Operator Assisted Drive Test Report

Jaisalmer City
04th to 05th Dec'2024
By
TRAI Regional office Jaipur

<u>**Key Performance Indicators:**</u> **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 Jaisalmer City and Hotspot from 09:00 AM to 8:00 PM on 04th to 05th Dec'2024. The drive test covered drive route of 75 KMs & 7 no hotspots over a period of 2 days. Approximately 140 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 on 04th to 05th Dec'2024 covering Jaisalmer city. 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 74 KMs. Approximately 140 calls were made for each of the Jio 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 74 kms for download throughput in all technologies.
2G – measurement – UE Locked in 2G file size- 500KB
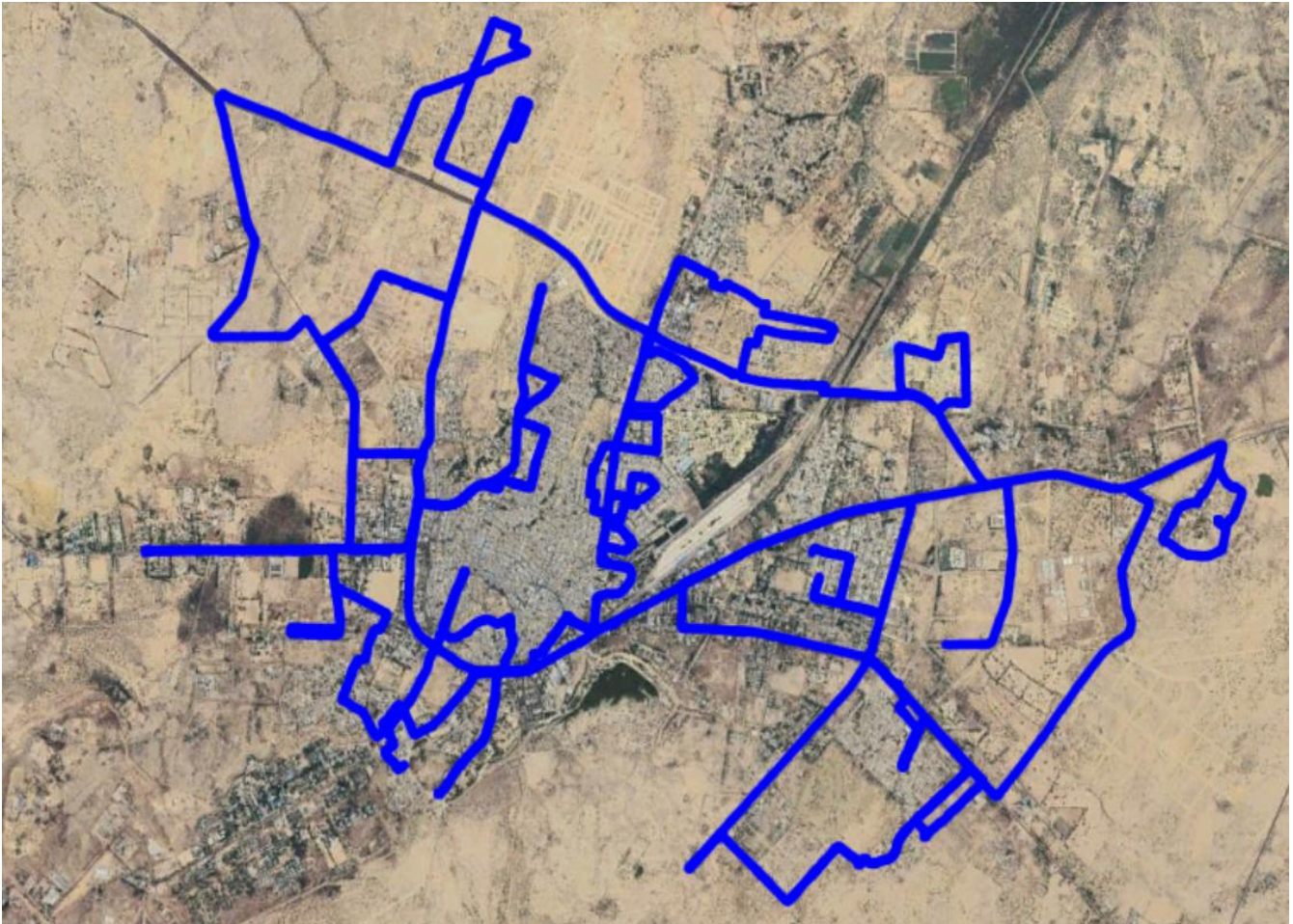
3G – measurement – UE in 3G File Size- 20MB

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

Static data tests on 7 hotspots

1. Collectrate Jaisalmer
2. Hanuman Circle Jaisalmer
3. Poonam Singh Stadium Jaisalmer
4. Neeraj Bus Stand Jaisalmer
5. Railway Station Jaisalmer
6. Airforce Circle Jaisalmer
7. Gadisar Circle Jaisalmer

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
04-Dec-24	2G/3G/4G Voice and 3G/4G Dynamic Data	Starting point:Collectorate & Hanuman circle,Priya Hospital,Mausam Bibhag Colony, BSF Sector North, Laxmi Chand Sanwal Colony,Jethwai Road,Deendayal Colony,Rewant Singh Dhani, Chocki Dhani,Babar Magra Kacchi Basti,DNP Colony,Air Port Road,Union Circle,Indra Colony, Railway station, Gadisar Circle, Nagar Palika,Bera Road, Air Force Main Gate,Vyas Colony,Neeraj Bus Stand,Fort Road,Air force Circle,Police line,Geeta Ashram,Malka Prol,Gaffur bhatta, Hinglaj Marg, RP Colony,RIICO Area,Darji Pada,Gandhi Colony.
05-Dec-24	Hot Spots- 2G/3G/4G Static Data Tests	Static Hotspot – 1) Collectorate Jaisalmer, 2) Hanuman Circle Jaisalmer, 3) Poonam Singh Stadium Jaisalmer, 4) Neeraj Bus Stand Jaisalmer, 5) Railway Station Jaisalmer, 6) Airforce Circle Jaisalmer, 7) Gadisar Circle Jaisalmer.

Overview

Data Service Test - Static Locations

Hotspot Locations
Location 1:- Collectrate Jaisalmer
Location 2:-Hanuman Circle Jaisalmer
Location 3:-Poonam Singh Stadium Jaisalmer
Location 4:-Neeraj Bus Stand Jaisalmer
Location 5:-Railway Station Jaisalmer
Location 6:-Airforce Circle Jaisalmer
Location 7:-Gadisar Circle Jaisalmer

Voice Calls

QoS compliance of the TSPs in **Jaisalmer City & Nearby area**
for Voice across technologies 2G/3G/4G-VoLTE:

