



Operator Assisted Drive Test Report

Kevadia to Dakorji Highway Route

17 March 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 Kevadia to Dakorji Highway Route from 9:00 AM to 8:00 PM during 17th March 2024. The drive test covered drive route of 151 KMs & over a period of 1 day. Approximately 135 calls were made for each of the networks: three 2G networks, one 3G networks and three LTE networks covering four TSPs.

Overview

Voice Summary

Data Summary

Overview

Regional Office, TRAI Jaipur conducted Operator Assisted Drive Test from 17th March 2024 to 20th March 2024 covering **Kevadia to Dakorji Highway Route**. 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 151 KMs. Approximately 135 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 151 kms for download throughput in all technologies.
2G – measurement – UE Locked in 2G file size- 500KB

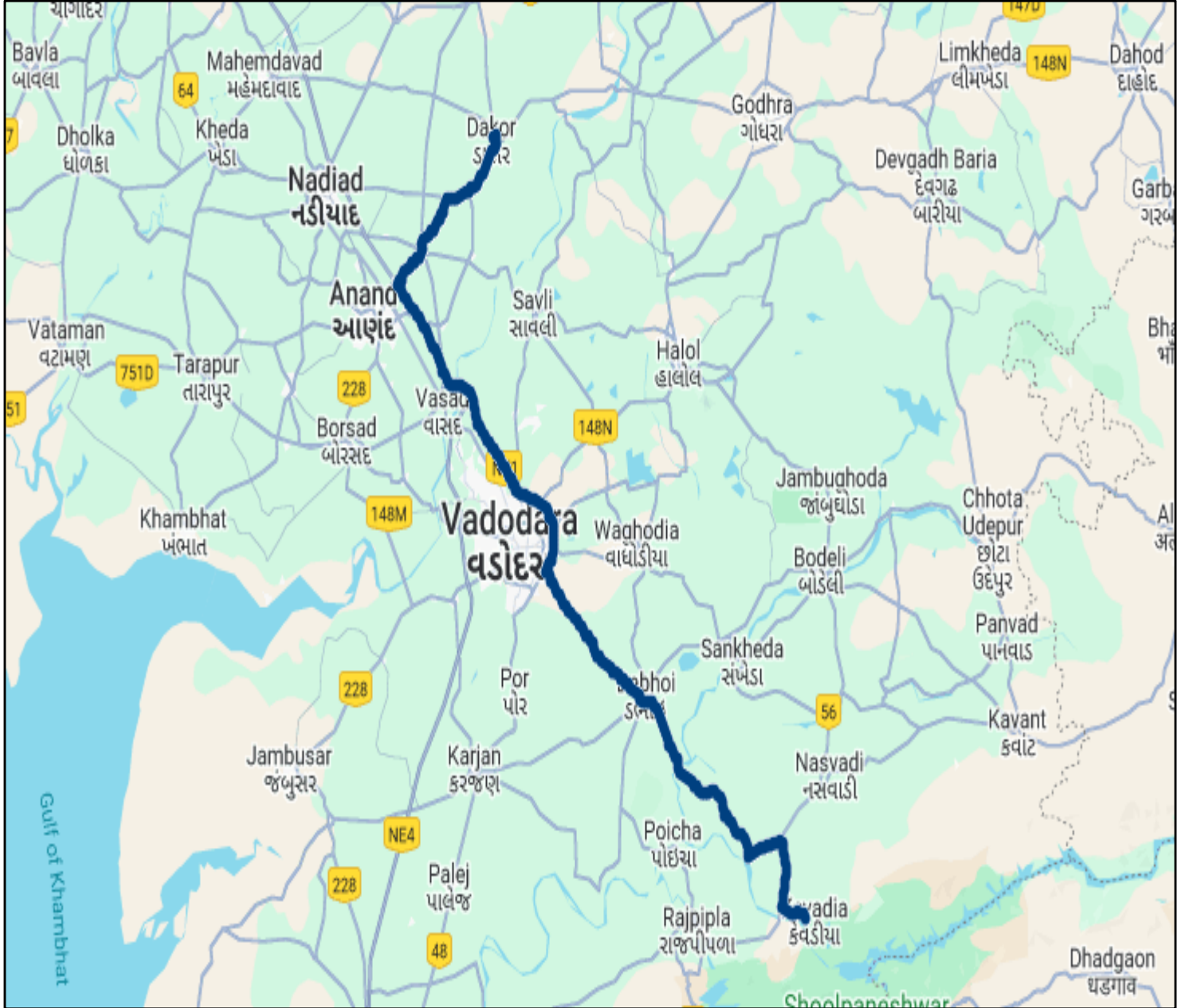
3G – measurement – UE in 3G File Size- 20MB

4G – measurement – UE in LTE 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

