

Operator Assisted Drive Test Report

Mahbubnagar SSA

MAR - 2025

(RO, Hyderabad)

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%. All TSPs have met the Receive Quality of 95% except VIL VoLTE.

The Operator Assisted Drive Test (OADT) has been carried out by TRAI RO Hyderabad with the help of Service Providers in Mahbubnagar and surrounding areas Mahbubnagar and surrounding areas Shadnagar Balanagar Jadcherla Bijinapalle Nagarkurnool, Achampet, Dindi, Kalwakurthy, Kothakota, Pebbair and Gadwal from 9:00 AM to 8:00 PM during 17th to 20th Mar 2025. The drive test covered drive route of 665 KMs & 7 hotspot over a period of 4 days. Approximately 516 calls were made for each of the 7 networks: Three 2G networks, One 3G network and Three LTE network covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

TRAI Hyderabad conducted Operator Assisted Drive Test from 17^h to 20th March 2025 covering various locations Mahbubnagar and surrounding areas, Shadnagar Balanagar Jadcherla Bijinapalle Nagarkurnool, Achampet, Dindi, Kalwakurthy, Kothakota, Pebbair and Gadwal. The performance of Airtel, BSNL, Jio and Vodafone Idea Limited were 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 in terms of

Voice: Coverage, Quality, Handover Success Rate, Call Setup Success Rate, Drop Call Rate and Block Call Rate.

Data: Download and Upload Throughputs, Web Browsing Delay and Latency

Drive Test Details :

Voice Tests: Calls were made for 90 sec duration with wait time of 10 sec between calls in all technologies. The drive test covered a drive route of approximately 665 KMs over a period of 4 days from 17^h to 20th March 2025. Approximately 516 calls were made for each of the 7 networks: three 2G (Lock Mode) networks, one 3G (Dual mode) networks and three VoLTE network covering 4 unique TSPs.

Data Tests:

1. Dynamic data test was conducted for 665 kms over a period of 3 days for download throughput for 3G & 4G technologies.

Data Tests were performed at 6 static locations for 2G, 3G & 4G technologies of five iterations at each location.

2. For Voice and Data KPI's, 2G measurement is done with UE locked mode, 3G measurement is done with UE in Dual mode (2G & 3G) and 4G measurement is done with UE in Free Mode.

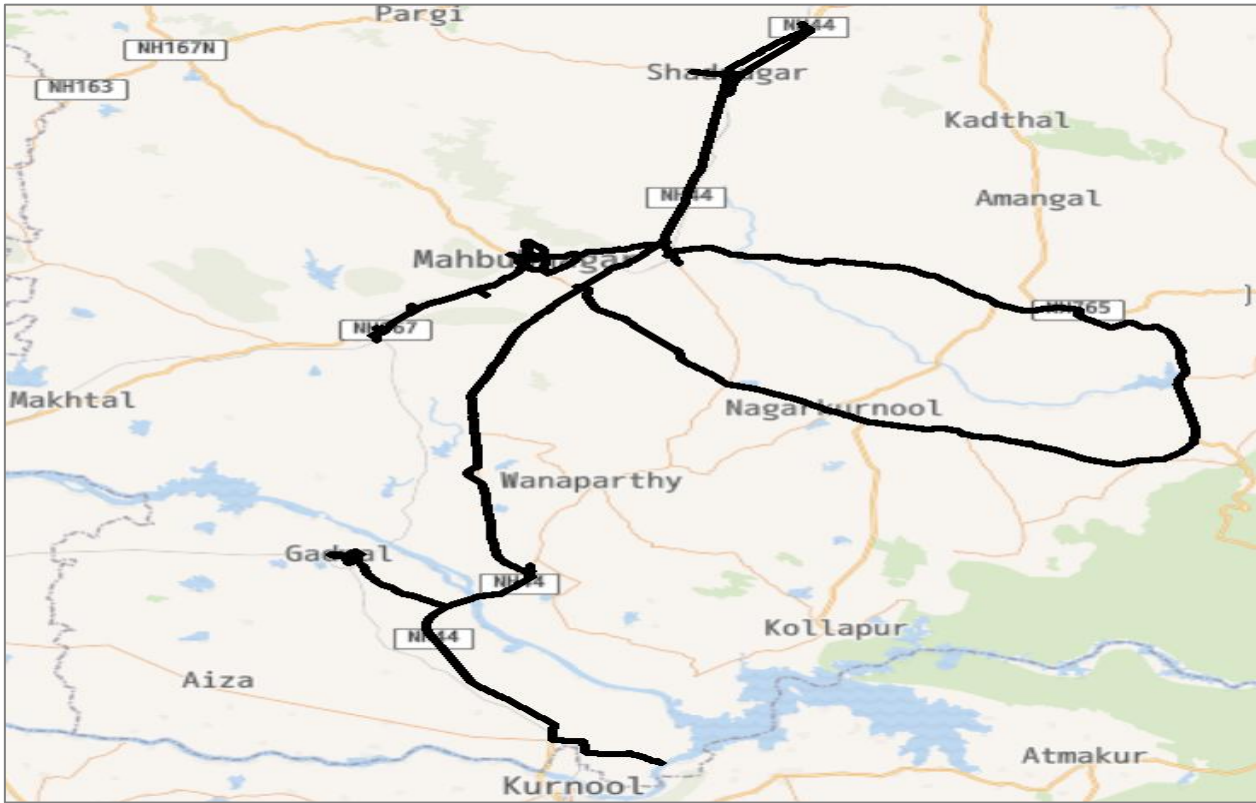
* 3G KPI's which are calculated from UE in Dual Mode (2G & 3G) includes samples and events of 2G.

* 4G KPI's which are calculated from the UE in Free Mode included samples and events of 2G & 3G.

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 www.myntra.com
Video Streaming	130 Sec Clip
Latency	32 Bytes on www.google.com