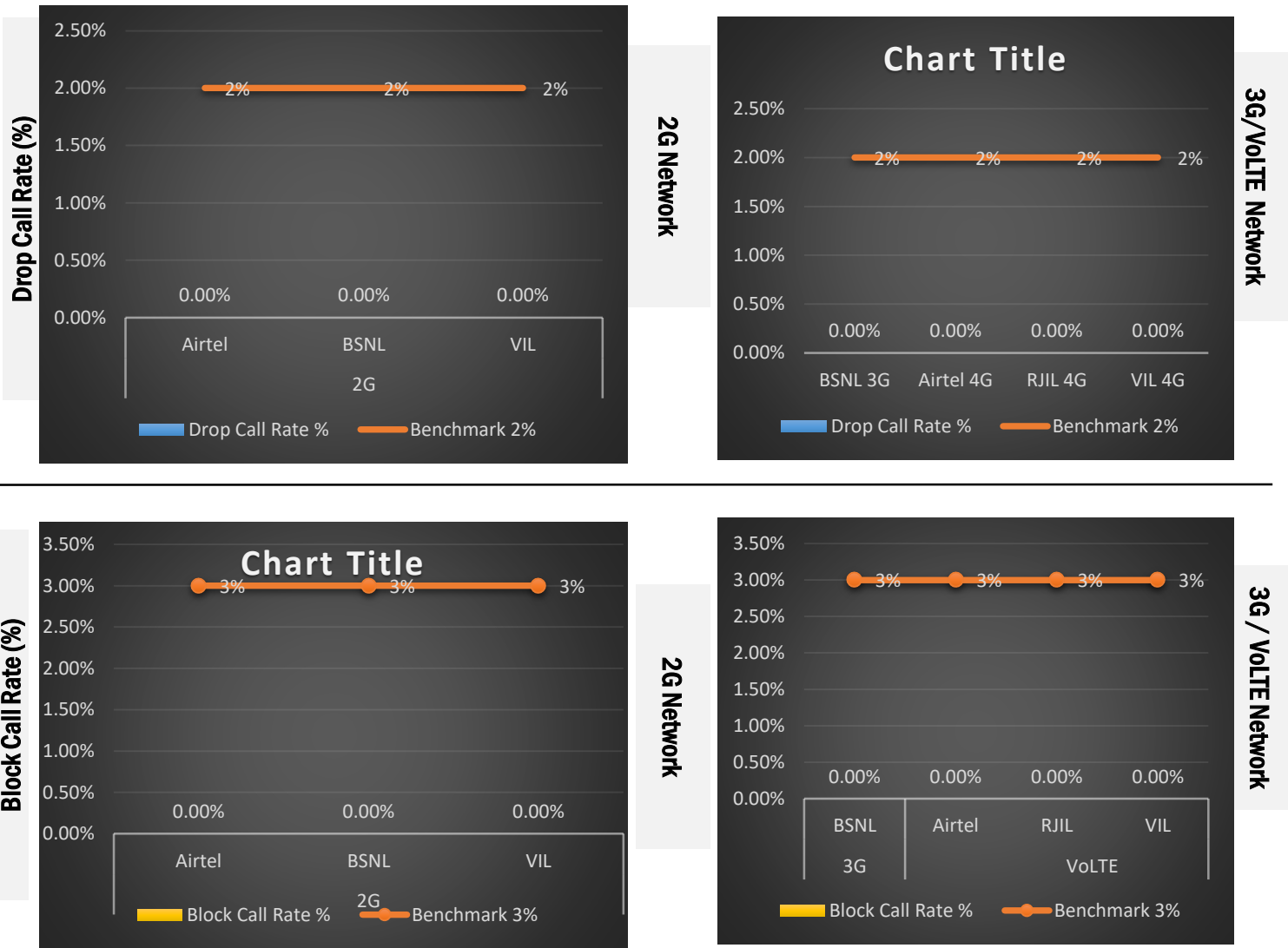| KPIs	2G			3G	4G		
	Airtel	**BSNL**	**VIL**	**BSNL**	**Airtel**	**RJIL**	**VIL**
Drop Call Rate %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Block Call Rate %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	72.42%	93.77%	67.91%

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

TSPs	3G
	BSNL
Coverage %	99.75%

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	99.86%	99.84%	97.37%

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

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent on 3G/4G Network %	13.61%	100%	100%	99.92%

Data Services Static

Data was tested at 5 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing (Flipkart, Amazon, Paytm)

Data Download and Upload Performance Static (Mbps)

3G/4G/ Network:

Download Throughput (Mbps) Static

Operator	Download Throughput (Mbps)
BSNL 3G	3.64
Airtel 4G	24.84
JIO 4G	48.46
VIL 4G	61.53

Upload Throughput (Mbps)

Operator	Upload Throughput (Mbps)
BSNL 3G	1.82
Airtel 4G	1.04
JIO 4G	30.7
VIL 4G	30.88

Latency (ms)

Latency (msec)

Operator	Latency (msec)
BSNL 3G	73.71
Airtel 4G	61.85
JIO 4G	49.14
VIL 4G	60.5

3G/VoLTE

Web Browsing (Sec)

Web Browsing Delay (sec)

Operator	Web Browsing Delay (sec)
BSNL 3G	9.94
Airtel 4G	6.43
JIO 4G	1.43
VIL 4G	3.82

Summary

Data Services Static	3G / 4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download Throughput (Mbps)	3.64	24.84	48.46	61.53
Upload Throughput(Mbps)	1.82	1.04	30.7	30.88
Video Streaming Delay (sec)	NA	0	0.39	1.58
Web Browsing Delay (sec)	9.94	6.43	1.43	3.82
Latency (msec)	73.71	61.85	49.14	60.5

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)	NA	21.34	24.32	16.67

Summary

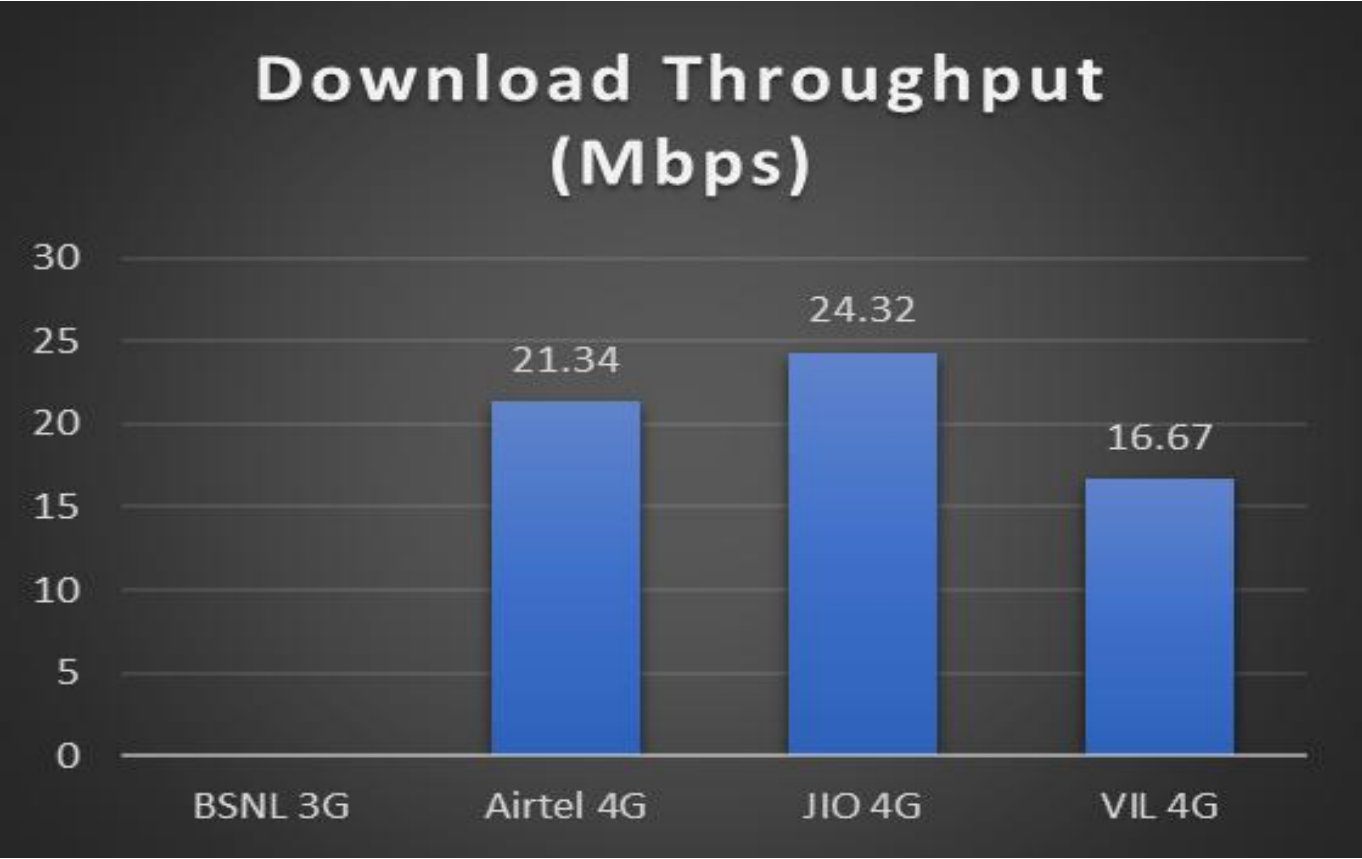| Voice Call	2G		
	Airtel	**BSNL**	**VIL**
Call Attempt	131	128	145
Blocked Call Rate (%)	0%	0%	0%
CSSR% (Accessibility)	100%	100%	100%
Drop Call Rate (%)	0%	0%	0%
Mobility HOSR (%)	96.51%	100%	96.4%
Rx Quality (%)	95.67%	98.37%	95.01%
Average CST Sec	3.52	3.23	2.91