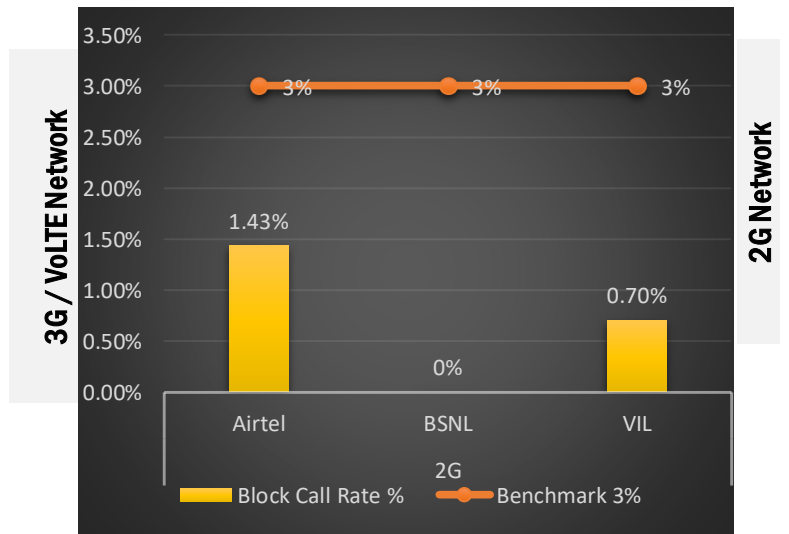
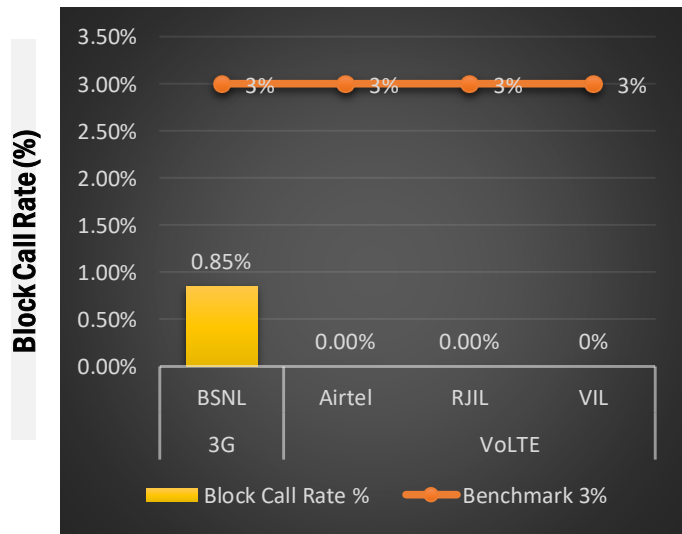
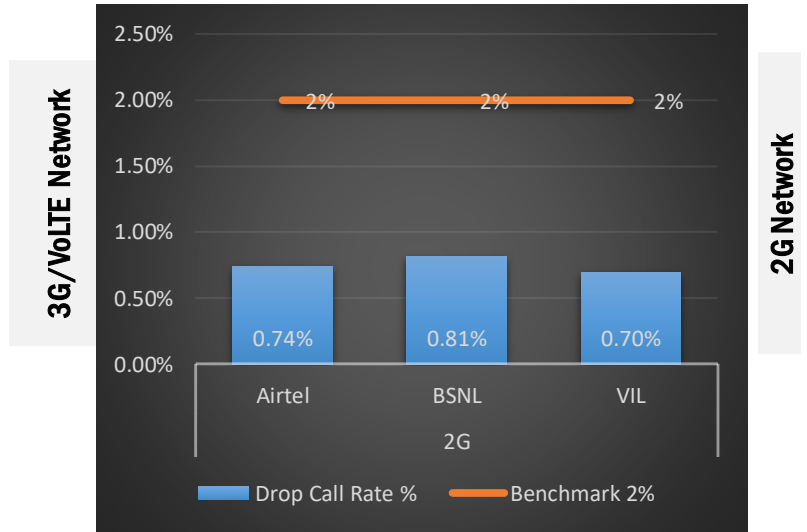
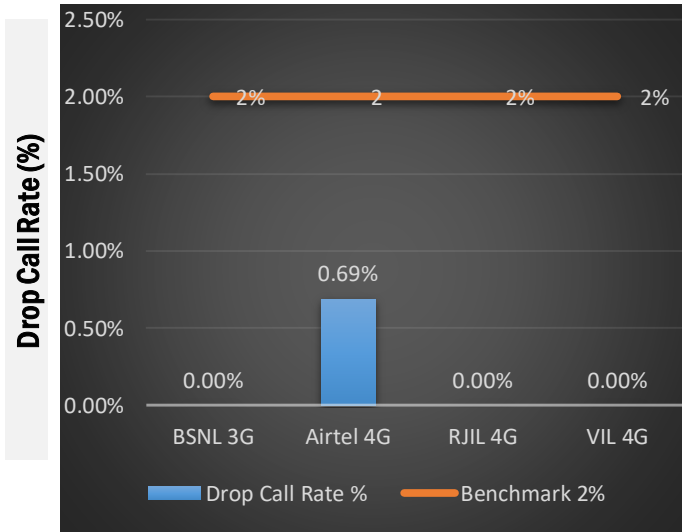
Overview

Voice & Dynamic Data Test Drive Route



Date	Test Scenario	Area to be Covered
17-03-24	2G/3G/4G Voice and 3G/4G Dynamic Data	Starting Point : Statue of Unity, Kevadia to DakorJi Temple

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



KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0.74%	0.81%	0.70%	0.00%	0.69%	0.00%	0.00%
Block Call Rate %	1.43%	0.00%	0.70%	0.85%	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 %	77.8%	69.64%	99.87%

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

TSPs	3G
	BSNL
Coverage %	49.85%

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	92.35%	97.91%	88.47%

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

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	69.21%	96.33%	100.00%	97.76%