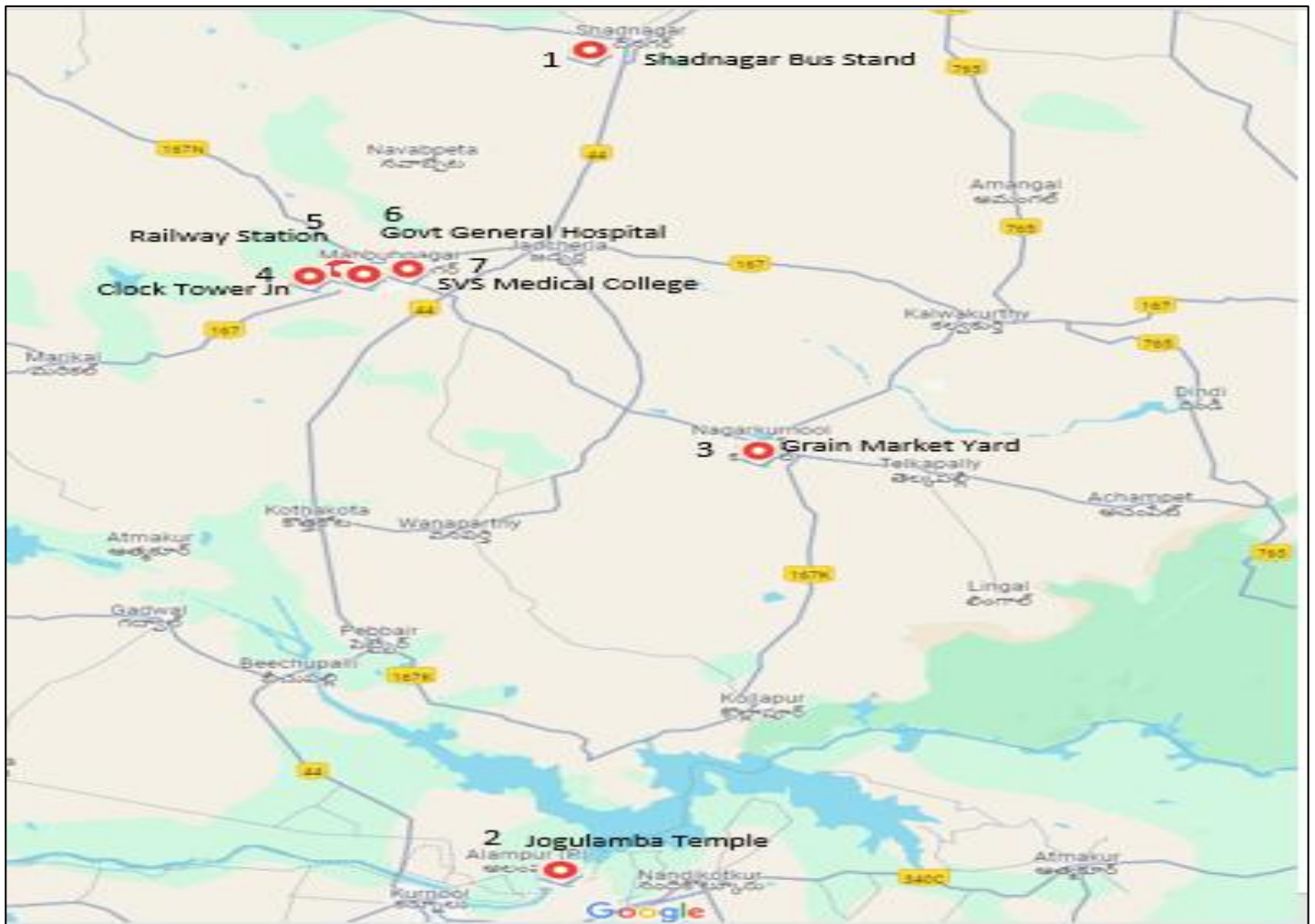
Overview

Voice & Dynamic Data Test Drive Route



Areas Covered – (Day 1)	Areas Covered – (Day 2)	Areas Covered – (Day 3)	Areas Covered – (Day 4)
Mahbubnagar	Nagarkurnool	Gadwal	Mahbubnagar
Yenugonda	Dindi	Bus stand road	MBN rly station
Jadcherla	Kalwakurthy	Shadnagar bus stand	Mahbubnagar Clock tower
Balanagar	Bus stand road	Jogulamba temple	Mahbubnagar Govt hospital
Shadnagar	Railway station road	Nagarkurnool Market yard	SVS Medical College
Bhuthpur	Wanaparthi		
Gadwal	Devarakadira		
Alampur			

Data Service Test- Static Locations



7 Static Locations

Shadnagar Bus stand

Jogulamba temple

Nagarkurnool Market yard

Mahbubnagar Clock tower

Mahbubnagar Railway station

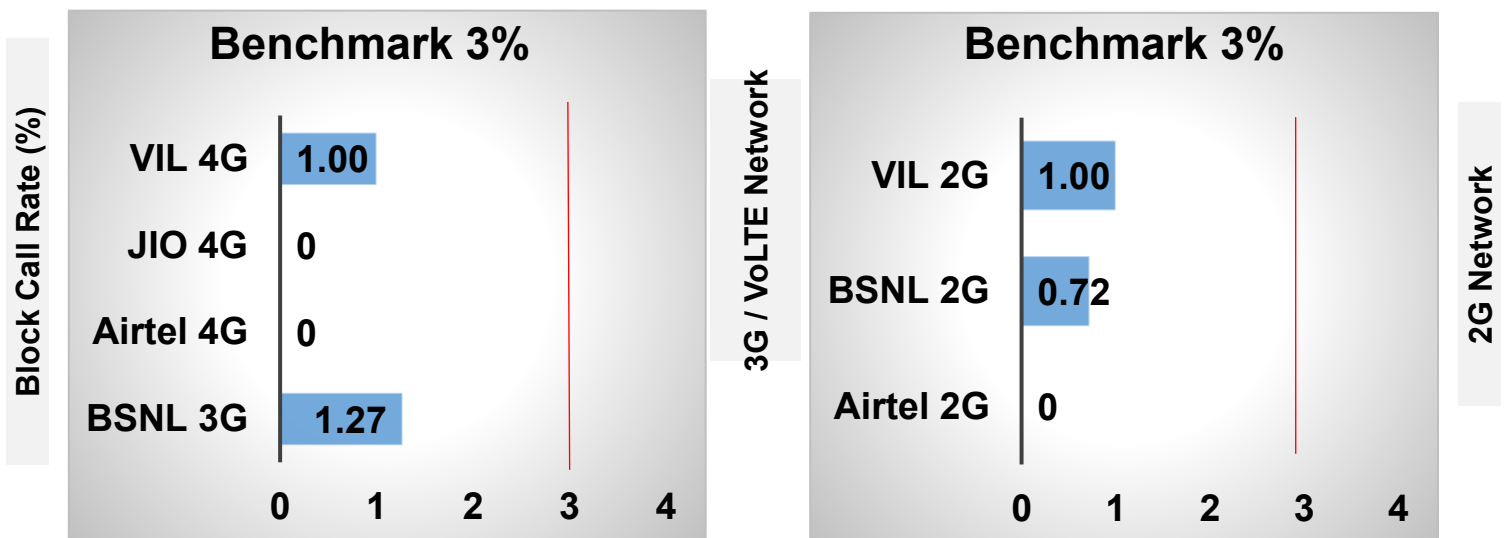
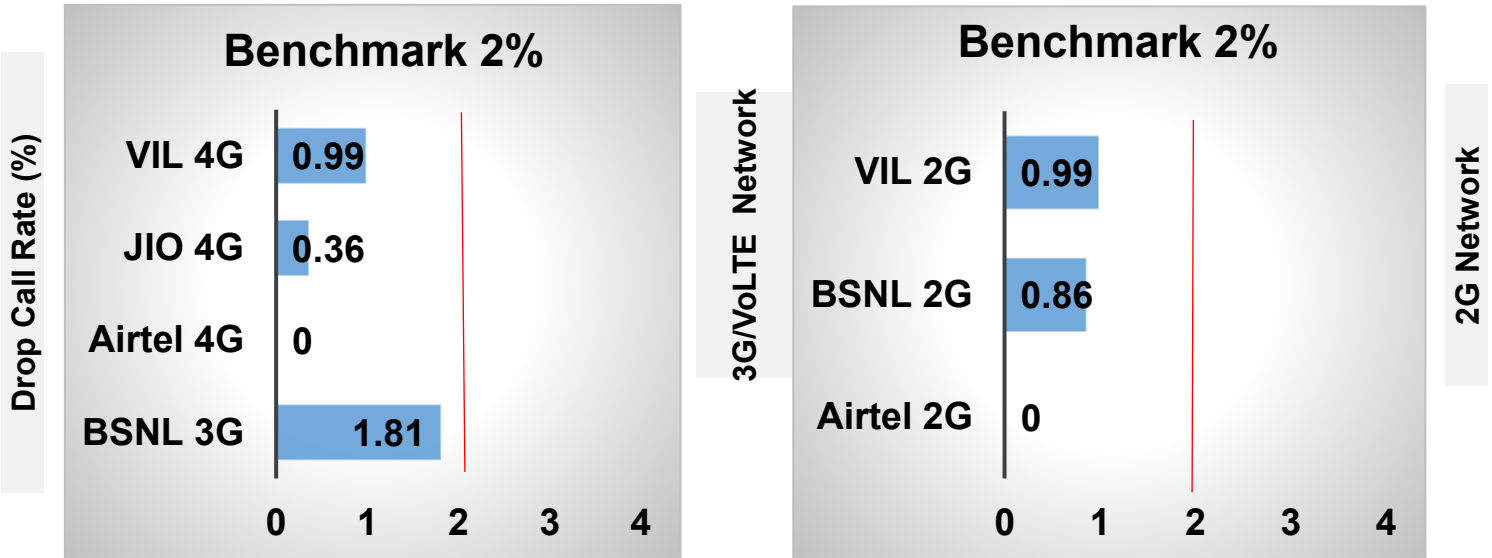
Mahbubnagar Govt hospital