Voice Call	3G/VoLTE			
	BSNL 3G	**Airtel VoLTE**	**JIO VoLTE**	**VIL VoLTE**
Call Attempt	89	133	141	150
Blocked Call Rate (%)	0%	0%	0%	0%
CSSR% (Accessibility)	100%	100%	100%	100%
Drop Call Rate (%)	0%	0%	0%	0%
Mobility HOSR (%)	100%	99.57%	99.49%	100%
Rx Quality (%)	95.95%	94.02%	91.05%	96.31%
Average CST Sec	4.59	1.85	0.62	0.32

Data Services static

Hanuman circle	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	3.82	30.21	49.08	31.89
Upload Throughput (mbps)	1.68	2.62	35.81	30.41
Video Streaming Delay (Secs.)	NA	0	0.34	1.6
Web Browsing Delay (sec)	7.9	6.07	1.5	2.05
Latency (msec)	59	51.7	50	53

Railway station	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	2.02	53.85	48.05	52.02
Upload Throughput (mbps)	1.94	1.07	38.46	25.52
Video Streaming Delay (Secs.)	NA	0	0.34	1.57
Web Browsing Delay (sec)	8.6	5.42	1.43	3.66
Latency (msec)	67	70.83	51	71

Neeraj Bus stand	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	4.68	27.14	42.94	68.72
Upload Throughput (mbps)	1.88	0.74	13.99	36.43
Video Streaming Delay (Secs.)	NA	0	0.33	1.57
Web Browsing Delay (sec)	11.4	7.34	1.55	3.76
Latency (msec)	73	61.87	46	50

Data Services static

Collectorate Office	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	4.51	19.85	61.12	86.85
Upload Throughput (mbps)	1.93	0.71	24.56	33.36
Video Streaming Delay (Secs.)	NA	0	0.32	1.58
Web Browsing Delay (sec)	9.5	6.1	1.5	3.82
Latency (msec)	62	63.33	60	60

Airforce circle	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	3.73	8.35	61.55	58.77
Upload Throughput (mbps)	1.92	0.64	34.3	22.65
Video Streaming Delay (Secs.)	NA	0	0.38	1.62
Web Browsing Delay (sec)	8.5	7.27	1.32	3.85
Latency (msec)	94	70.32	43	53

Gadisar	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	2.39	20.11	33.47	48.89
Upload Throughput (mbps)	1.71	0.74	35.9	31.26
Video Streaming Delay (Secs.)	NA	0	0.32	1.52
Web Browsing Delay (sec)	8.9	6.62	1.31	3.89
Latency (msec)	67	70.93	51	56

Data Services static

Poonam stadium	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	4.33	62.69	43.03	54.18
Upload Throughput (mbps)	1.73	13.99	31.89	36.07
Video Streaming Delay (Secs.)	NA	0	0.67	1.62
Web Browsing Delay (sec)	14.8	5.42	1.44	3.92
Latency (msec)	94	48.1	43	73

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	72.42%
BSNL 2G	93.77%
VIL 2G	67.91%
BSNL 3G	99.75%
Airtel VoLTE	99.86%
Jio VoLTE	99.84%
VIL VoLTE	97.37%
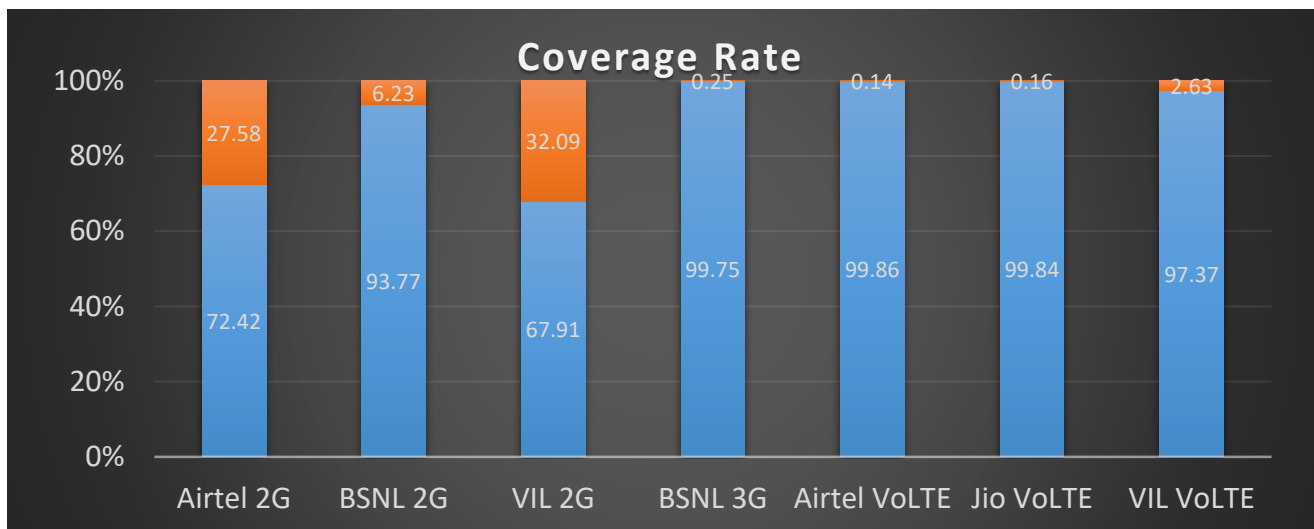
TSP-AIRTEL

Technology	Coverage %
2G	72.42%
VoLTE	99.86%

2G

● RxLevel
[-95, >=Min) (402) (5.75%)
[-85, >=-95) (1525) (21.82%)
[-75, >=-85) (2551) (36.51%)
[Max, >=-75] (2510) (35.92%)
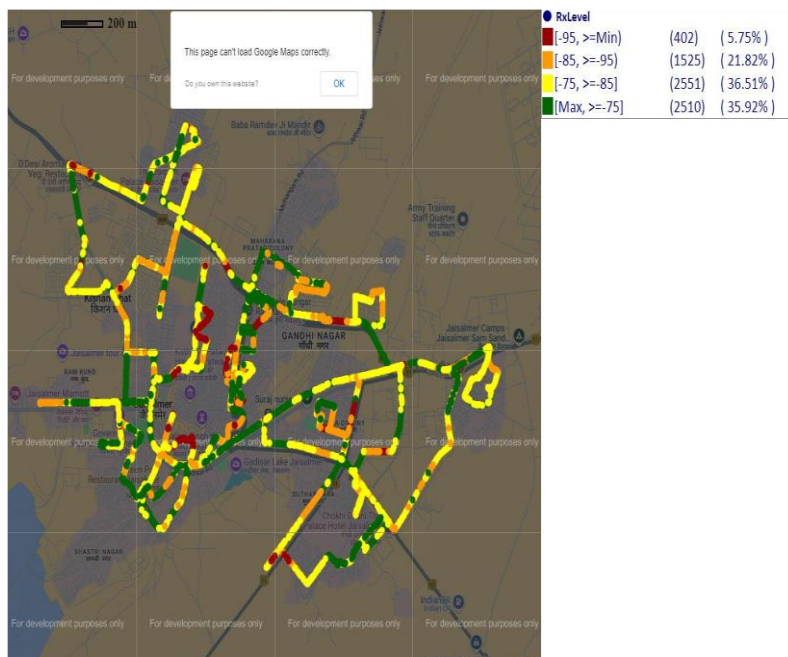
2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	2510	35.92%	🟩
[-75, >=-85)	2551	36.51%	🟨
[-85, >=-95)	1525	21.82%	🟧
[-95, >=Min)	402	5.75%	🟥
Total	6988	100%	