Data Services Dynamic

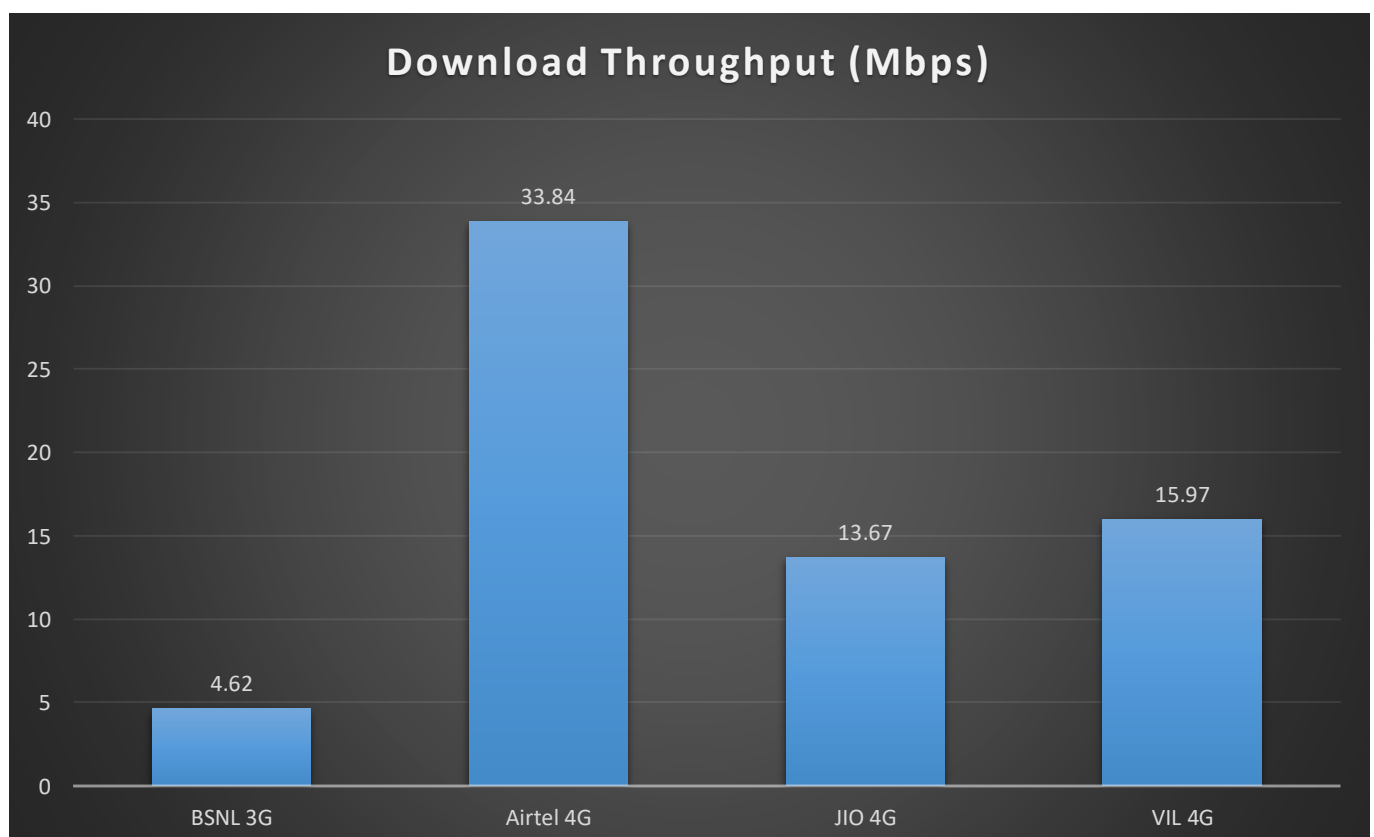
Key Observations

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)	4.62	33.84	13.67	15.97



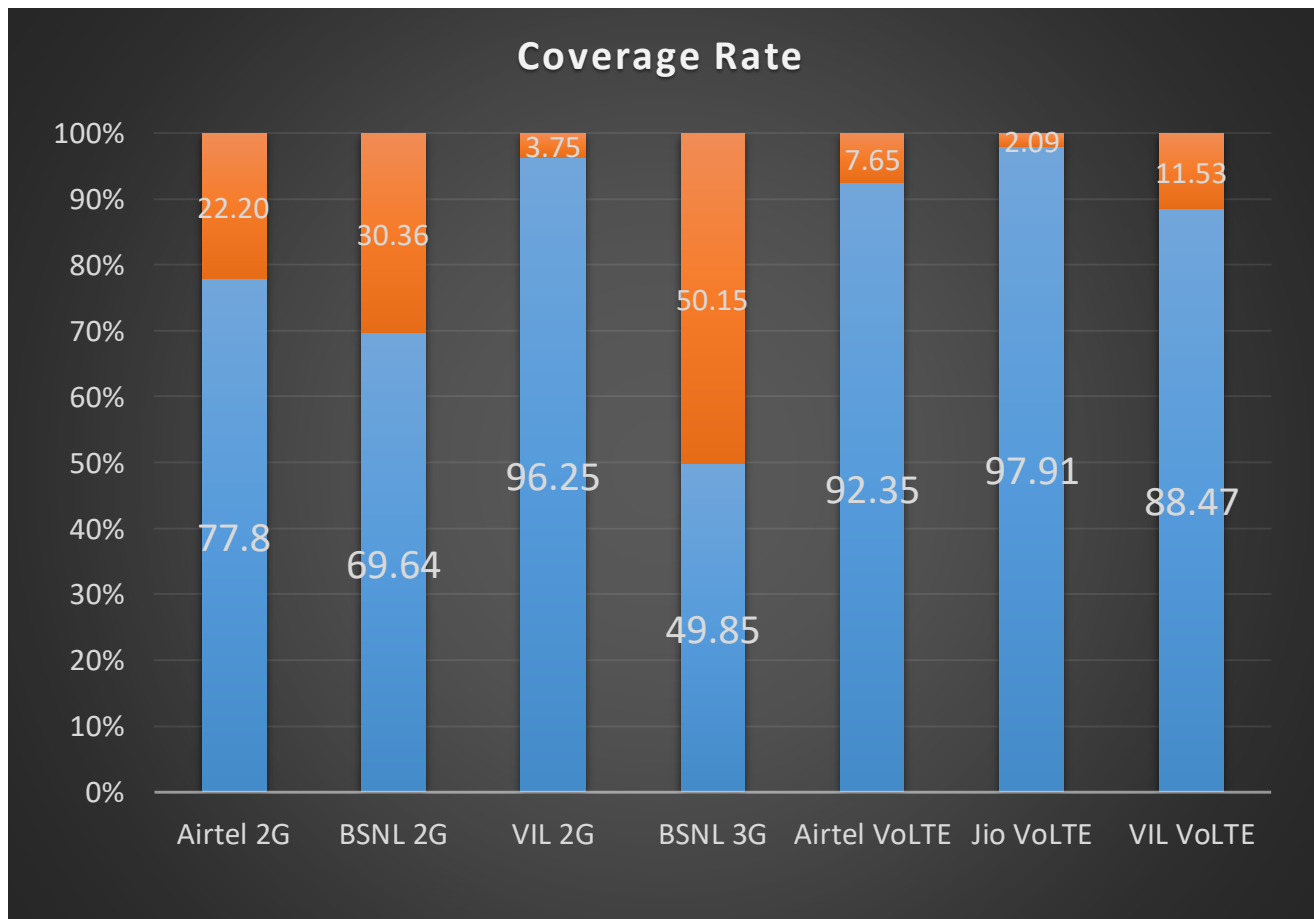
Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	140	123	144
Blocked Call Rate (%)	1.43%	0.00%	0.69%
CSSR% (Accessibility)	98.57%	100%	99.31%
Drop Call Rate (%)	0.74%	0.81%	0.69%
Mobility HOSR (%)	99.14%	91.2%	99.26%
Rx Quality (%)	94.99%	95.97%	96.05%
Average CST Sec	3.26	2.25	3.17

Voice Call	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	117	144	138	149
Blocked Call Rate (%)	0.85%	0.00%	0.00%	0.00%
CSSR% (Accessibility)	99.15%	100%	100%	100%
Drop Call Rate (%)	0.00%	0.69%	0.00%	0.00%
Mobility HOSR (%)	95.92%	99.2%	99.89%	99.73%
Rx Quality (%)	96.05%	89.96%	93.41%	84.61%
Average CST Sec	2.55	1.07	0.71	0.42

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	77.8%
BSNL 2G	69.64%
VIL 2G	96.25%
BSNL 3G	49.85%
Airtel VoLTE	92.35%
Jio VoLTE	97.91%
VIL VoLTE	88.47%