SVS medical College MBNR

Voice Calls

Key Observations

QoS compliance of the TSPs in Mahabubnagar SSA for Voice across technologies 2G/3G/VoLTE:



KPIs	2G			3G	VoLTE		
	Airtel	BSNL	VIL	BSNL	Airtel	JIO	VIL
Drop Call Rate %	0	0.86	0.99	1.81	0	0.36	0.99
Block Call Rate %	0	0.72	1.00	1.27	0	0	1.00

- All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%).
- 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 %	91.20	63.30	79.91

b) Percentage of coverage samples for 3G \geq -90 dBm & LTE \geq -110 dBm

TSP	3G	VoLTE (\geq -110 dBm)		
	BSNL	Airtel	JIO	VIL
Coverage %	64.30	97.88	97.61	93.41

c) Percentage of time spent on 3G/VoLTE network

TSP	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time spent %	85.05	100	100	99.96

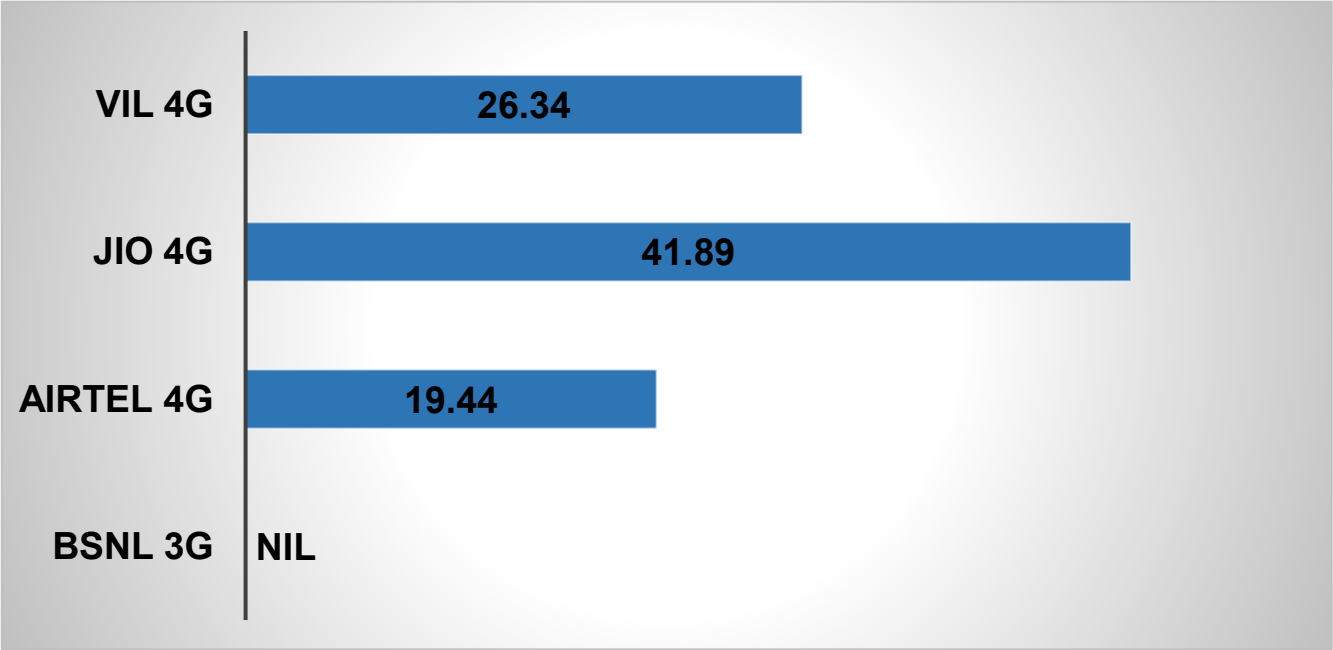
Data Services Dynamic

Key
Observations

Dynamic Data was tested, Download Throughput was tested.

Data Download Performance (kbps) - Dynamic

3G/4G/ Network:



Data Services Dynamic	3G / 4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download throughput in Mbps	NIL	19.44	41.89	26.34

* **BSNL 3G** ---Dynamic data drive couldn't be done due to Drive tool not supported dynamic data drive test

Data Services Static

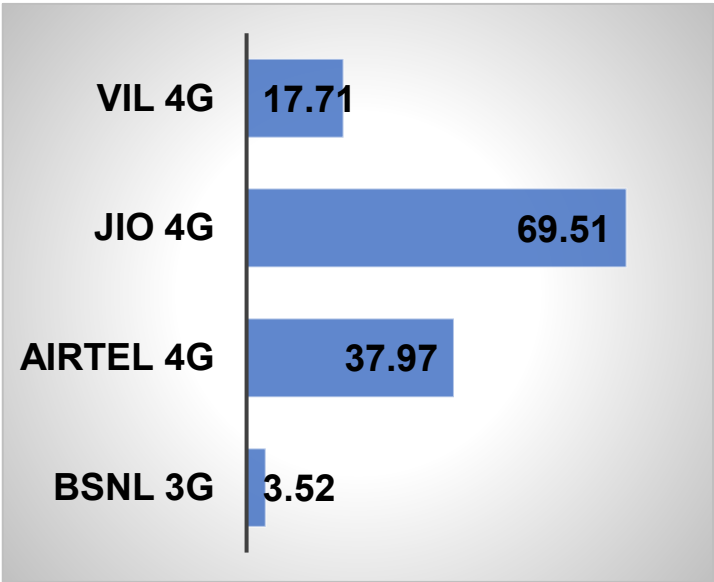
**Key Observations
(Average of 7
Hotspots)**

Data was tested at 7 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing delay (Flipkart, Amazon, Myntra).