VoLTE

● RSRP (dBm)
[-110, >=Min) (10) (0.14%)
[-90, >=-110) (2261) (32.49%)
[-80, >=-90) (2960) (42.53%)
[Max, >=-80] (1729) (24.84%)
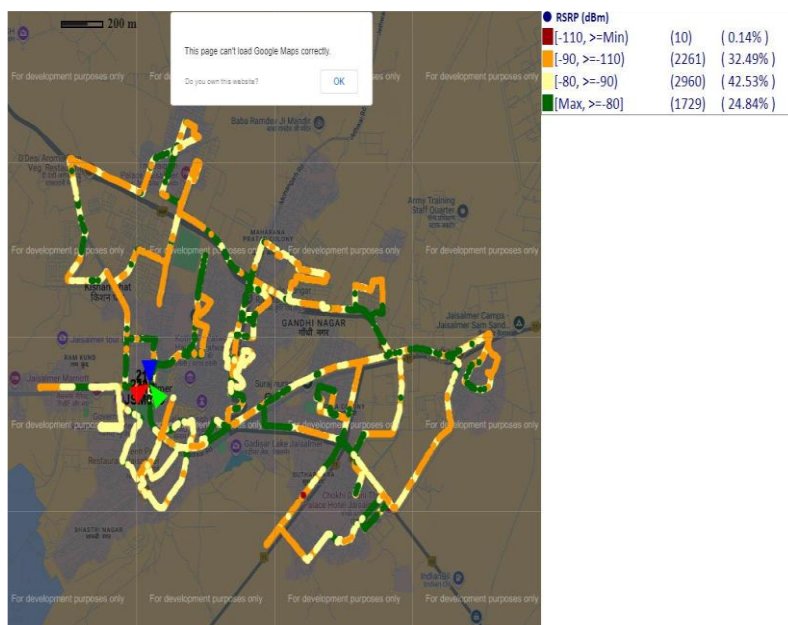
VoLTE /5G			
Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	1729	24.84%	🟩
[-80, >=-90)	2960	42.53%	🟨
[-90, >=-110)	2261	32.49%	🟧
[-110, >=Min)	10	0.14%	🟥
Total	6960	100%	

TSP- BSNL

Technology	Coverage %
2G	93.77%
3G	99.75%

2G

3G
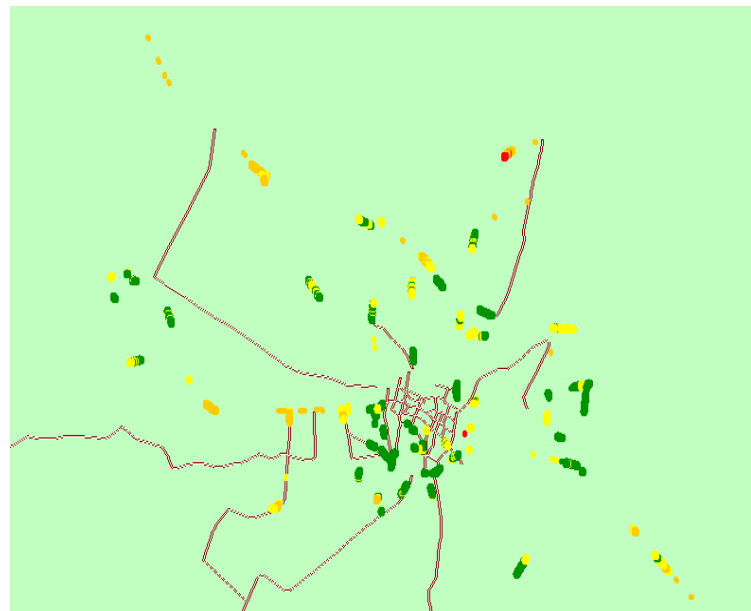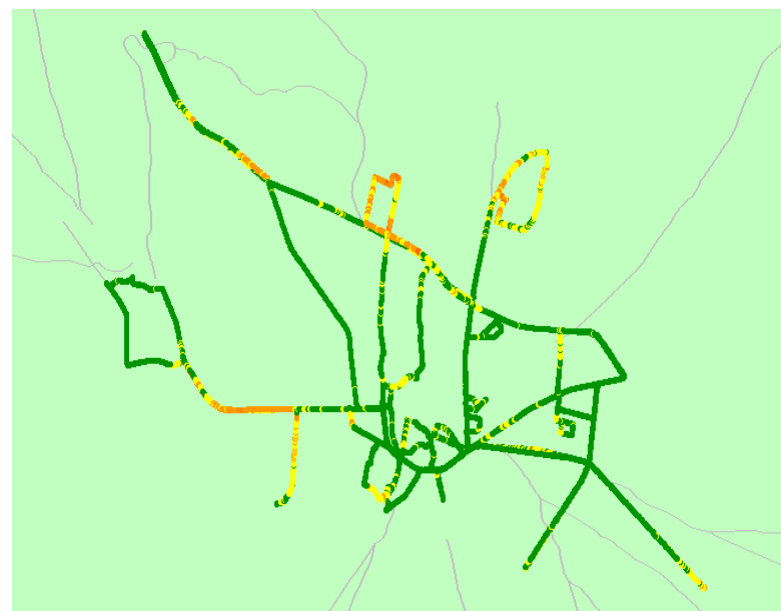
2G			
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	10352	76.74%	
[-75, >=-85)	2297	17.03%	
[-85, >=-95)	760	5.64%	
[-95, >=Min)	80	0.59%	
Total	13489	100%	

3G			
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-80]	1175	58.64%	
[-80, >=-90)	606	30.21%	
[-90, >=-110)	218	10.90%	
[-110, >=Min)	5	0.25%	
Total	2673	100%	

JIO

Technology	Coverage %
VoLTE	99.84%

LTE KPI PCell Serving RSRP[dBm]

- -80 <= x < 0 (51.86%, 7924)
- -90 <= x < -80 (28.81%, 4402)
- -110 <= x < -90 (19.18%, 2930)
- -140 <= x < -110 (0.16%, 24)

