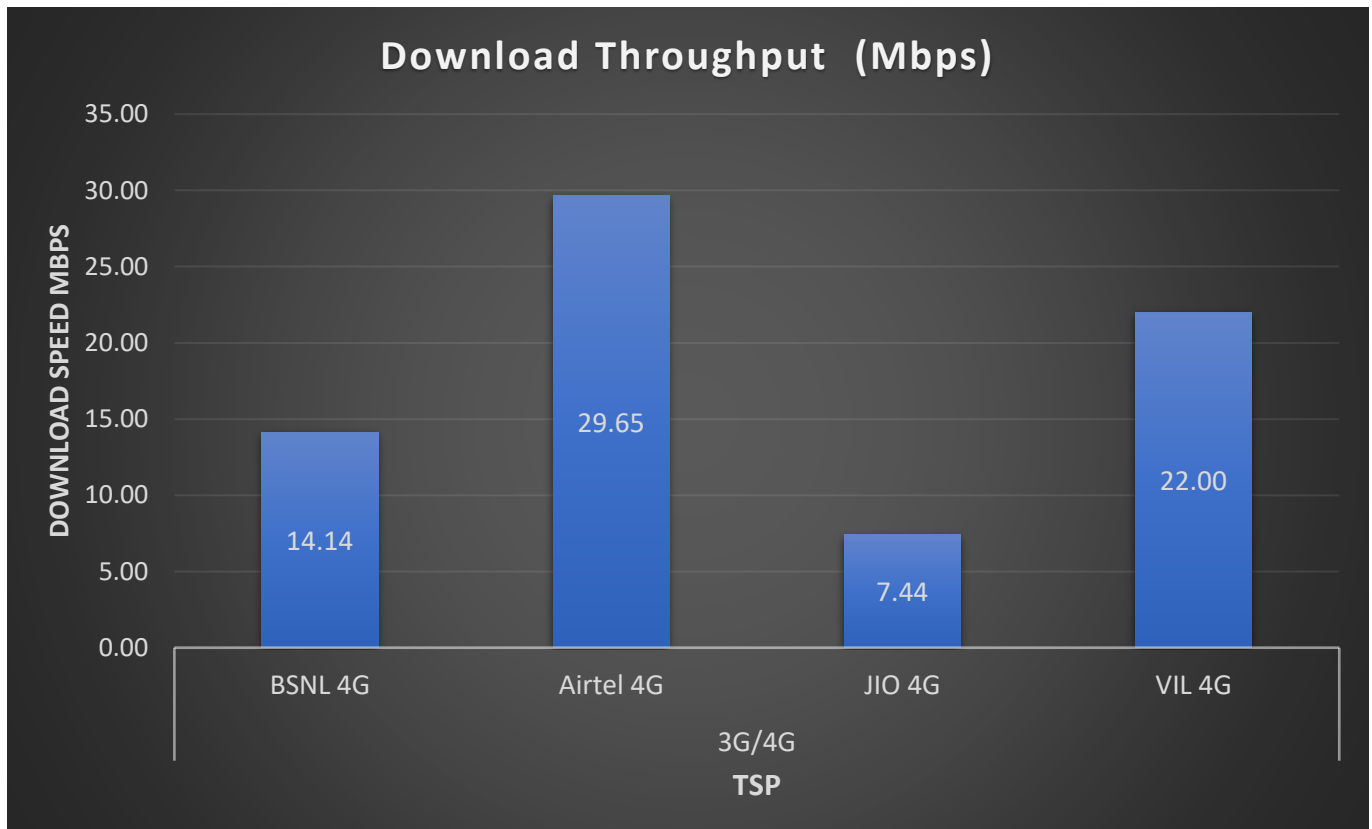
Key Observations

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 4G	Airtel 4G	JIO 4G	VIL 4G
Download Throughput (Mbps)	14.14	29.65	7.44	22.00



Summary

City Level Summary-Voice

Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	153	125	162
Blocked Call Rate (%)	0.00%	0.80%	0.00%
CSSR% (Accessibility)	100.00%	99.20%	100.00%
Drop Call Rate (%)	0.65%	0.00%	0.00%
Mobility HOSR (%)	97.80%	95.96%	98.60%
Rx Quality (%)	93.38%	98.16%	97.38%
Average CST Sec	3.57	2.44	2.52

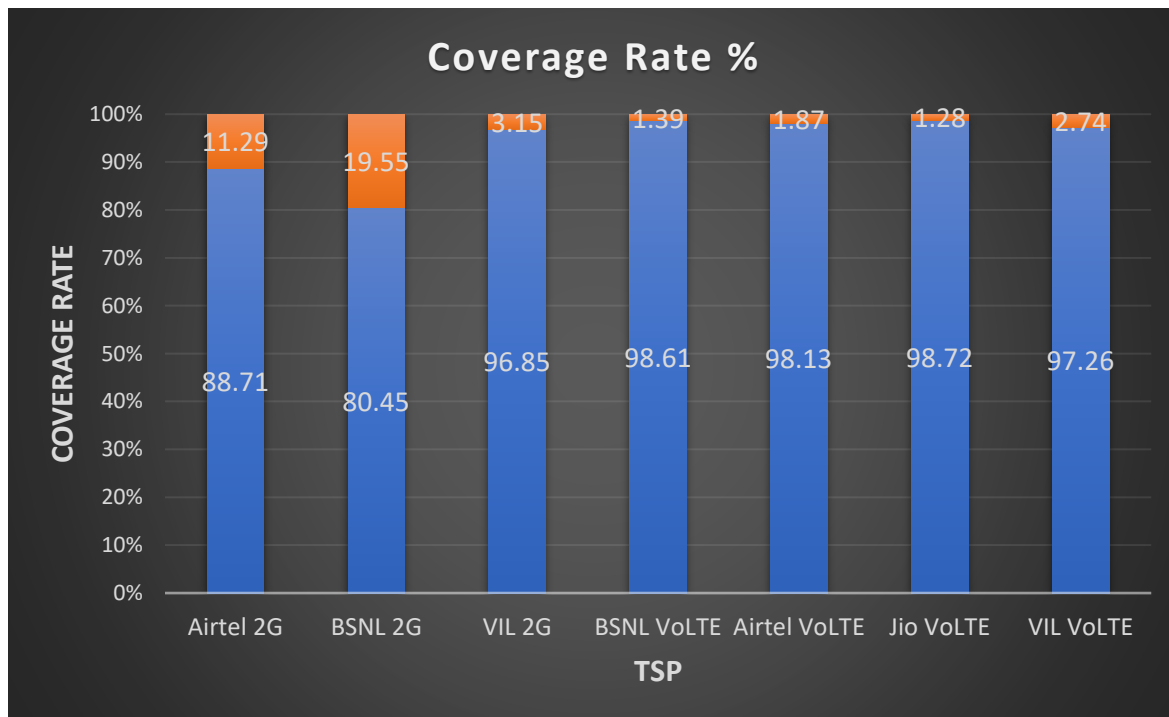
Voice Call	VoLTE			
	BSNL VoLTE	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	135	163	138	144
Blocked Call Rate (%)	2.22%	0.00%	0.00%	0.00%
CSSR% (Accessibility)	97.78%	100.00%	100.00%	100.00%
Drop Call Rate (%)	1.52%	0.00%	0.00%	0.00%
Mobility HOSR (%)	98.54%	99.14%	98.66%	99.70%
Rx Quality (%)	97.66%	68.75%	91.49%	83.38%
Average CST Sec	2.89	1.14	0.58	0.34