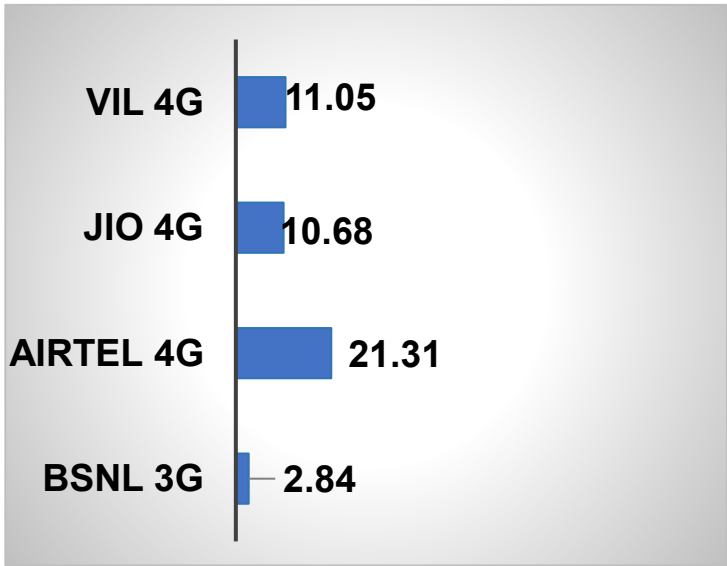
Data Download and Upload Performance (Mbps)

3G/4G/ Network:

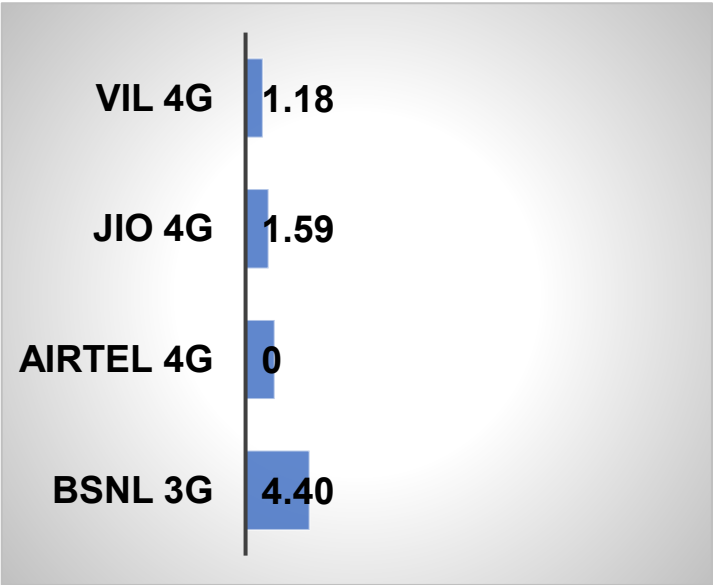
Download Throughput (Mbps)



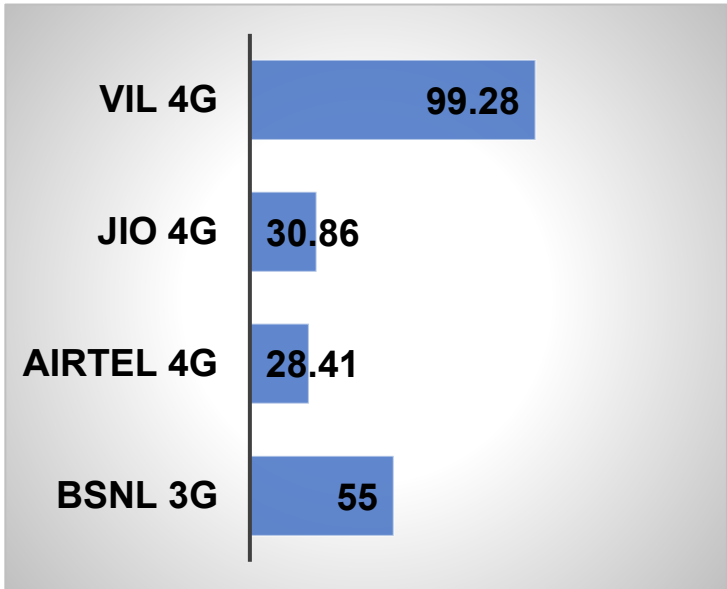
Upload Throughput (Mbps)



Web Browsing delay (Sec)



Latency (ms)



Summary

SSA Level Summary-Voice

Voice Calls	2G		
	Airtel	BSNL	VIL
Call attempts	609	693	486
Block call rate %	0	0.72	1.00
CSSR %	100	99.28	99.17
Drop call rate %	0	0.86	0.99
Mobility HOSR %	98.26	95.65	96.34
RX Quality %	95.10	96.00	95.01

Voice Calls	3G	VoLTE		
TSP (For 3G)	BSNL	Airtel	JIO	VIL
Call attempts	333	642	554	492
Block call rate %	1.27	0	0	1.0
CSSR %	98.20	100	100	97.09
Drop call rate %	1.81	0	0.36	0.99
Mobility HOSR %	94.12	100	98.22	97.77
RX Quality %	95.10	95.30	96.08	84.75

Summary

SSA Level Summary- (Average of 7 hotspots)- Data Services

Data Services Static	3G/4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download throughput in Mbps	3.52	37.97	69.51	17.71
Upload Throughput in Mbps	2.84	21.31	10.68	11.05
Video streaming delay in sec	0	0	0.81	1.13
Web browsing delay in second	4.40	2.00	1.59	1.18
Latency in (msec)	55	28.41	30.86	99.28

Shadnagar Bus stand	2G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	0.19	35.66	73.62	17.77
Upload Throughput (Mbps)	0.11	12.1	6.70	3.70
Web Browsing Delay (sec)	6.05	0.95	1.80	2.10
Latency (msec)	295.8	30.8	28.34	100

Jogulamba Temple	3G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	3.52	56.56	29.32	19.76
Upload Throughput (Mbps)	0.88	37.02	7.56	12.97
Web Browsing Delay (sec)	4.4	1.8	1.49	1.80
Latency (msec)	55	26	34.17	102

Nagarkurnool Market Yard	2G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	0.19	33.07	81.78	19.07
Upload Throughput (Mbps)	0.08	24.74	10.12	17.62
Web Browsing Delay (sec)	29	2.5	1.76	2.00
Latency (msec)	257	25	23	95

Mahbubnagar Clock Tower	2G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	1.67	35.94	51.59	11.71
Upload Throughput (Mbps)	0.07	17.82	22.93	8.93
Web Browsing Delay (sec)	30.7	1.9	1.37	1.70
Latency (msec)	351.5	24.9	35.85	101

Mahbubnagar Railway Station	2G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	0.16	40.56	94.46	22.59
Upload Throughput (Mbps)	0.07	22.32	10.36	9.41
Web Browsing Delay (sec)	33	2.7	1.50	1.90
Latency (msec)	467	31.4	24.87	105

Mahbubnagar Govt Hospital	2G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	0.20	24.36	73.18	13.21
Upload Throughput (Mbps)	0.10	18.44	6.43	10.50
Web Browsing Delay (sec)	32	1.9	1.81	1.80
Latency (msec)	295	35.4	28.34	88