2365 m

Image © 2024 Airbus
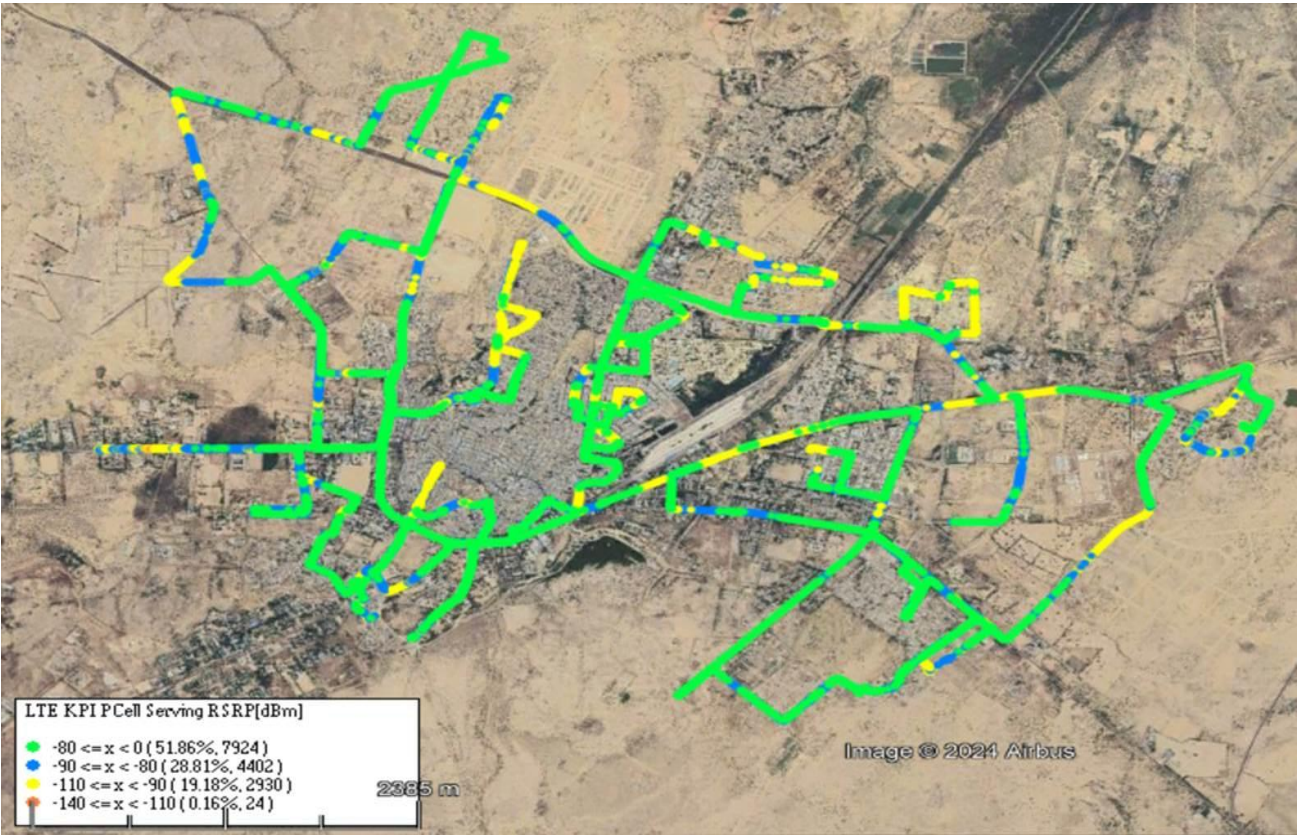
VoLTE			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	7924	51.86%	
[-80, >=-90)	4402	28.81%	
[-90, >=-110)	2930	19.17%	
[-110, >=Min)	24	0.16%	
Total	15280	100%	

VIL

Technology	Coverage Rate %
2G	67.19%
VoLTE	97.37%

2G

RxLevSub_Server
- -75 to -40 (33.80%) (5076)
- -85 to -75 (33.36%) (5010)
- -95 to -85 (27.93%) (4195)
- -130 to -95 (4.88%) (734)
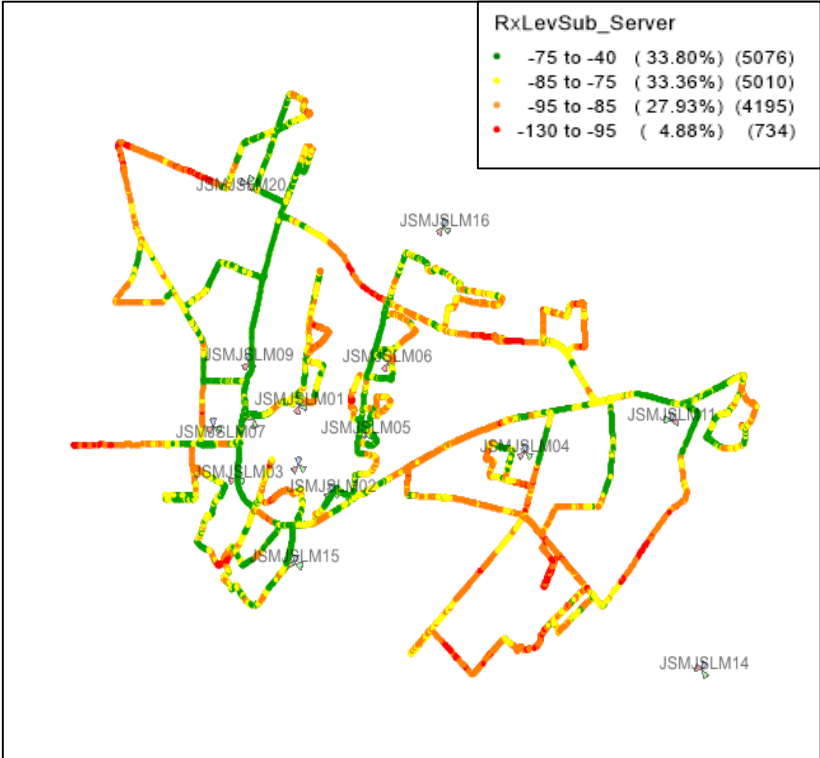
2G			
Overall RxLevel	**# Samples**	**% PDF**	**Legends**
[Max, >=-75]	5076	33.80%	🟩
[-75, >=-85)	5010	33.37%	🟨
[-85, >=-95)	4195	27.94%	🟧
[-95, >=Min)	734	4.89%	🟥
Total	15015	100%	

VoLTE

ServingCellRsrp
- -80 to -40 (11.03%) (1656)
- -90 to -80 (29.48%) (4425)
- -110 to -90 (56.83%) (8529)
- -140 to -110 (2.63%) (396)
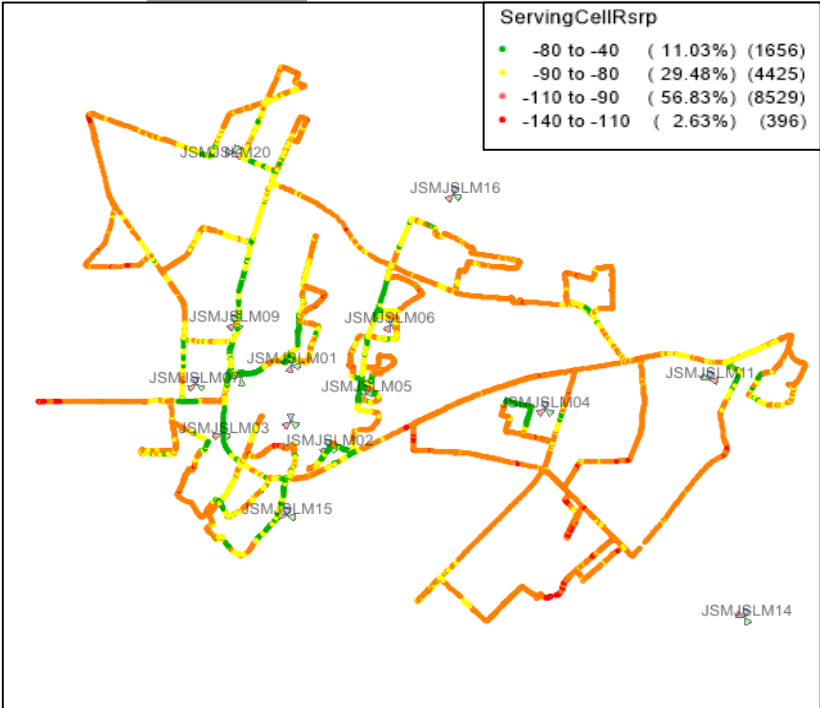
VoLTE /5G			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	1656	11.04%	🟩
[-80, >=-90)	4425	29.49%	🟨
[-90, >=-110)	8529	56.83%	🟧
[-110, >=Min)	396	2.64%	🟥
Total	15006	100%	

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%.