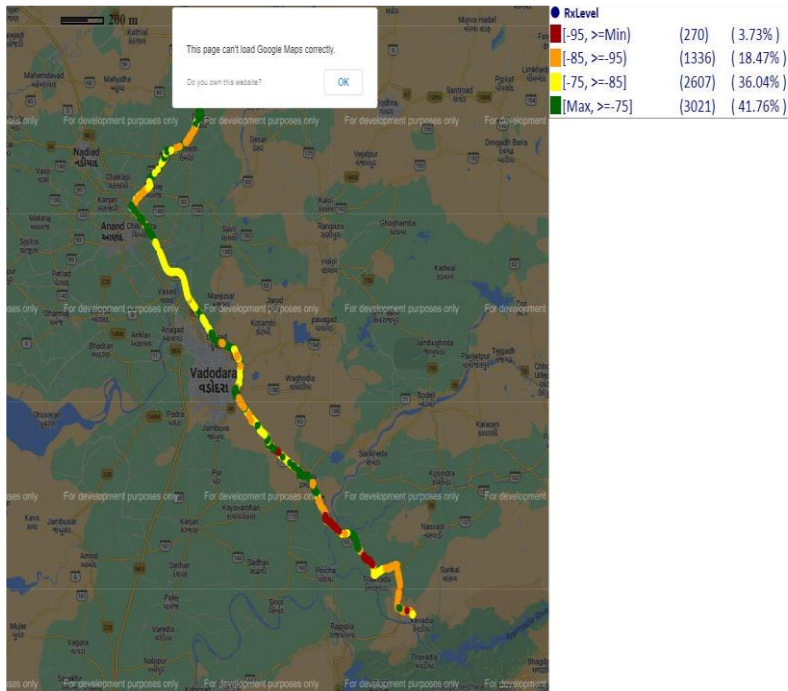


Coverage Details

TSP-AIRTEL

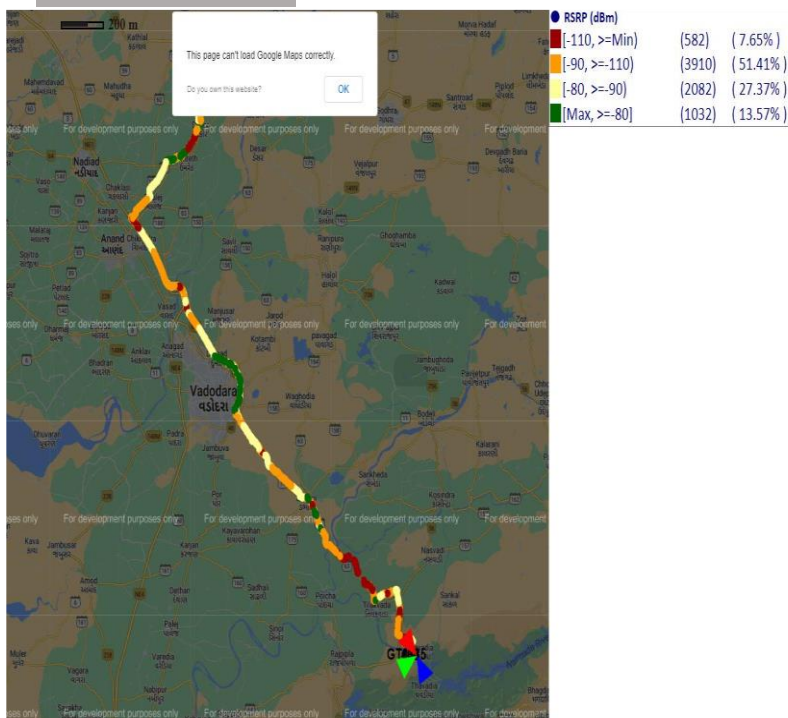
Technology	Coverage %
2G	77.80%
VoLTE	92.35%

2G



2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	3021	41.76%	
[-75, >=-85)	2607	36.04%	
[-85, >=-95)	1336	18.47%	
[-95, >=Min)	270	3.73%	
Total	7234	100%	

VoLTE



VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	1032	13.57%	
[-80, >=-90)	2082	27.37%	
[-90, >=-110)	3910	51.41%	
[-110, >=Min)	582	7.65%	
Total	7606	100%	

Coverage Details

TSP- BSNL

Technology

Coverage %

2G

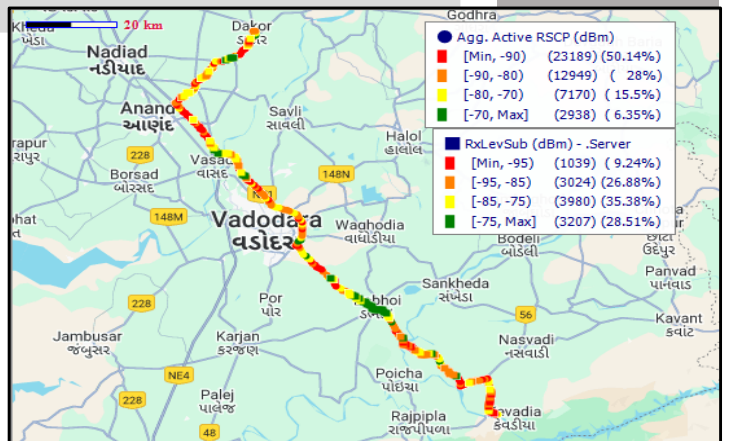
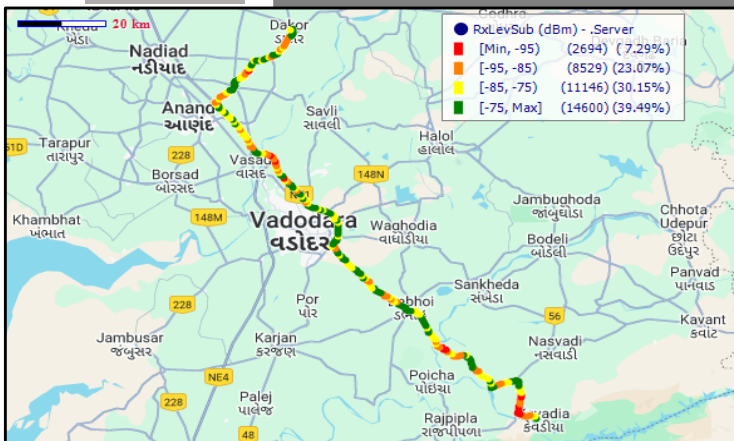
69.64%