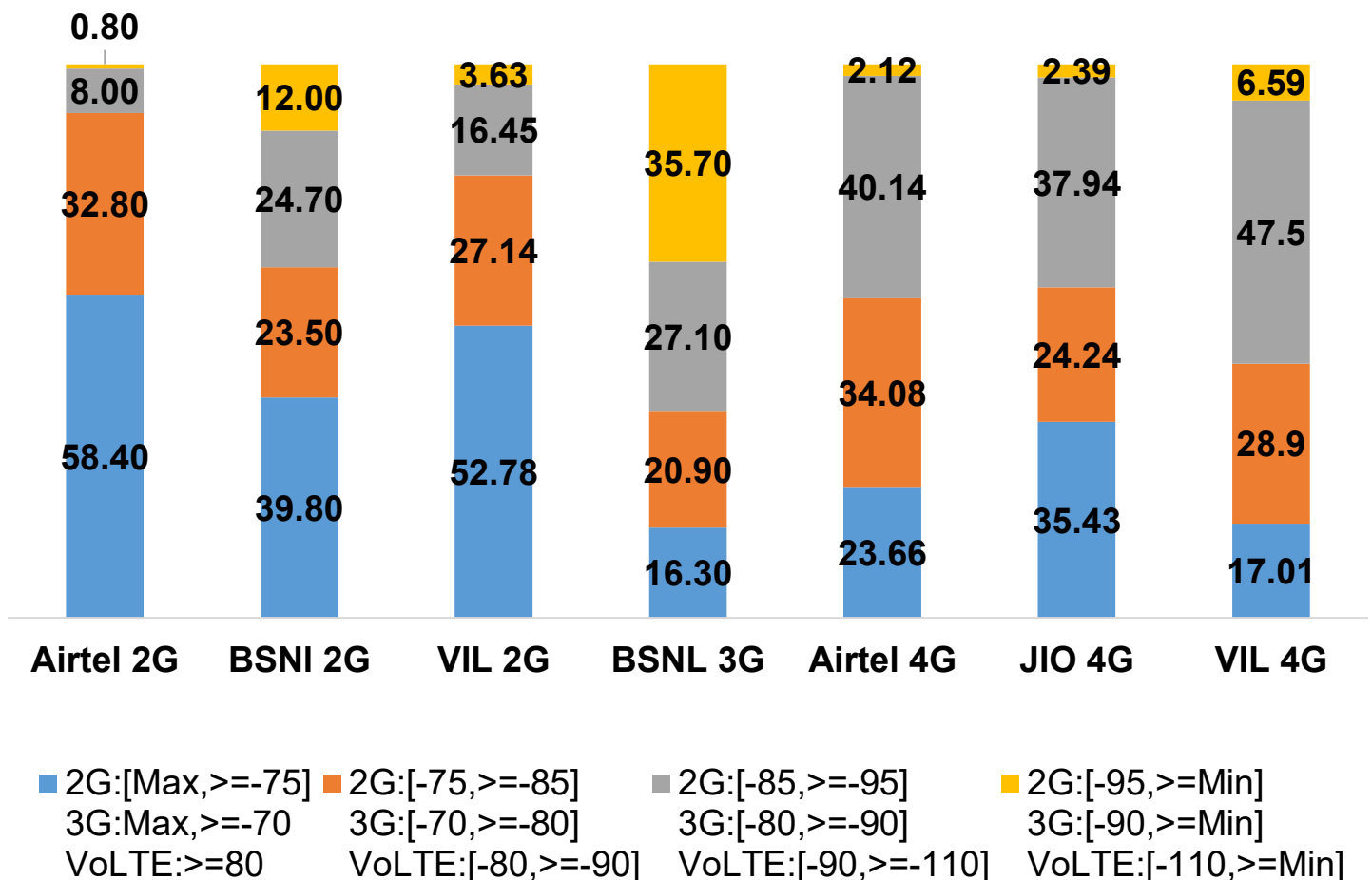
SVS Medical College MBNR	2G	LTE		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	0.13	39.70	82.60	19.88
Upload Throughput (Mbps)	0.09	16.74	10.68	14.23
Web Browsing Delay (sec)	52	2.3	1.40	1.50
Latency (msec)	251	25.4	41.50	104

I. 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 ≥ -85 dBm, RSCP is ≥ -90 dBm & RSRP ≥ -110 dBm. The details are as follows.

TSP	Coverage Rate %
Airtel 2G	91.20
BSNL 2G	63.30
VIL 2G	79.91
BSNL 3G	64.30
Airtel VoLTE	97.88
JIO VoLTE	97.61
VIL VoLTE	93.41

Coverage Details

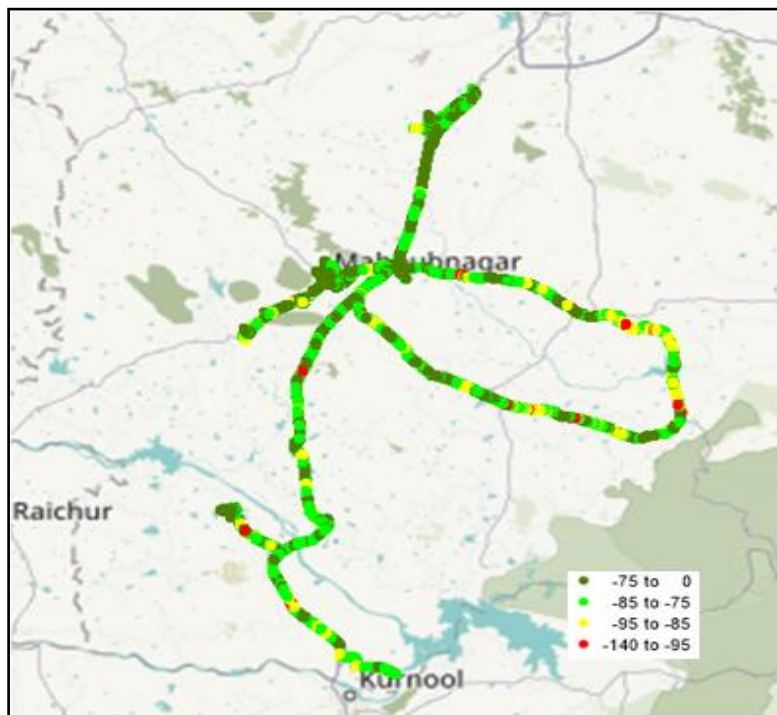


I. Coverage Details

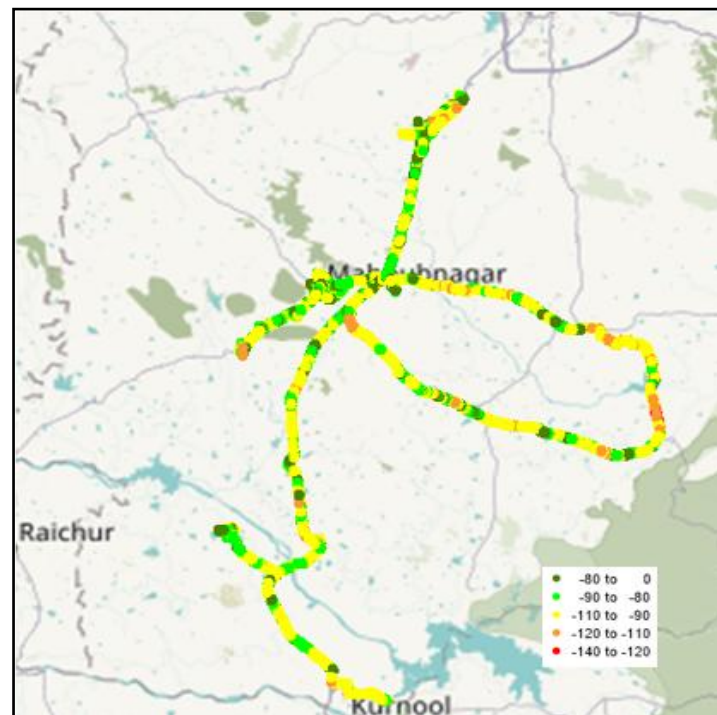
AIRTEL

Technology	99.2	Coverage Rate %
2G		91.20
VoLTE		97.88

2G



VoLTE



2G

Overall RxLevel	# Samples	%
[Max, >=-75]	2691189	58.40
[-75, >=-85]	1513163	32.80
[-85, >=-95]	352716	8.00
[-95, >=Min]	52041	0.80
Total	4609109	100