- a) All TSPs have to met the 95% QOS benchmark of Rx Quality .
 b) Drop Call Rate (DCR%) Benchmark is 2% and Call Block Rate (CBR%) benchmark is 3%

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.

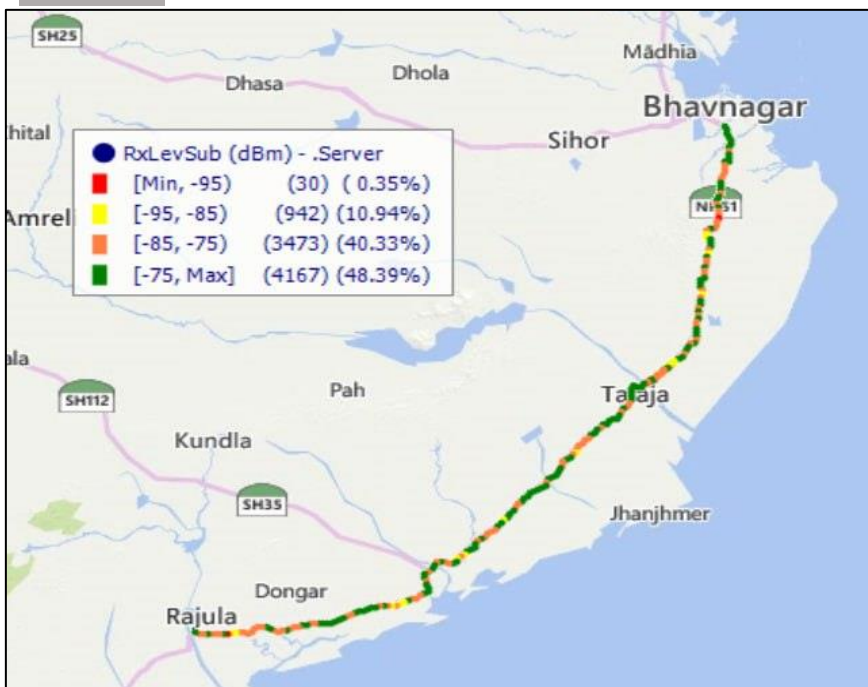
TSP	Coverage Rate %
Airtel 2G	88.71%
BSNL 2G	80.45%
VIL 2G	96.85%
BSNL VoLTE	98.61%
Airtel VoLTE	98.13%
Jio VoLTE	98.72%
VIL VoLTE	97.26%



TSP-AIRTEL

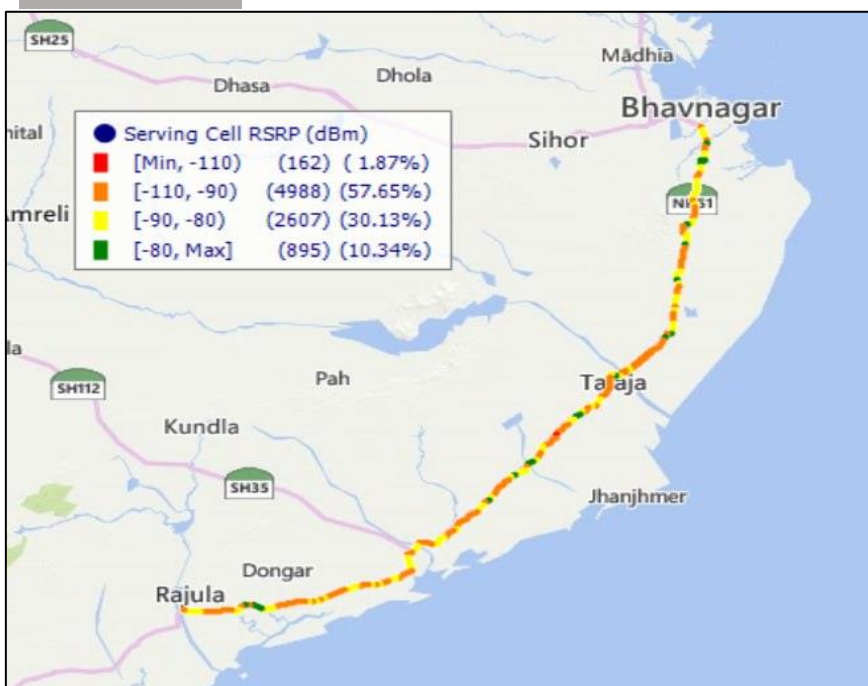
TSP	Coverage Rate %
Airtel 2G	88.71%
Airtel VoLTE	98.13%

2G



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	4167	48.39	Green
[-75, >=-85)	3473	40.33	Yellow
[-85, >=-95)	942	10.94	Orange
[-95, >=Min)	30	0.35	Red
Total	8612	100%	