2G

3G

49.86%

3G



2G

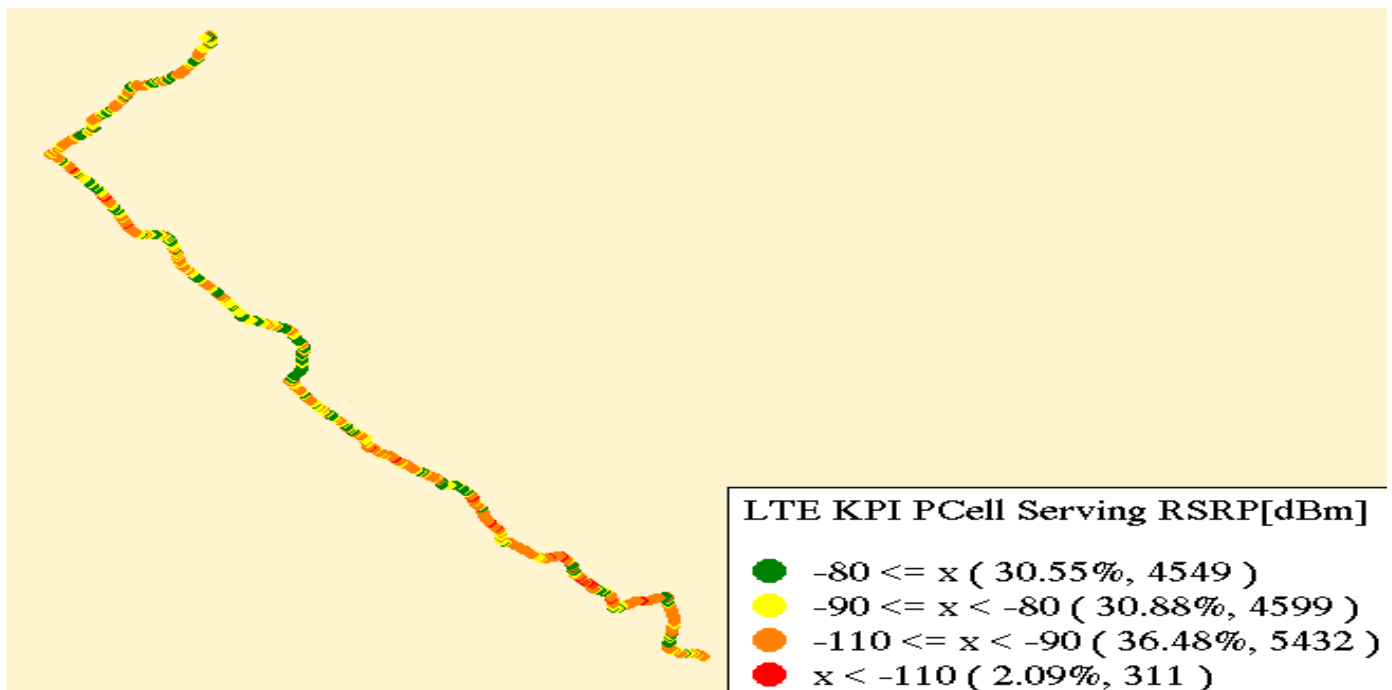
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	14600	39.49%	
[-75, >=-85)	11146	30.15%	
[-85, >=-95)	8529	23.07%	
[-95, >=Min)	2694	7.29%	
Total	36969	100%	

3G

Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	2938	6.35%	
[-70, >=-80)	7170	15.51%	
[-80, >=-90)	12949	28%	
[-90, >=Min)	23189	50.14%	
Total	46246	100%	

JIO

Technology	Coverage %
VoLTE	97.91%

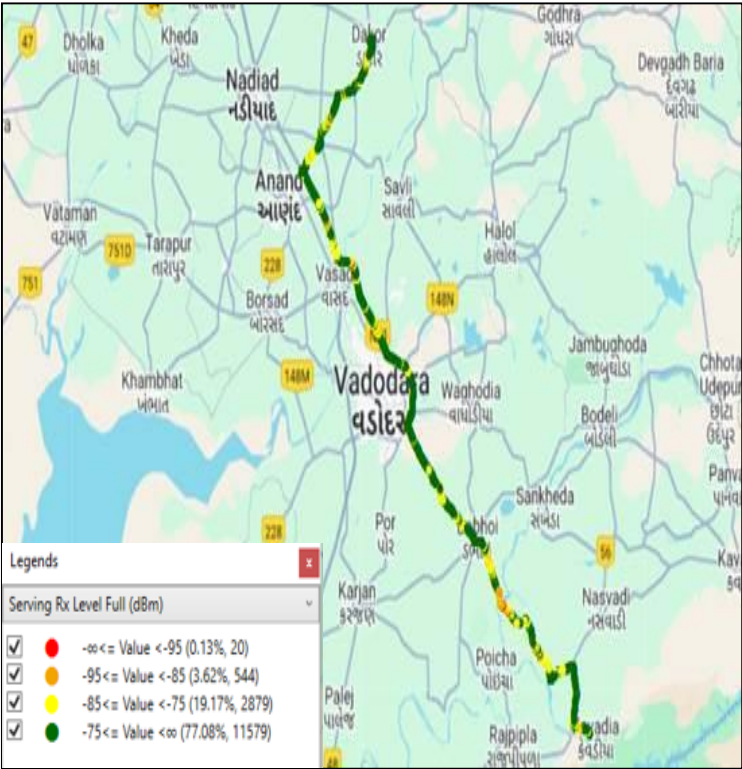


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	4549	30.55%	
[-80, >=-90)	4599	30.88%	
[-90, >=-110)	5432	36.48%	
[-110, >=Min)	311	2.09%	
Total	14891	100%	