VoLTE

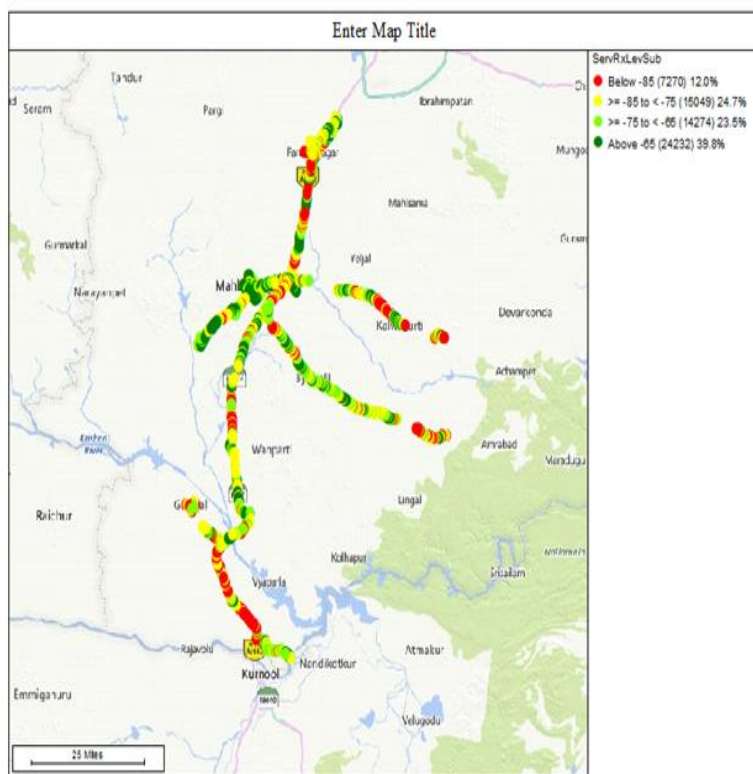
Overall RSRP	# Samples	%
[Max, >=-80]	1997616	23.66
[-80, >=-90]	2877735	34.08
[-90, >=-110]	3389702	40.14
[-110, >=-120]	166633	1.97
[-120, >=Min]	12096	0.15
Total	8443782	100

I. Coverage Details

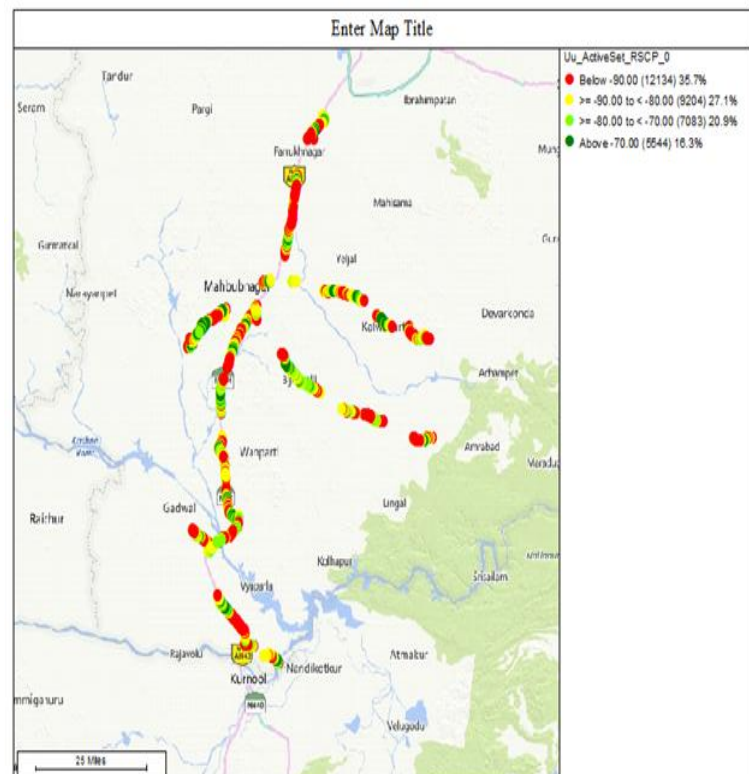
BSNL

Technology	Coverage Rate %
2G	63.30
3G	64.30

2G



3G



2G

Overall RxLevel	# Samples	%
[Max, >=-75]	24232	39.80
[-75, >=-85]	14274	23.50
[-85, >=-95]	15049	24.70
[-95, >=Min]	7270	12.00
Total	60825	100

3G

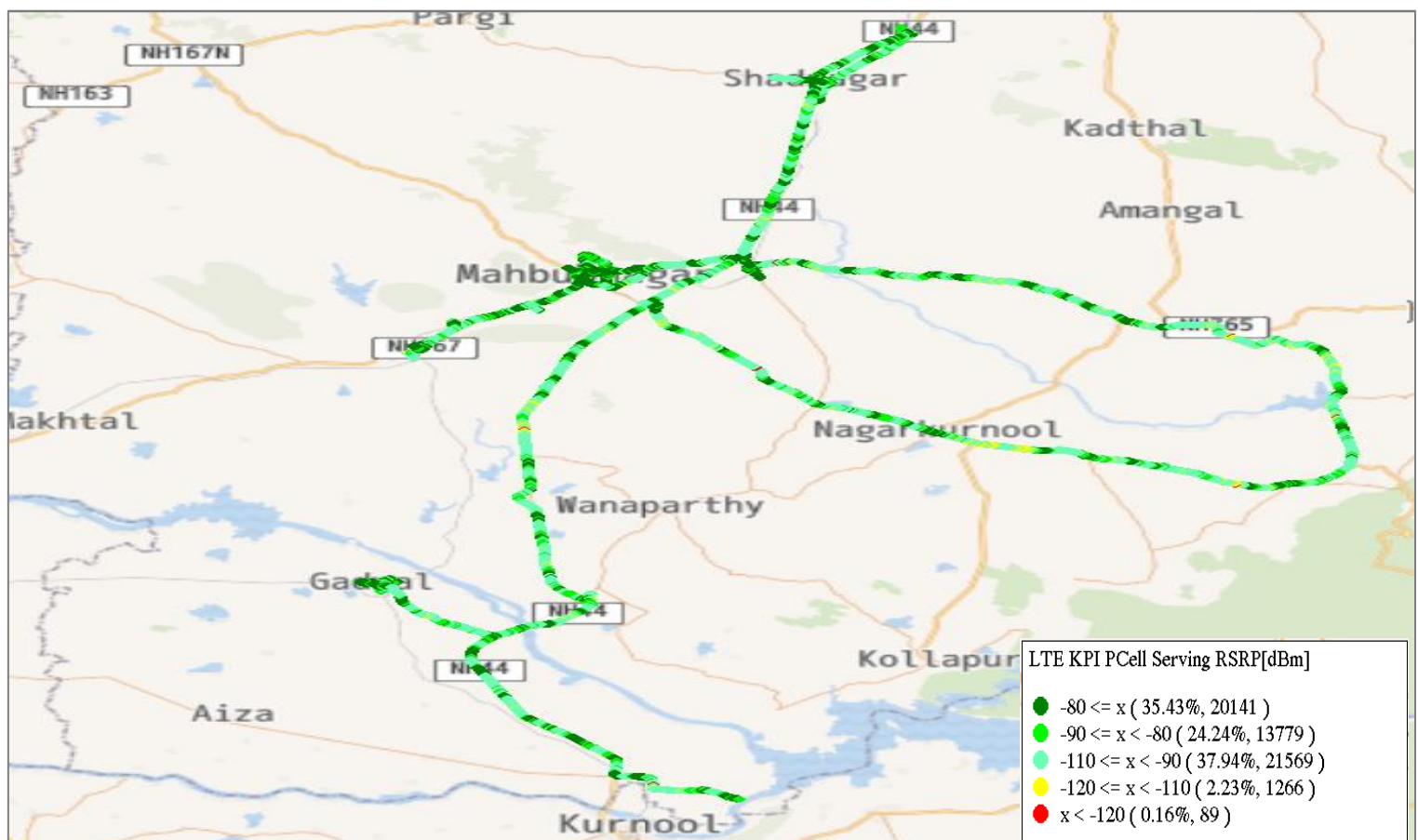
Overall RSRP	# Samples	%
[Max, >=-70]	5544	16.30
[-70, >=-80]	7083	20.90
[-80, >=-90]	9204	27.10
[-90, >=Min]	12134	35.70
Total	33965	100