VoLTE

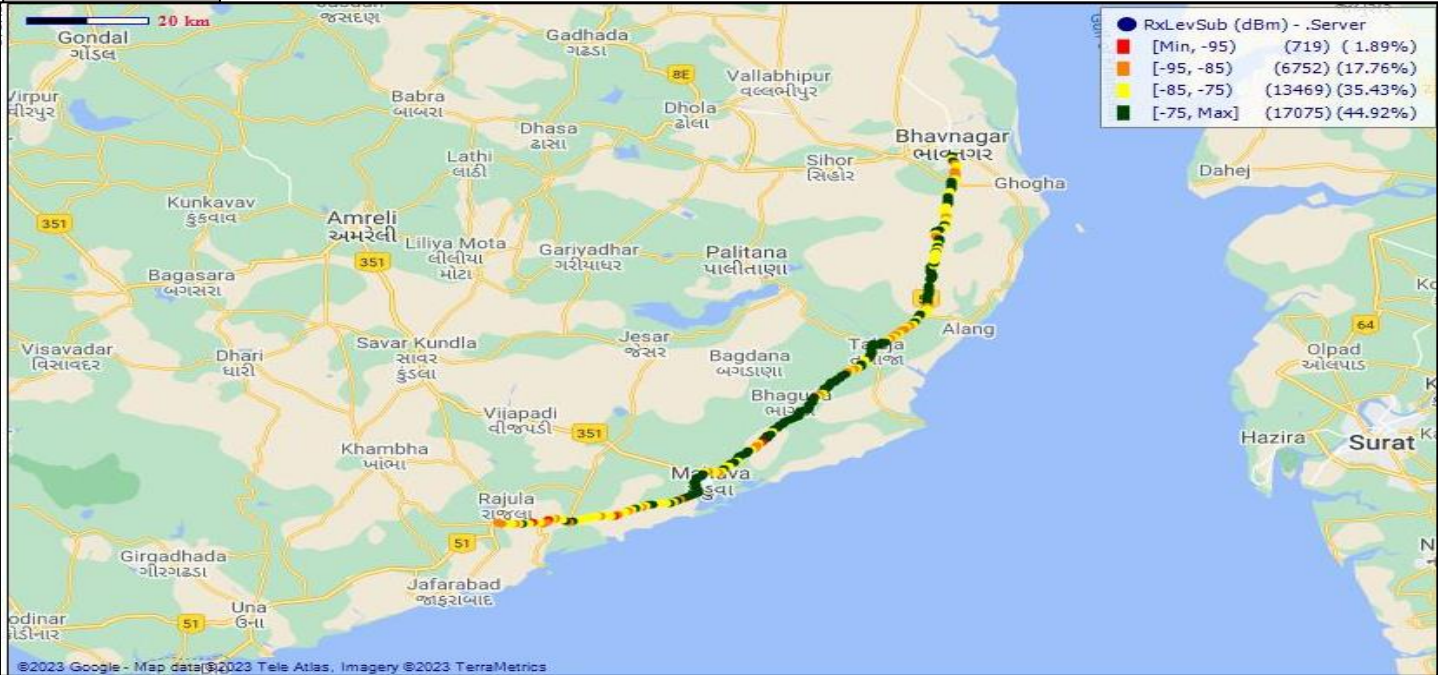


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	895	10.34	Green
[-80, >=-90)	2607	30.13	Yellow
[-90, >=-110)	4988	57.65	Orange
[-110, >=Min)	162	1.87	Red
Total	8652	100	