VIL

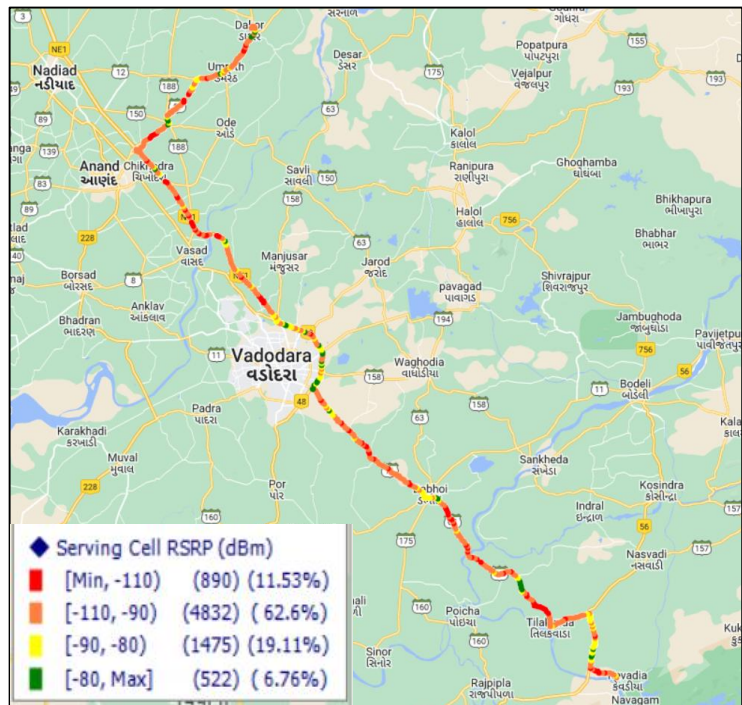
2G

Technology	Coverage Rate %
2G	96.25%
VoLTE	88.47%



2G			
Overall Rx Level	# Samples	% PDF	Legends
[Max, >=-75]	11579	77.08%	Green
[-75, >=-85)	2879	19.17%	Yellow
[-85, >=-95)	544	3.62%	Orange
[-95, >=Min)	20	0.13%	Red
Total	15022	100%	

VoLTE

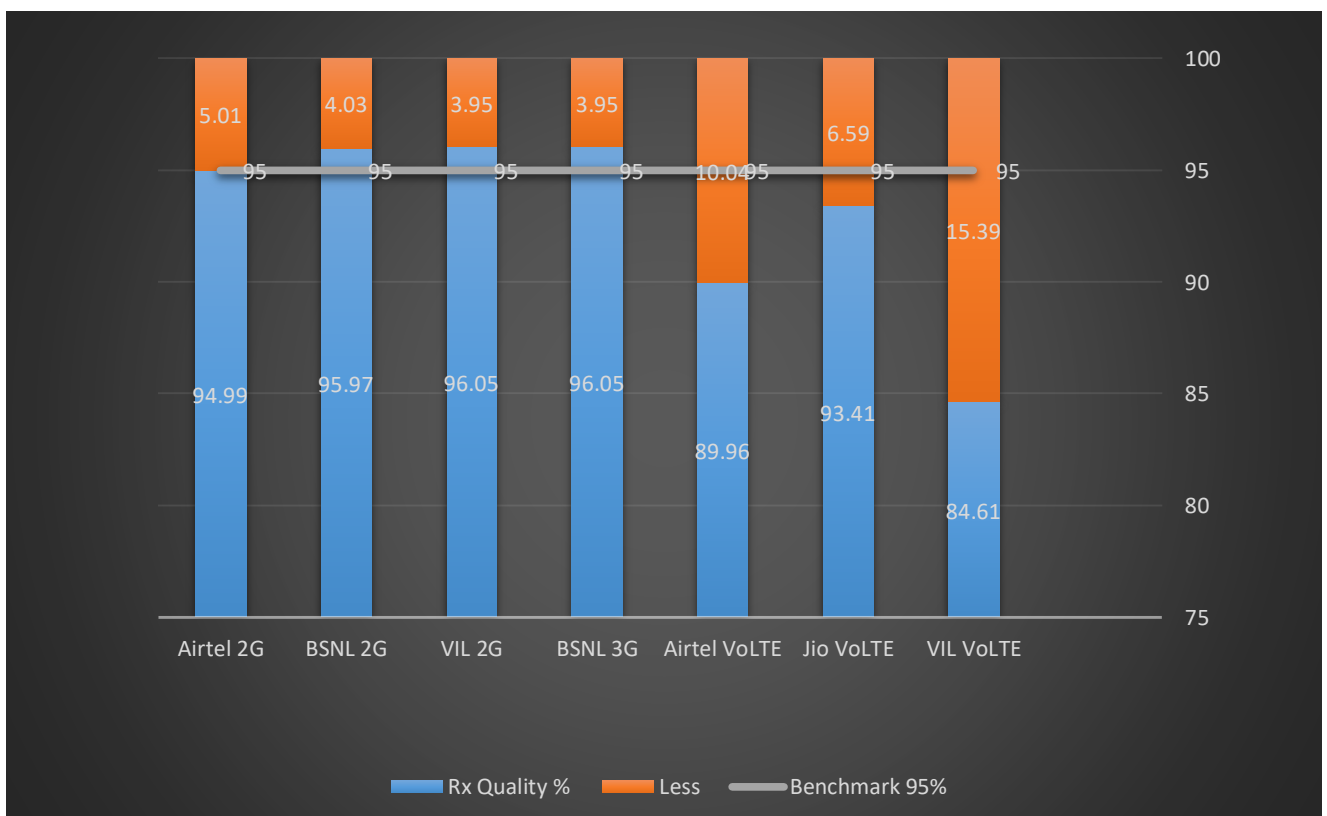


VoLTE			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	522	6.76%	Green
[-80, >=-90)	1475	19.11%	Yellow
[-90, >=-110)	4832	62.6%	Orange
[-110, >=Min)	890	11.53%	Red
Total	7719	100%	

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 $\geq 95\%$.

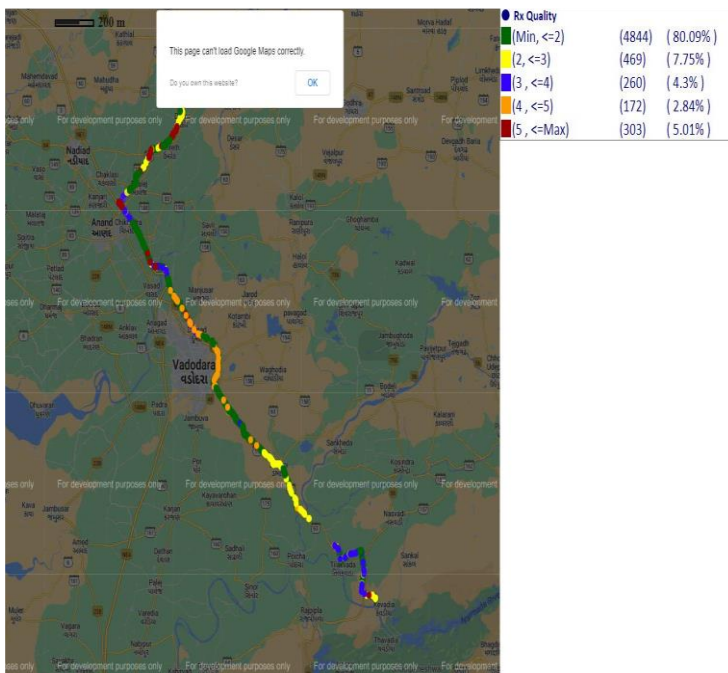
<u>TSP</u>	Rx Quality %
Airtel 2G	94.99%
BSNL 2G	95.97%
VIL 2G	96.05%
BSNL 3G	96.05%
Airtel VoLTE	89.96%
Jio VoLTE	93.41%
VIL VoLTE	84.61%