I. Coverage Details

JIO

Technology	Coverage Rate %
VoLTE	97.61

VoLTE



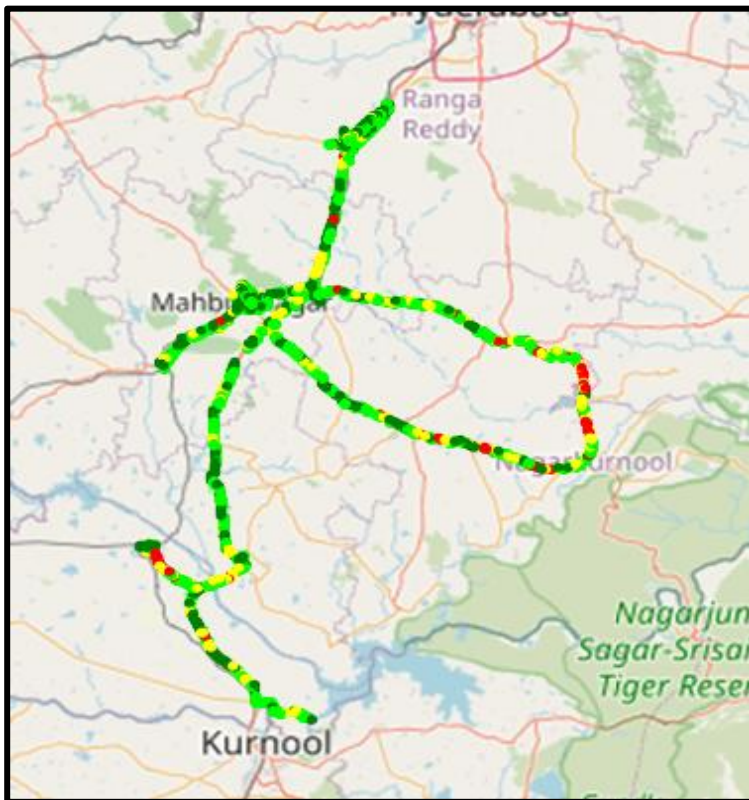
VoLTE		
Overall RSRP	# Samples	%
[Max, >=-80]	20141	35.43
[-80, >=-90]	13779	24.24
[-90, >=-110]	21569	37.94
[-110, >=-120]	1266	2.23
[-120, >=Min]	89	0.16
Total	56844	100

I. Coverage Details

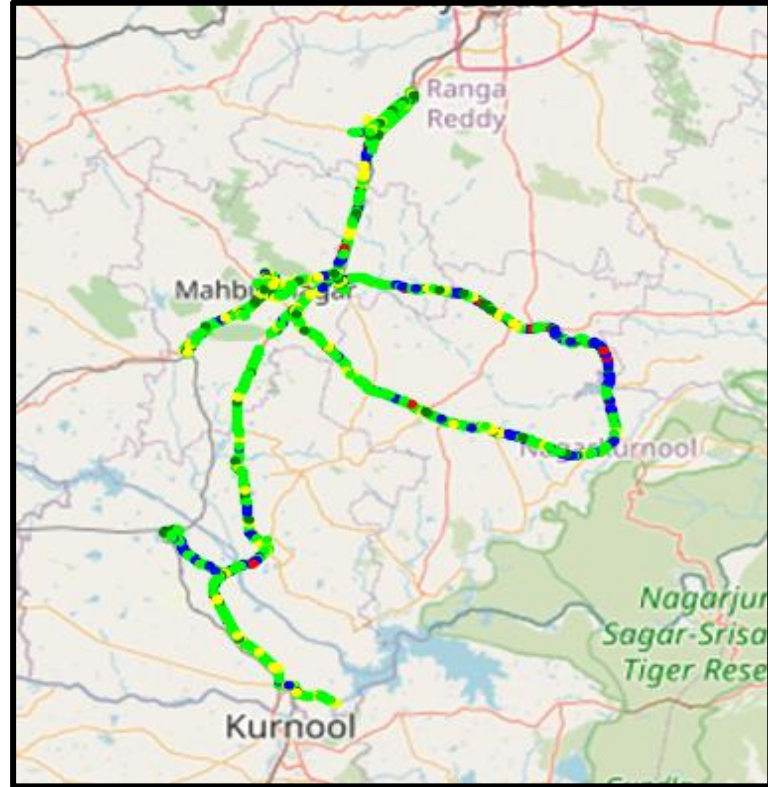
VIL

Technology	Coverage Rate %
2G	79.91
VoLTE	93.41

2G



VoLTE



2G

Overall RxLevel	# Samples	%
[Max, >=-75]	2346618	52.78
[-75, >=-85]	1206670	27.14
[-85, >=-95]	731273	16.45
[-95, >=Min]	161782	3.63
Total	4446343	100