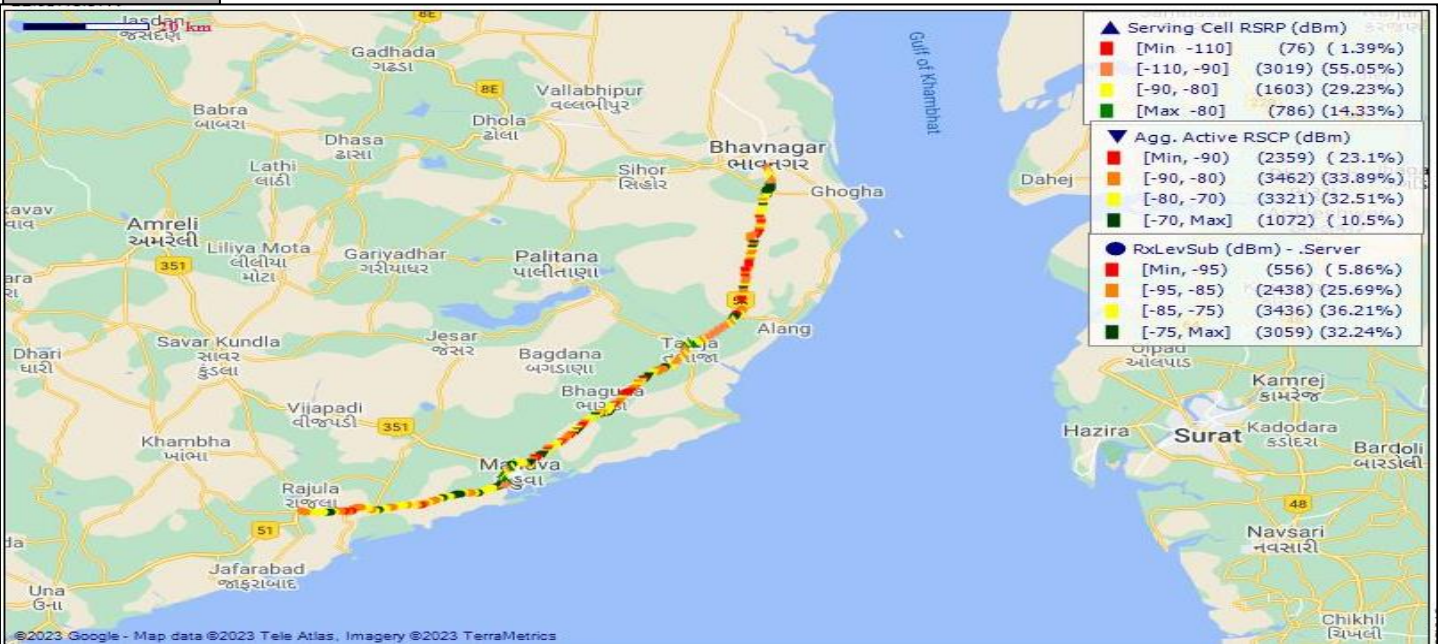
TSP- BSNL

Technology	Coverage %
2G	80.45%
3G	98.61%

2G

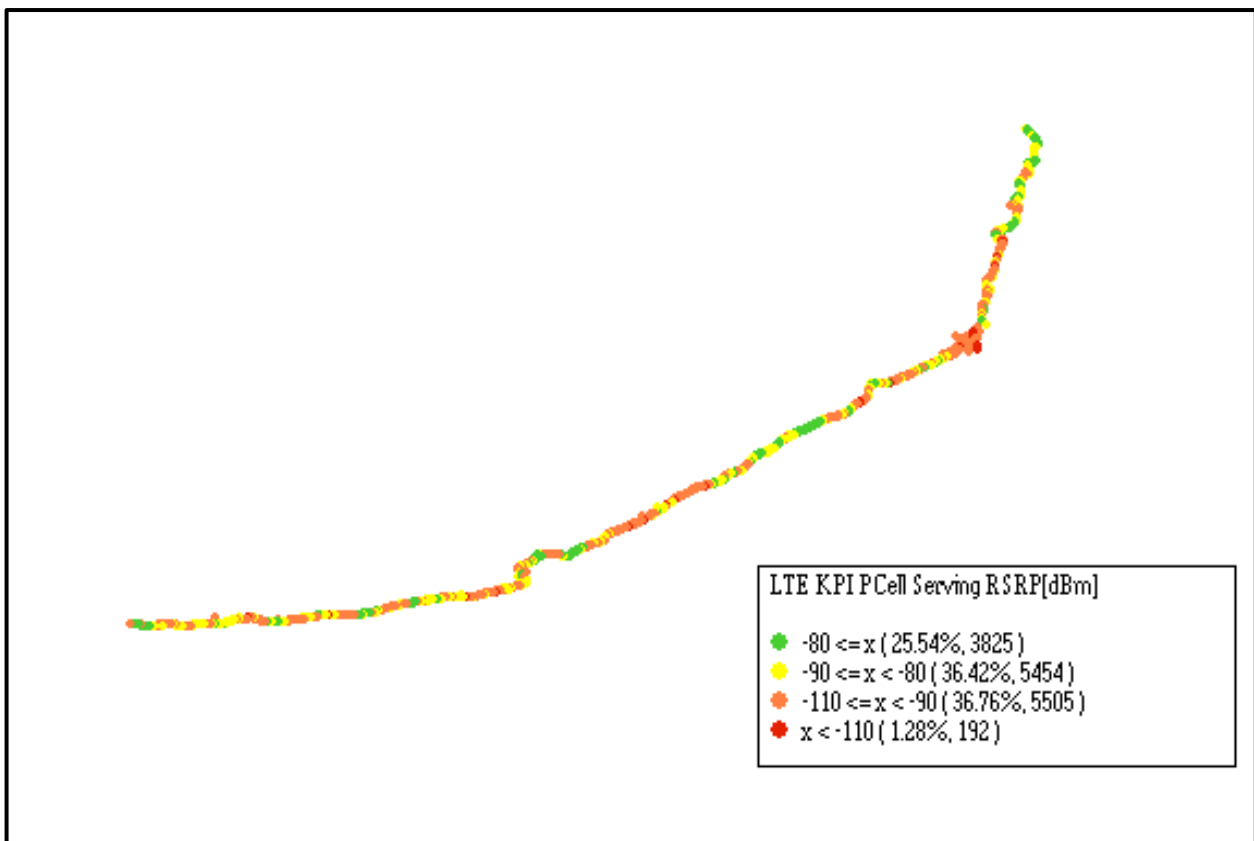


VoLTE



JIO

Technology	Coverage %
VoLTE	98.72%

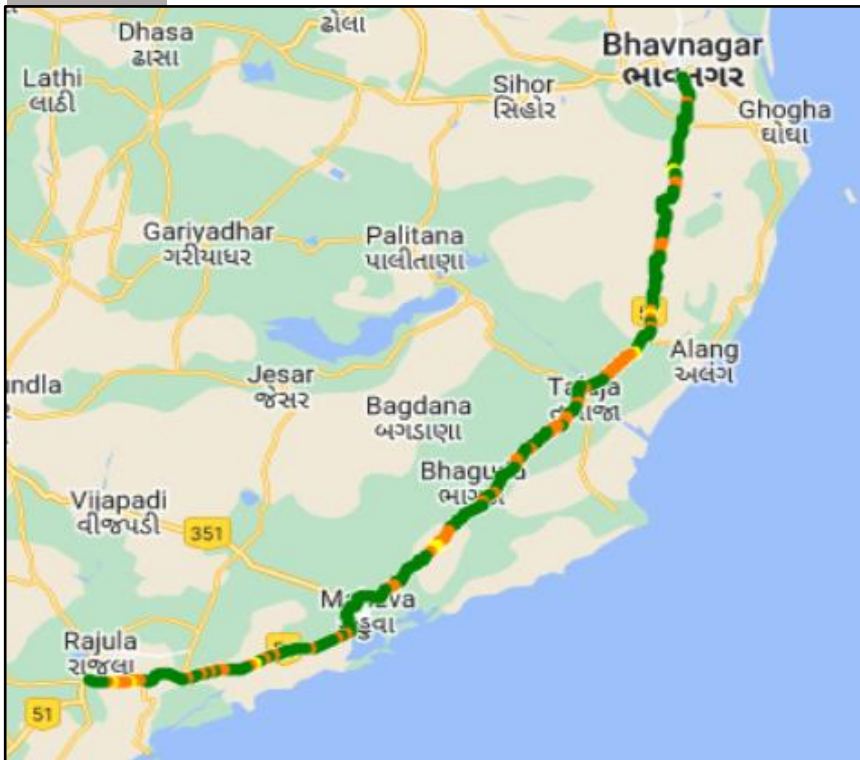


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	3825	25.54%	
[-80, >=-90)	5454	36.42%	
[-90, >=-110)	5505	36.76%	
[-110, >=Min)	192	1.28%	
Total	14976	100%	