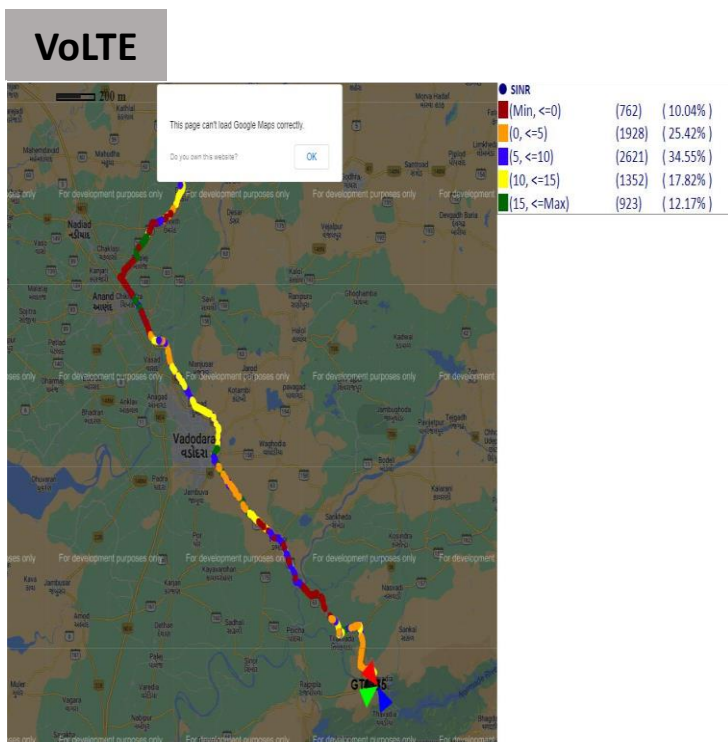
II. Quality Details

Airtel

	Technology	Rx Quality %
	2G	94.99%
2G	VoLTE	89.96%



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	4844	80.09%	Green
(2, <=3)	469	7.75%	Yellow
(3, <=4)	260	4.30%	Blue
(4, <=5)	172	2.84%	Orange
(5, <=Max)	303	5.01%	Red
Total	6048	100%	



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	762	10.04%	Red
(0, <=5)	1928	25.42%	Orange
(5, <=10)	2621	34.55%	Blue
(10, <=15)	1352	17.82%	Yellow
(15, <=Max)	923	12.17%	Green
Total	7586	100%	

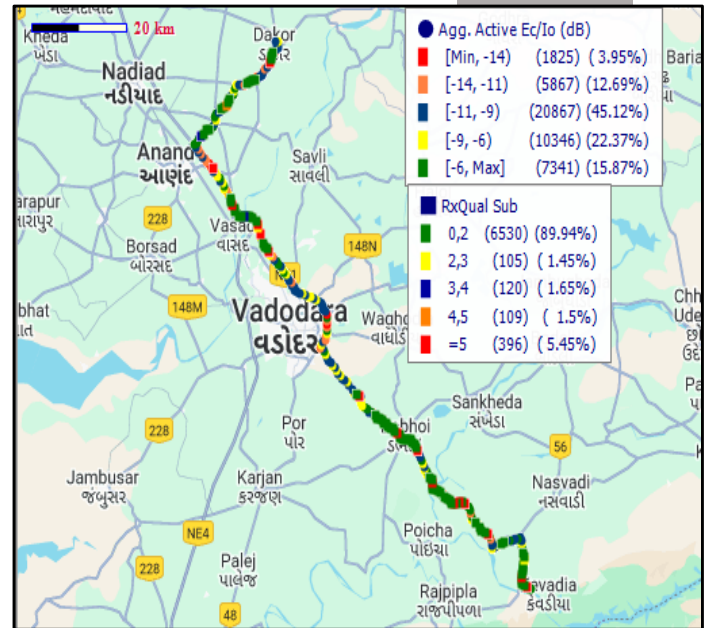
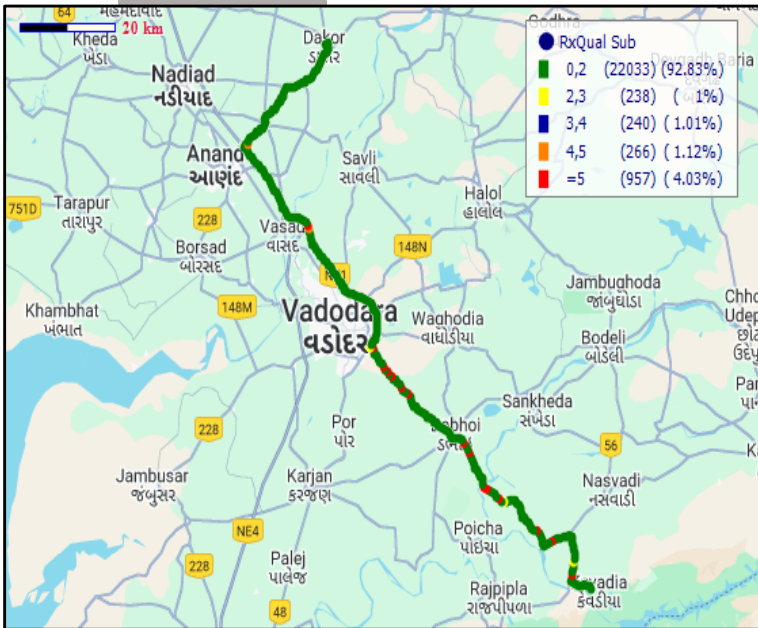
II. Quality Details

BSNL

Technology	Rx Quality %
2G	95.97%
3G	96.05%

2G

3G



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	22033	92.83%	
(2, <=3)	238	1%	
(3, <=4)	240	1.01%	
(4, <=5)	266	1.12%	
(5, <=Max)	957	4.03%	
Total	23734	100%	