TSP	Rx Quality %
Airtel 2G	95.67%
BSNL 2G	98.37%
VIL 2G	95.01%
BSNL 3G	95.95%
Airtel VoLTE	94.02%
Jio VoLTE	91.05%
VIL VoLTE	96.31%
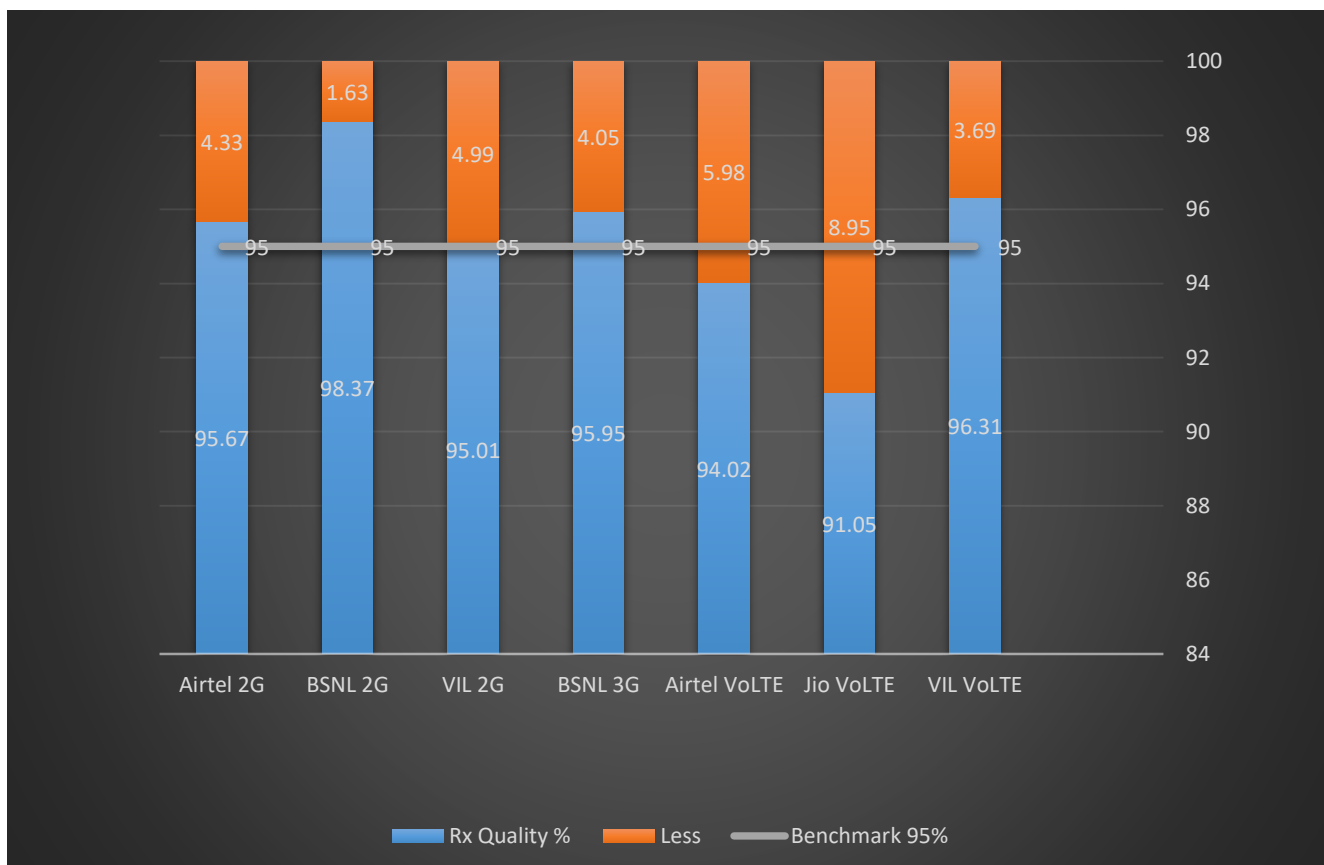
Airtel

Technology	Rx Quality %
2G	95.67%
VoLTE	94.02%

2G

Rx Quality
- (Min, <=2) (5300) (85.69%)
- (2, <=3) (372) (6.01%)
- (3, <=4) (140) (2.26%)
- (4, <=5) (105) (1.7%)
- (5, <=Max) (268) (4.33%)
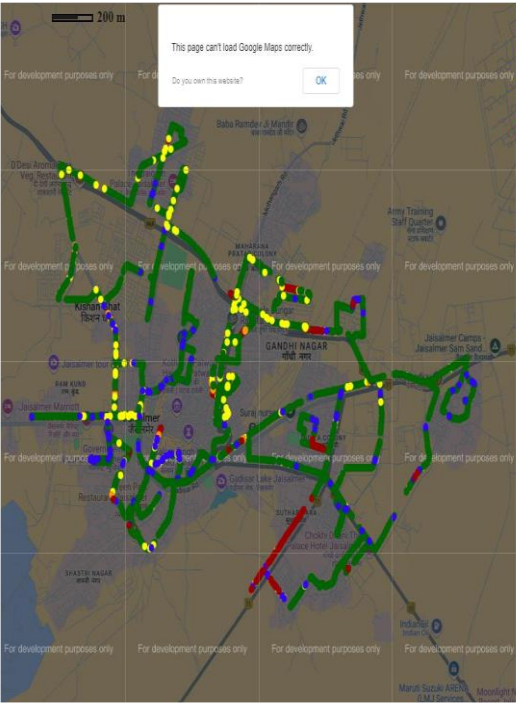
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	5300	85.70%	
(2, <=3)	372	6.01%	
(3, <=4)	140	2.26%	
(4, <=5)	105	1.70%	
(5, <=Max)	268	4.33%	
Total	6185	100%	

VoLTE

SINR
- (Min, <=0) (416) (5.98%)
- (0, <=5) (1631) (23.44%)
- (5, <=10) (2066) (29.69%)
- (10, <=15) (1333) (19.16%)
- (15, <=Max) (1513) (21.74%)
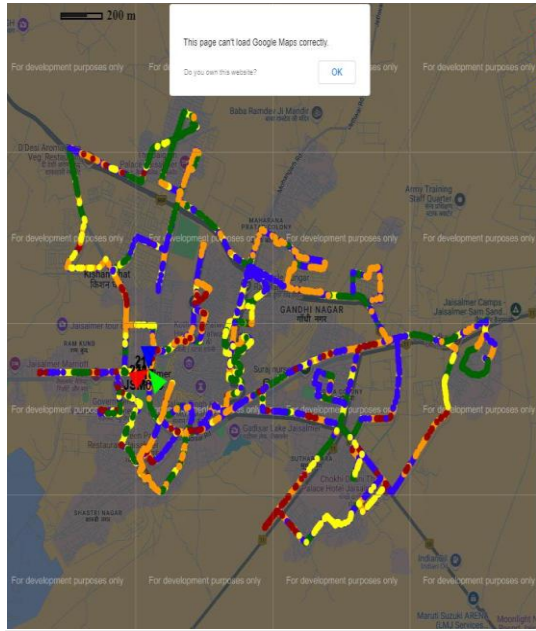
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	416	5.98%	
(0, <=5)	1631	23.44%	
(5, <=10)	2066	29.69%	
(10, <=15)	1333	19.16%	
(15, <=Max)	1513	21.73%	
Total	6959	100%	