VIL

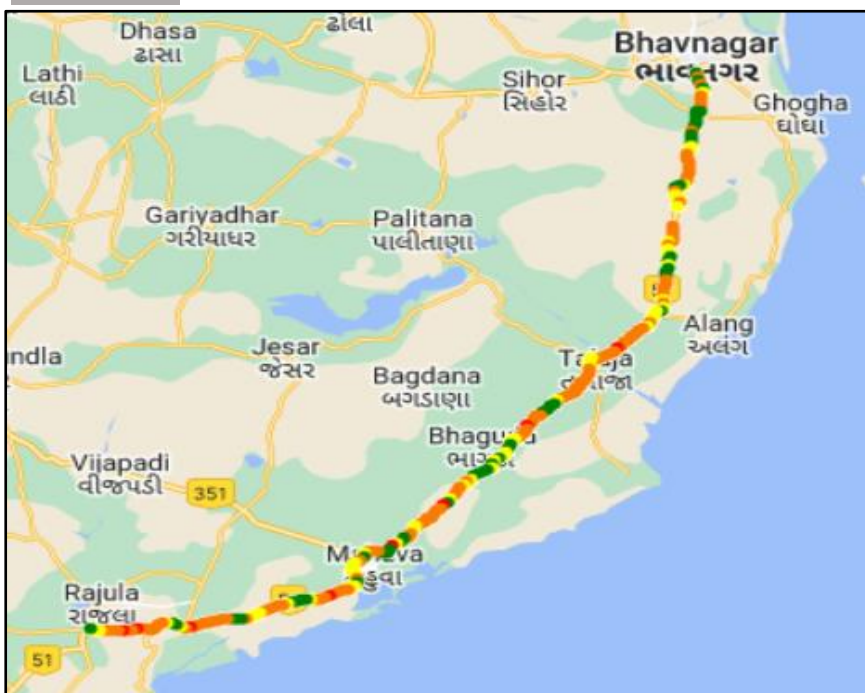
Technology	Coverage Rate %
2G	96.85%
VoLTE	97.26%

2G



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	6165	76.02	Green
[-75, >=-85)	1689	20.83	Yellow
[-85, >=-95)	250	3.08	Orange
[-95, >=Min)	6	0.07	Red
Total	8110	100%	

VoLTE

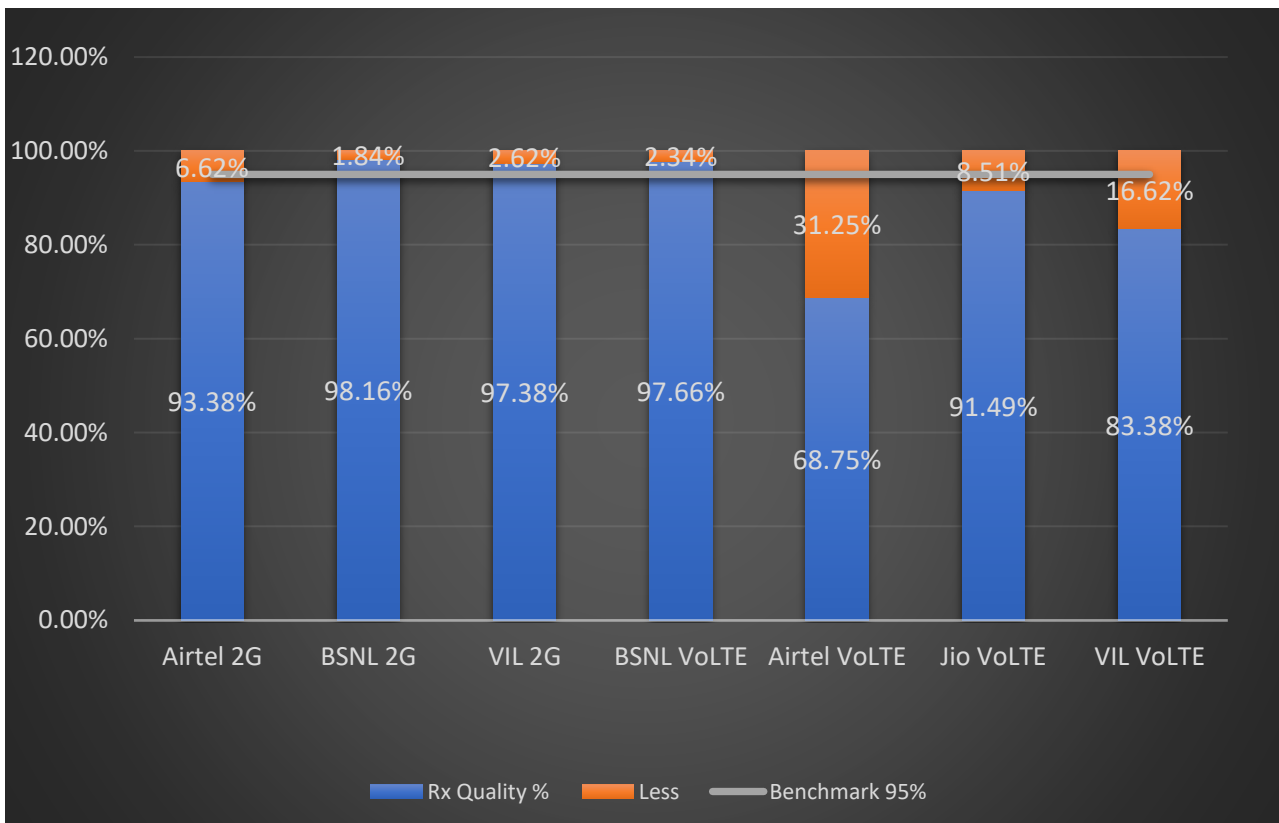


VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	2618	33.5	Green
[-80, >=-90)	1832	23.44	Yellow
[-90, >=-110)	3152	40.33	Orange
[-110, >=Min)	214	2.74	Red
Total	7816	100%	

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.

TSP	Rx Quality %
Airtel 2G	93.38%
BSNL 2G	98.16%
VIL 2G	97.38%
BSNL VoLTE	97.66%
Airtel VoLTE	68.75%
Jio VoLTE	91.49%
VIL VoLTE	83.38%