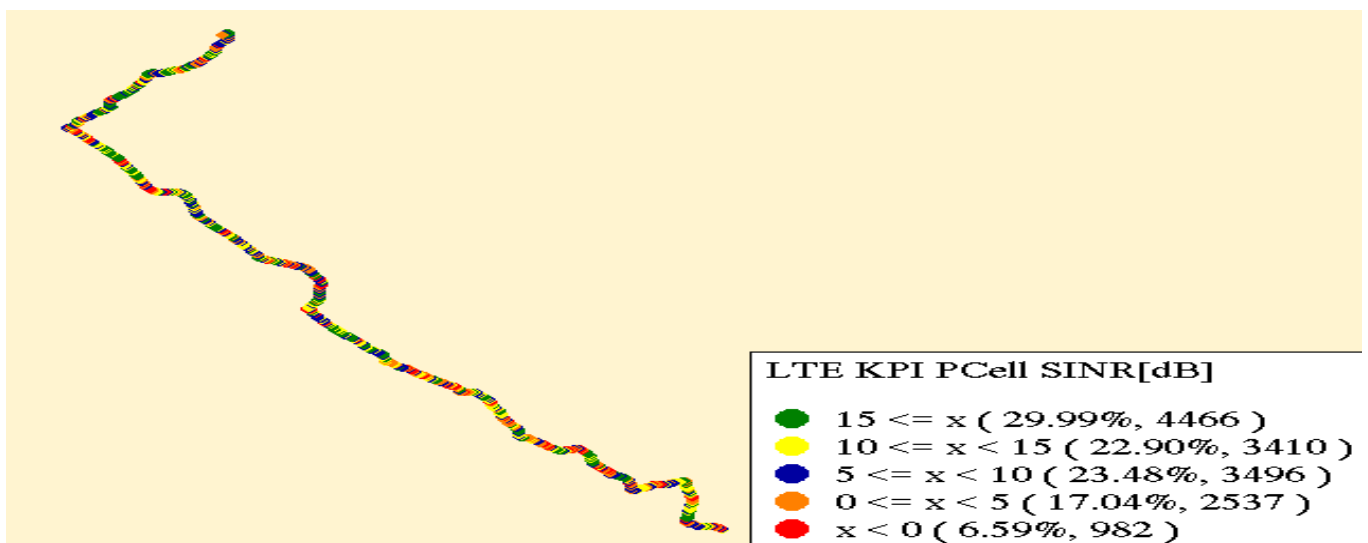
Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	7341	15.87%	
(-6, <=-9)	10346	22.37%	
(-9, <=-11)	20867	45.12%	
(-11, <=-14)	5867	12.69%	
(-14, <= Min)	1825	3.95%	
Total	46246	100%	

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	93.41%



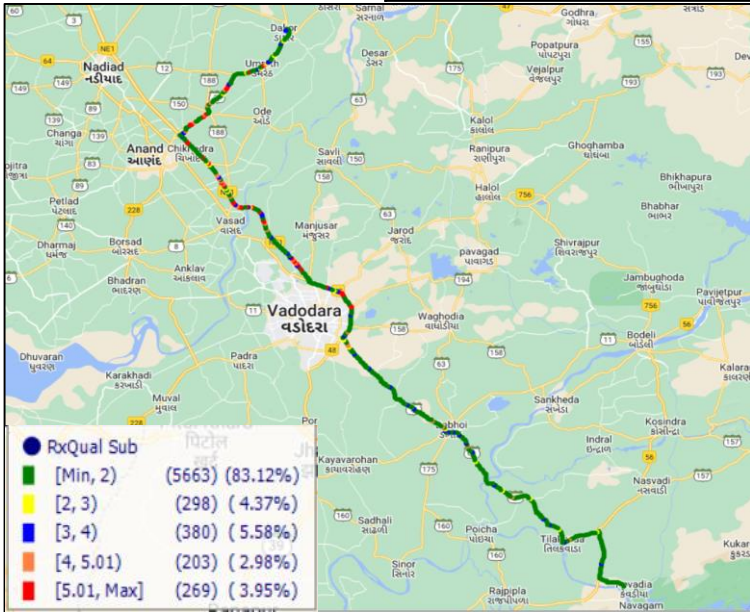
Overall SINR	# Samples	% PDF	Legends
(Min, ≤ 0)	982	6.59%	
(0, ≤ 5)	2537	17.04%	
(5, ≤ 10)	3496	23.48%	
(10, ≤ 15)	3410	22.9%	
(15, \leq Max)	4466	29.99%	
Total	14891	100%	

II. Quality Details

VIL

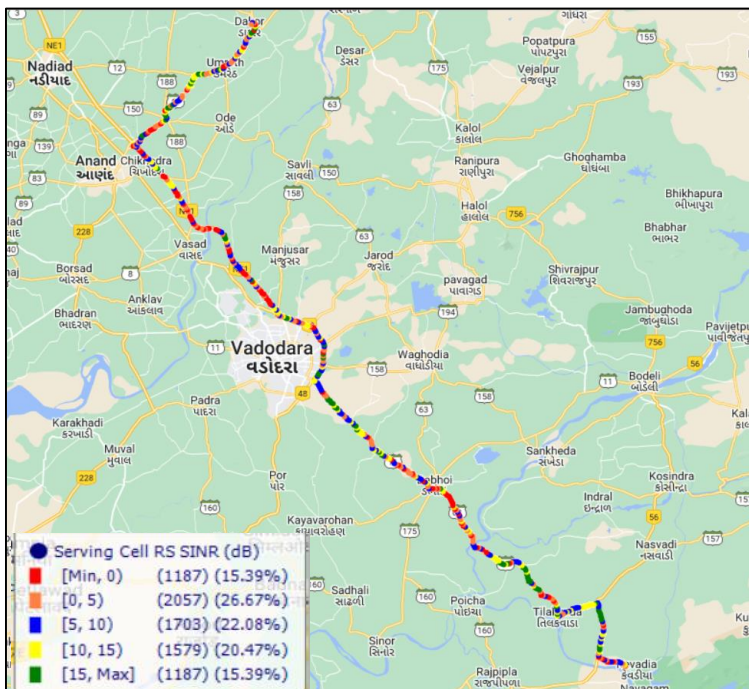
2G

Technology	Rx Quality %
2G	96.05%
4G	84.61%



Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	5663	83.12%	Green
(2, <=3)	298	4.37%	Yellow
(3, <=4)	380	5.58%	Blue
(4, <=5)	203	2.98%	Orange
(5, <=Max)	269	3.95%	Red
Total	6813	100%	

VOLTE



Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	1187	15.39%	Red
(0, <=5)	2057	26.67%	Orange
(5, <=10)	1703	22.08%	Blue
(10, <=15)	1579	20.47%	Yellow
(15, <=Max)	1187	15.39%	Green
Total	7713	100%	

III. Technology Details

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	69.21%
Airtel VoLTE	96.33%
Jio VoLTE	100.00%
VIL VoLTE	97.76%