BSNL

Technology	Rx Quality %
2G	98.39%
3G	95.95%

2G

3G
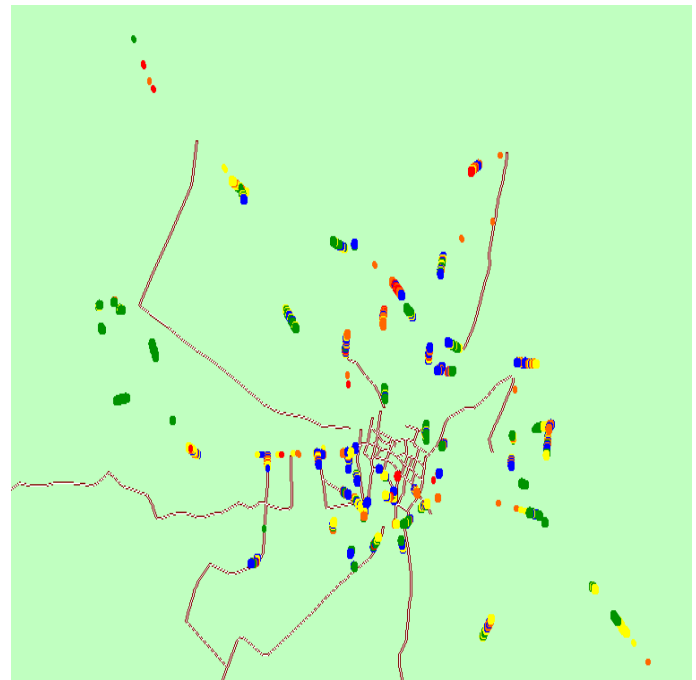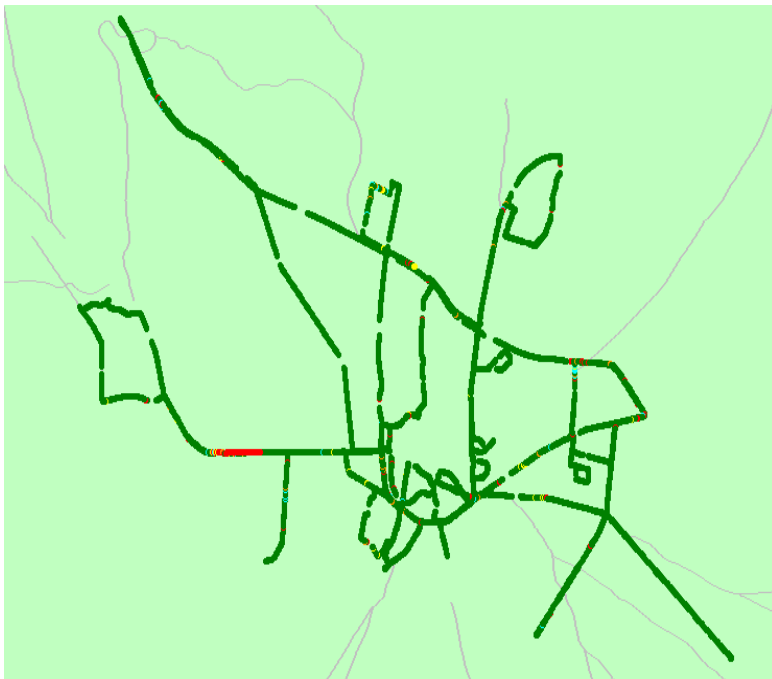
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	11458	96.62%	🟩
(2, <=3)	81	0.68%	🟨
(3 , <=4)	82	0.70%	🟦
(4 , <=5)	44	0.37%	🟧
(5 , <=Max)	193	1.63%	🟥
Total	11858	100%	

Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	599	29.86%	🟩
(-6, <=-9)	489	24.41%	🟨
(-9, <=-11)	517	25.79%	🟦
(-11, <=-14)	319	15.89%	🟧
(-14, <= Min)	81	4.05%	🟥
Total	2005	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	91.05%

LTE KPI PCell SINR[dB]
- 15 < x <= 30 (18.06%, 2759)
- 10 < x <= 15 (25.75%, 3935)
- 5 < x <= 10 (28.29%, 4323)
- 0 < x <= 5 (18.95%, 2896)
- -3 < x <= 0 (6.12%, 935)
- -6 < x <= -3 (2.50%, 382)
- -30 < x <= -6 (0.33%, 50)

2229 m

Image © 2024 Airbus
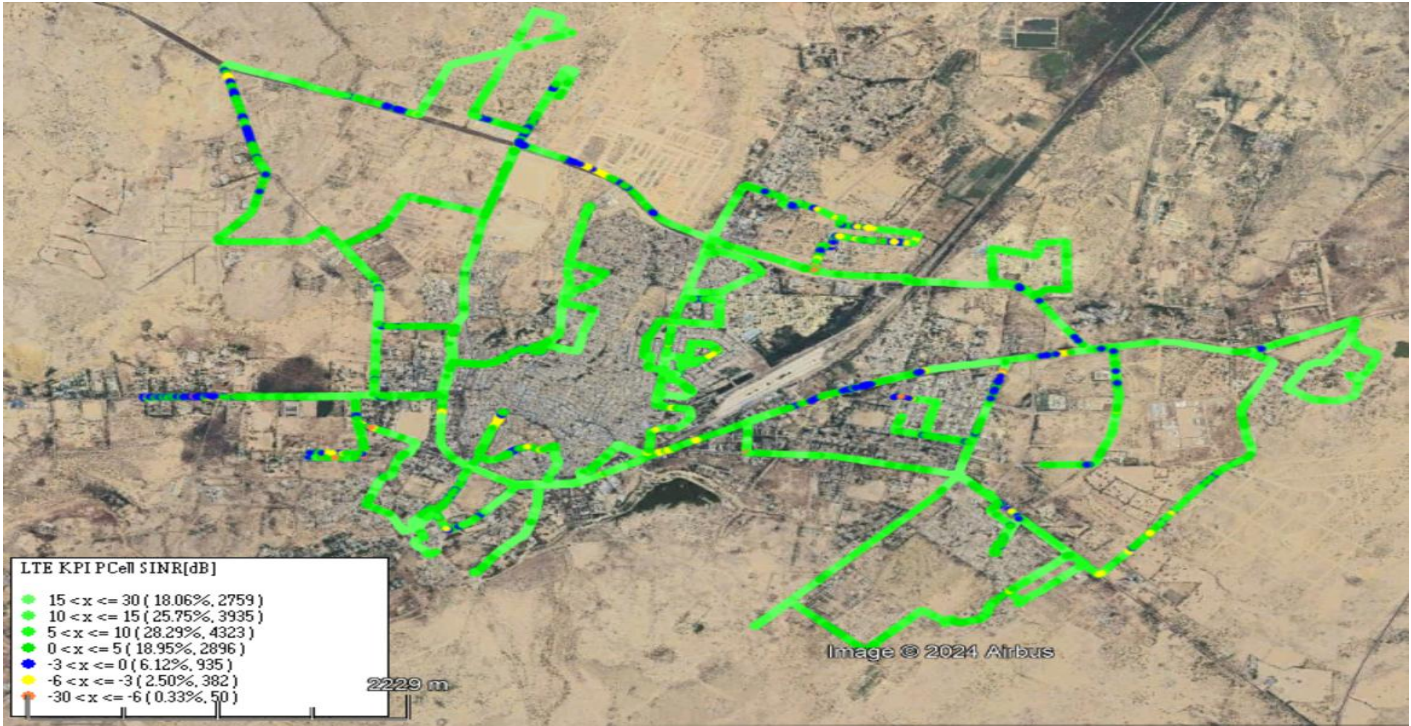
Overall SINR	# Samples	% PDF	Legends
(Min, <=-6)	50	0.33%	
(-6, <=-3)	382	2.50%	
(-3, <=0)	935	6.12%	
(0, <=5)	2896	18.95%	
(5, <=10)	4323	28.29%	
(10, <=15)	3935	25.75%	
(15, <=Max)	2759	18.06%	
Total	15280	100%	

VIL

Technology	Rx Quality %
2G	95.01%
4G	96.31%

2G

RxQual_Sub		
0 to 2	(92.04%)	(11537)
2 to 3	(1.64%)	(206)
3 to 4	(0.40%)	(51)
4 to 5	(0.90%)	(114)
5 to 25	(4.99%)	(626)

Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	11537	92.07%	
(2, <=3)	206	1.64%	
(3 , <=4)	51	0.40%	
(4 , <=5)	114	0.90%	
(5 , <=Max)	626	4.99%	
Total	12534	100%	

VoLTE

ServingCellCinr		
15 to 30	(45.58%)	(6840)
10 to 15	(20.53%)	(3082)
5 to 10	(19.17%)	(2878)
0 to 5	(11.00%)	(1651)
-20 to 0	(3.69%)	(555)

Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	555	3.69%	
(0, <=5)	1651	11%	
(5, <=10)	2878	19.17%	
(10, <=15)	3082	20.56%	
(15, <=Max)	6840	45.58%	
Total	15006	100%	
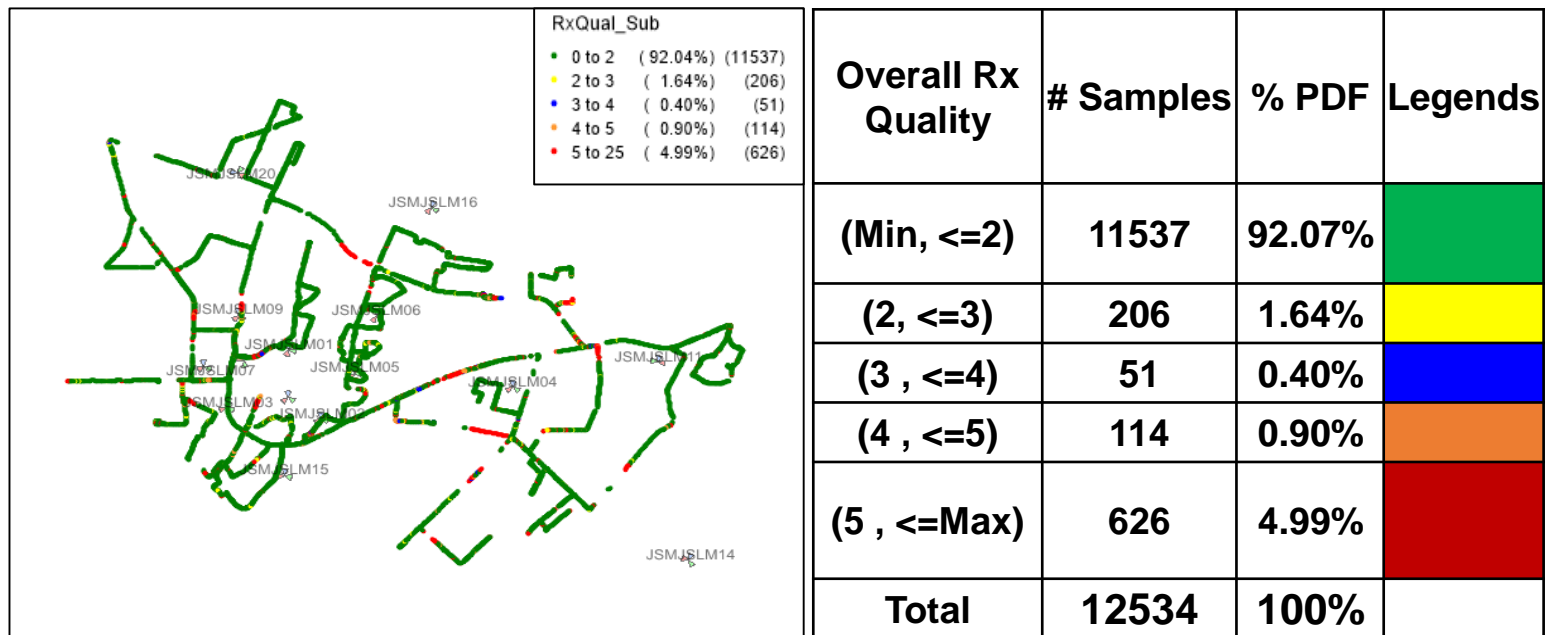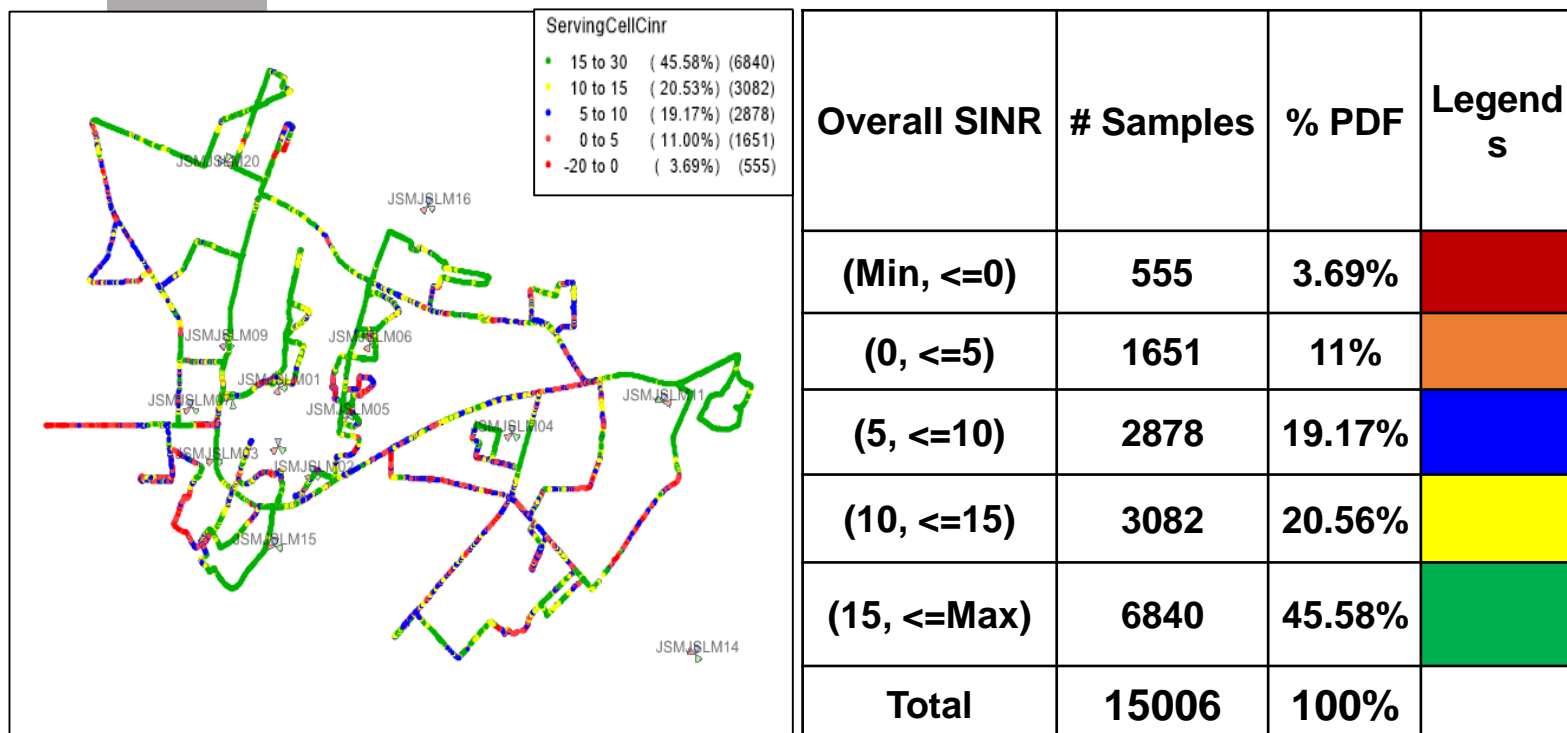
TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	**13.61%**
Airtel VoLTE	**100%**
Jio VoLTE	**100%**
VIL VoLTE	**99.92%**

Time Spent On 3G/4G