II. Quality Details

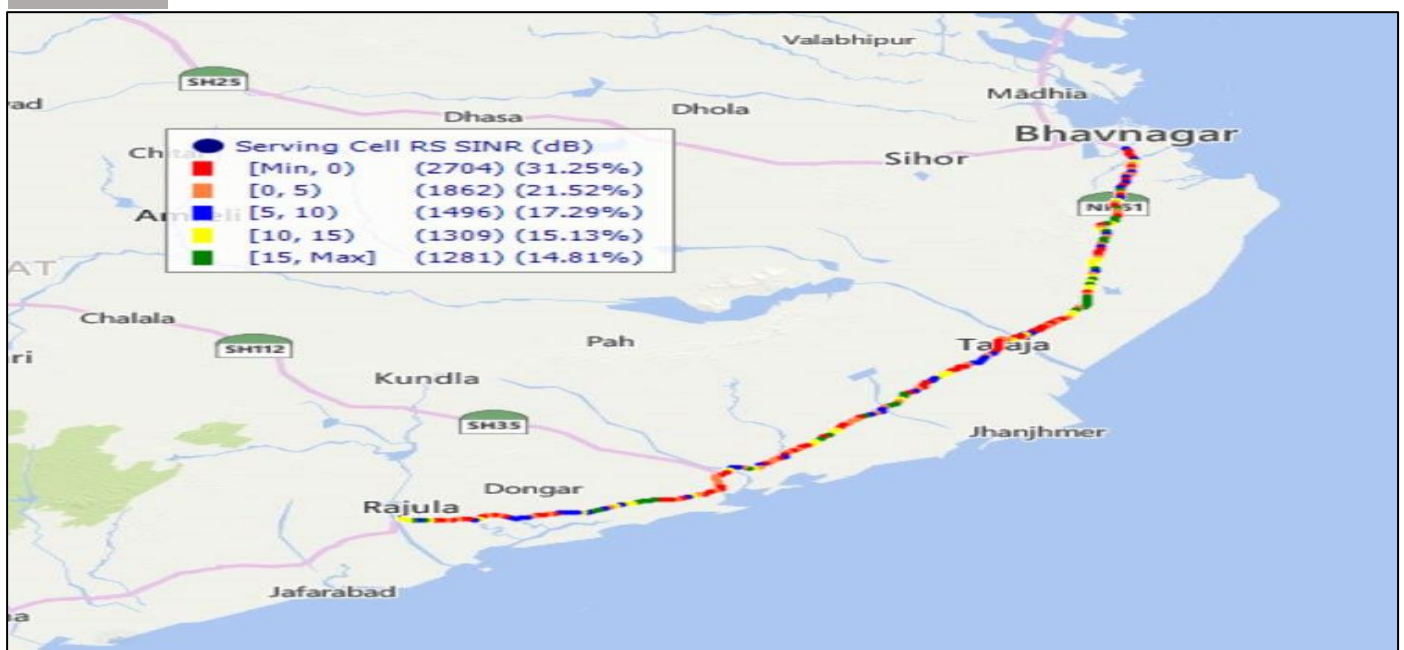
Airtel

Technology	Rx Quality %
2G	93.38%
VoLTE	68.75%

2G



VoLTE

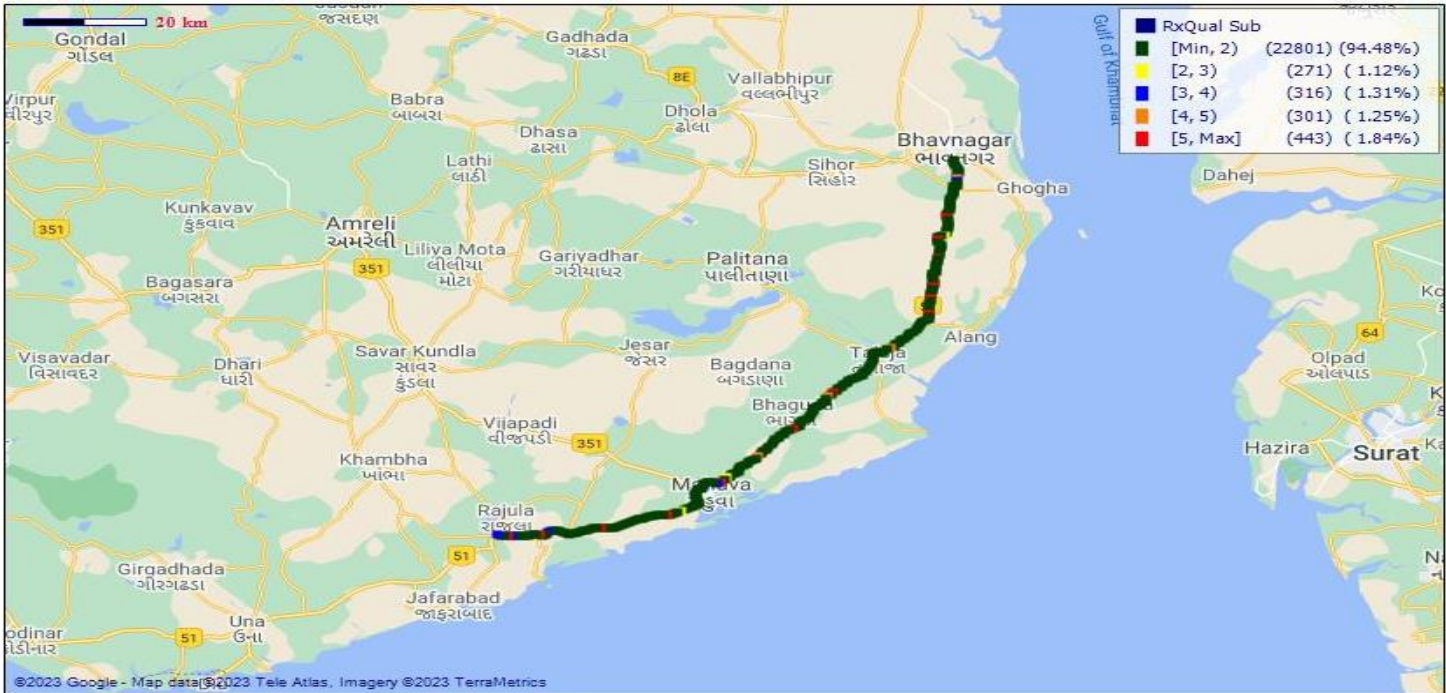


II. Quality Details

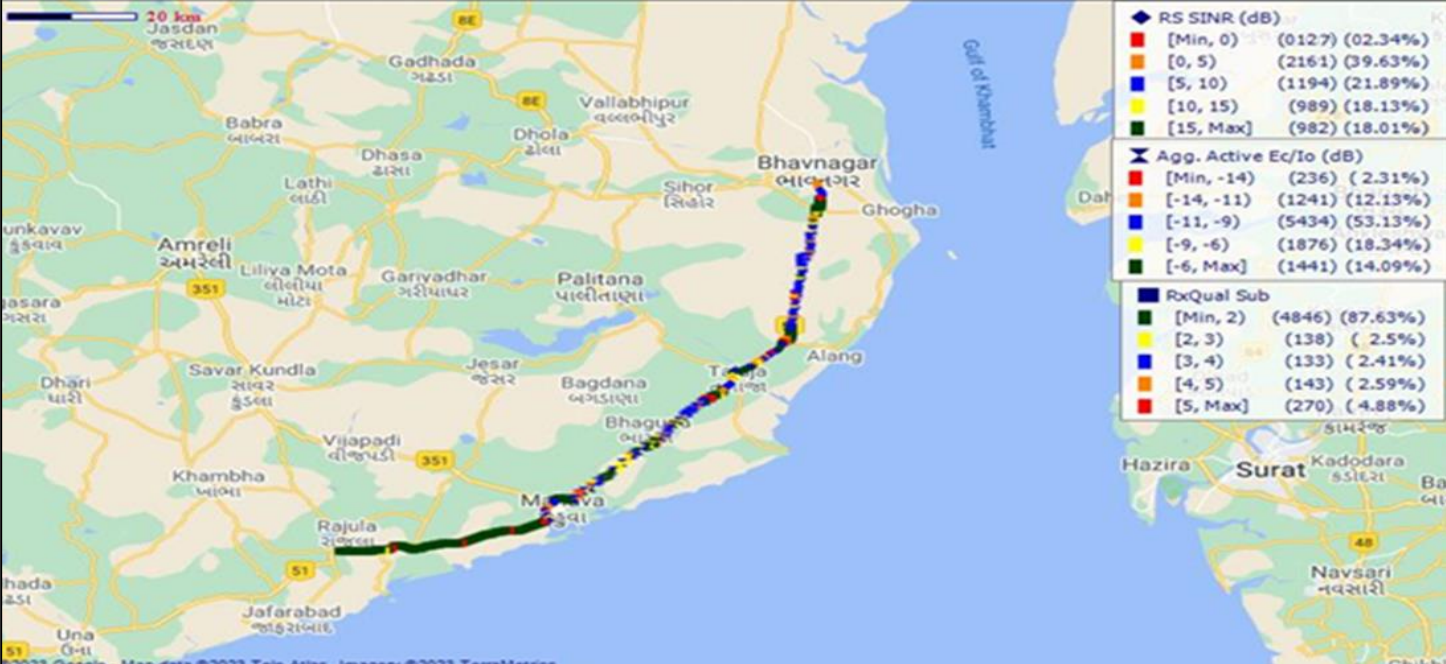
BSNL

Technology	Rx Quality %
2G	98.16%
VoLTE	97.66%

2G



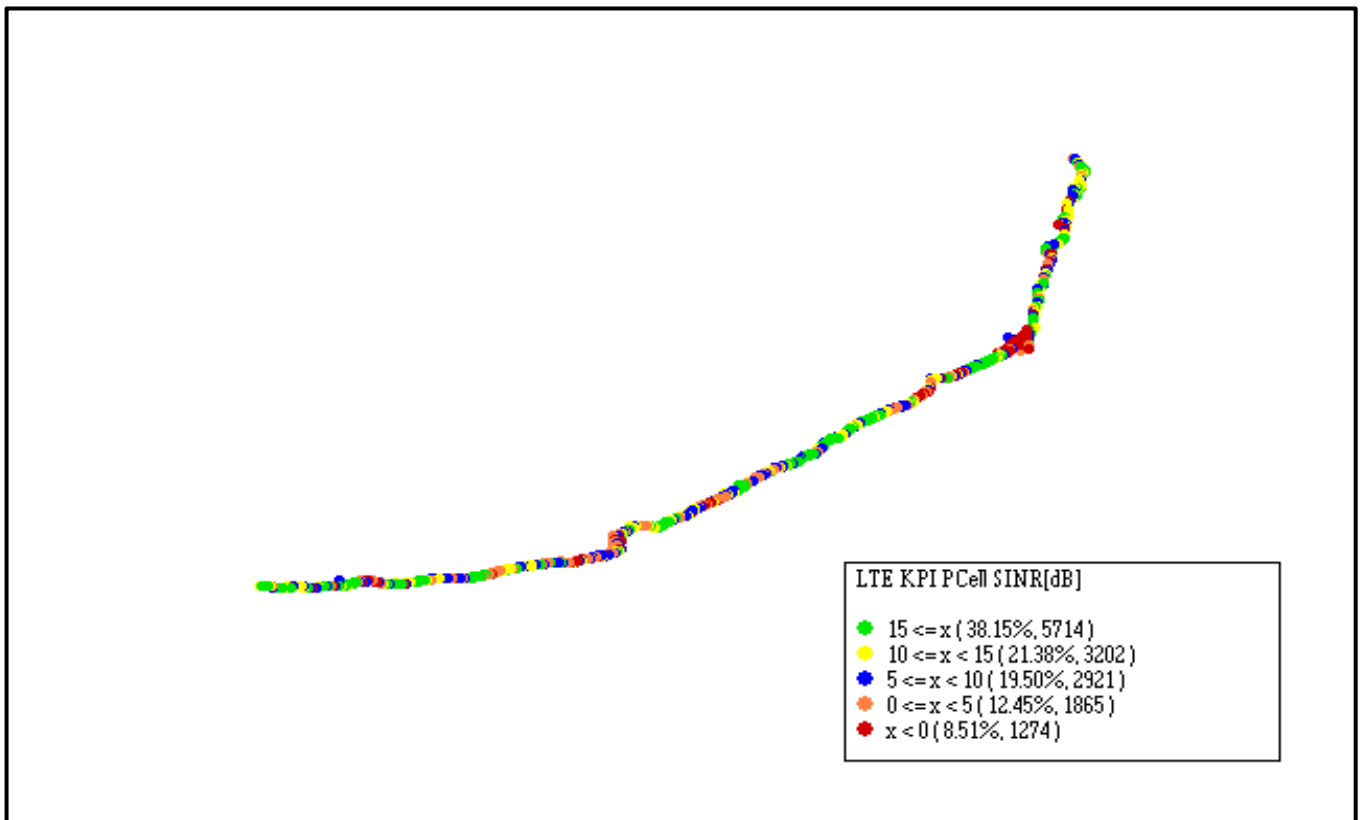
VoLTE



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	91.49%



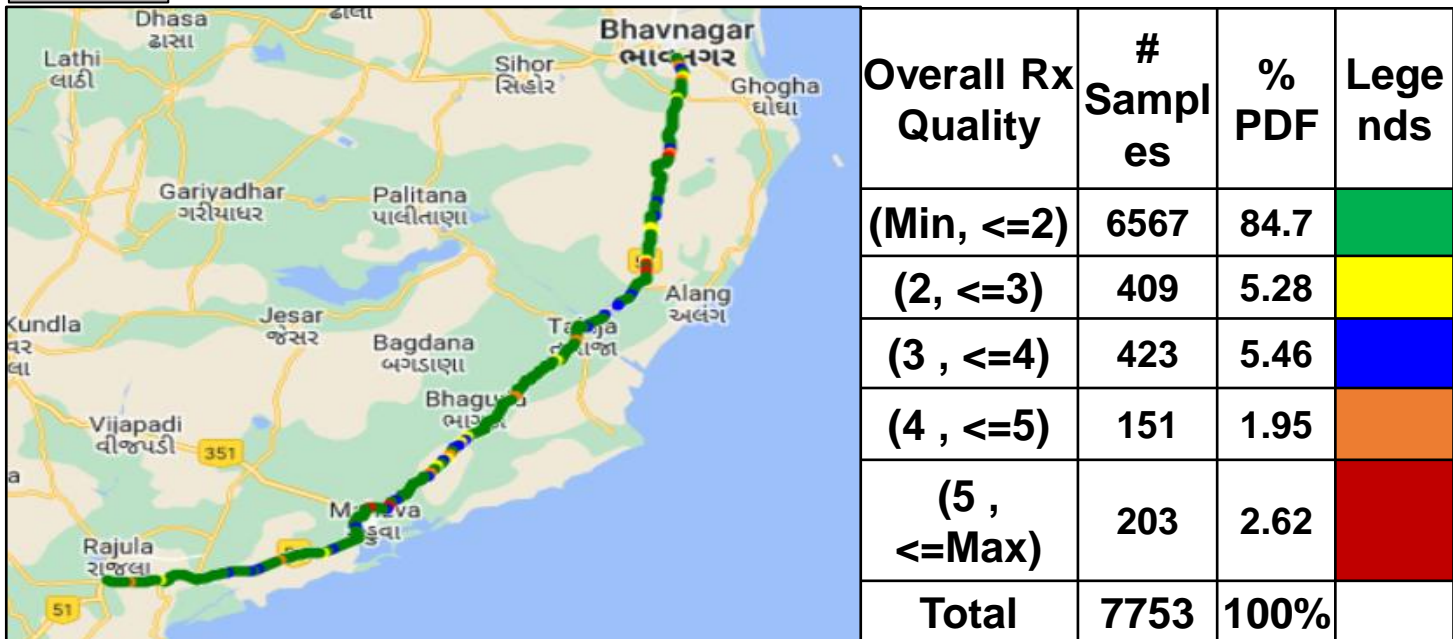
Overall SINR	# Samples	% PDF	Legends
(Min, ≤ 0)	1274	8.51%	
(0, ≤ 5)	1865	12.45%	
(5, ≤ 10)	2921	19.50%	
(10, ≤ 15)	3202	21.38%	
(15, \leq Max)	5714	38.15%	
Total	14976	100%	

II. Quality Details

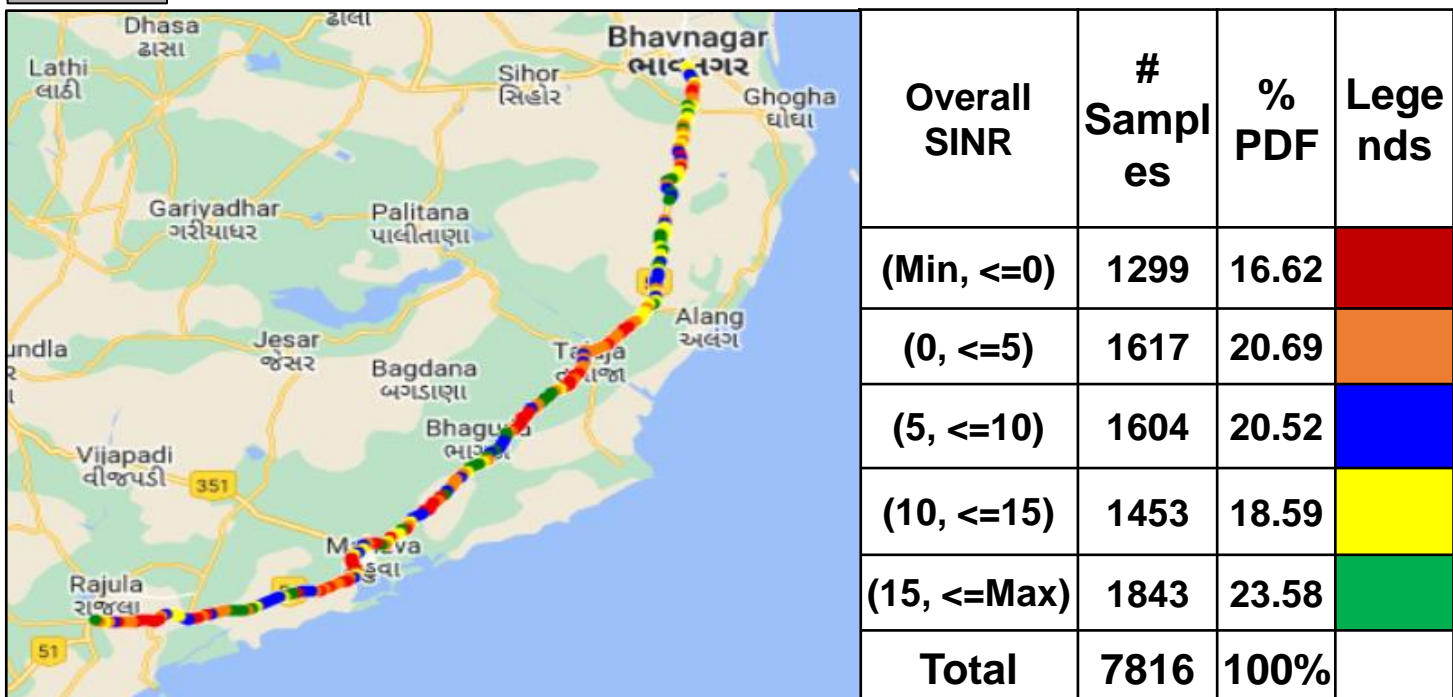
VIL

Technology	Rx Quality %
2G	97.38%
4G	83.38%

2G



VoLTE



III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL VoLTE	20.37%
Airtel VoLTE	100.00%
Jio VoLTE	100.00%
VIL VoLTE	100.00%