VoLTE

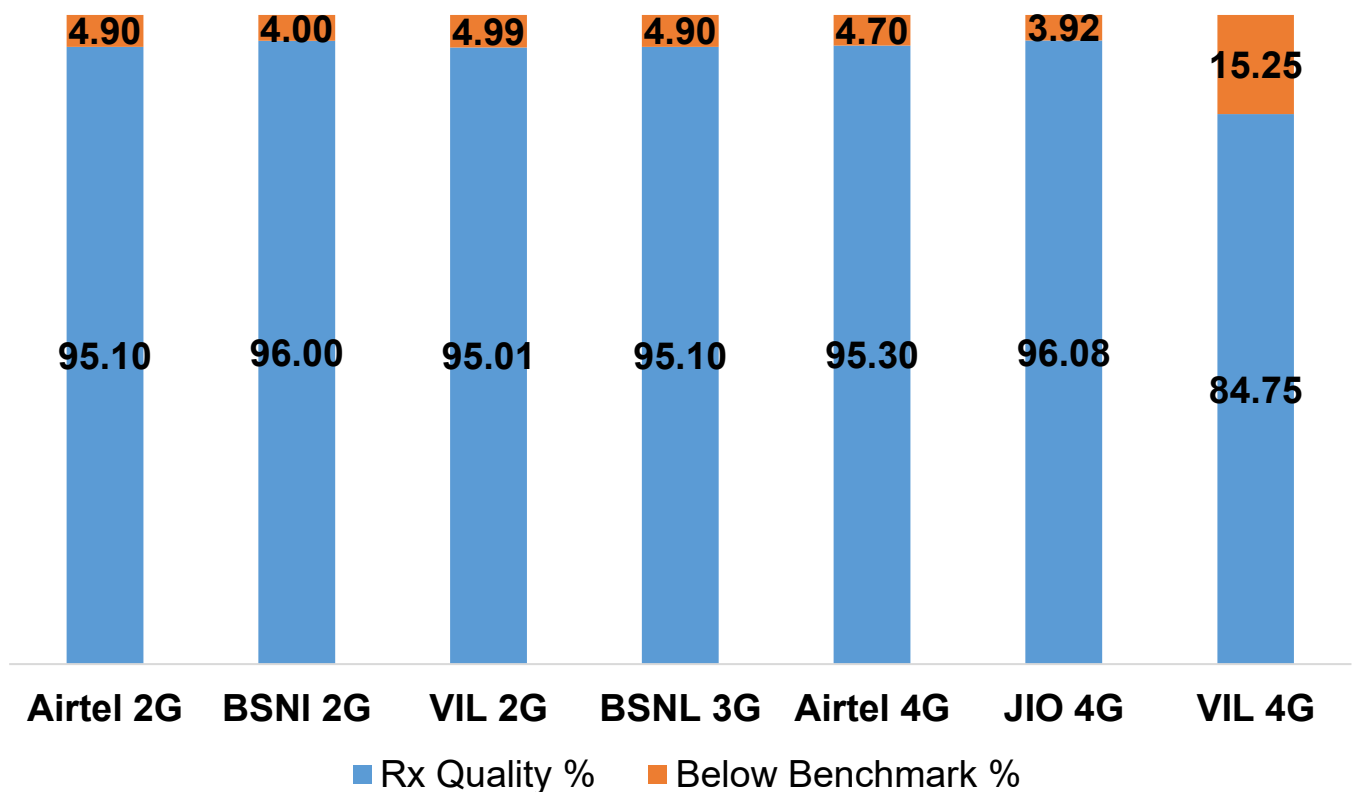
Overall RSRP	# Samples	%
[Max, >=-80]	2223249	17.01
[-80, >=-90]	3777655	28.90
[-90, >=-110]	6209272	47.50
[-110, >=-120]	802563	6.13
[-120, >=Min]	59594	0.46
Total	13072333	100

II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Qual ≤ 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 $\geq 95\%$.

TSP	Rx Quality %
Airtel 2G	95.10
BSNL 2G	96.00
VIL 2G	95.01
BSNL 3G	95.10
Airtel 4G	95.30
JIO 4G	96.08
VIL 4G	84.75

RX Quality Distribution

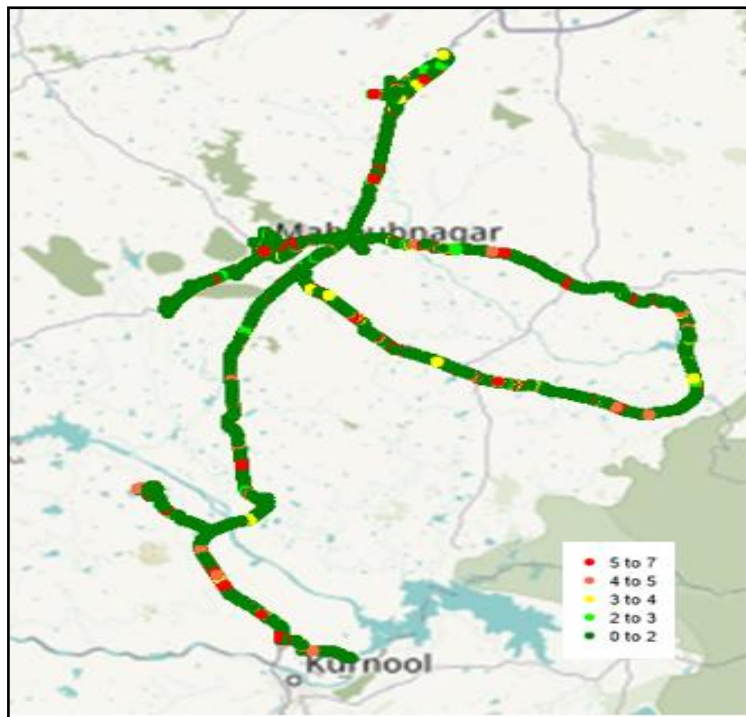


II. Quality Details

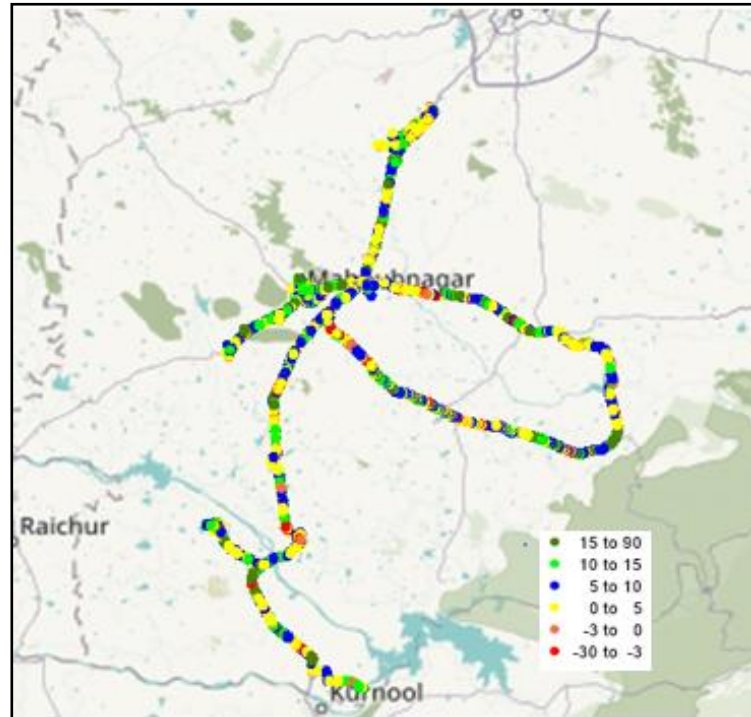
Airtel

Technology	Rx Quality %
2G	95.10
VoLTE	95.30

2G



VoLTE



Overall Rx Quality	# Samples	%
(Min, <=2)	3881842	82.00
(2, <=3)	381472	8.10
(3, <=4)	94143	2.00
(4, <=5)	146369	3.00
(5, <=Max)	231902	4.90
Total	4735728	100

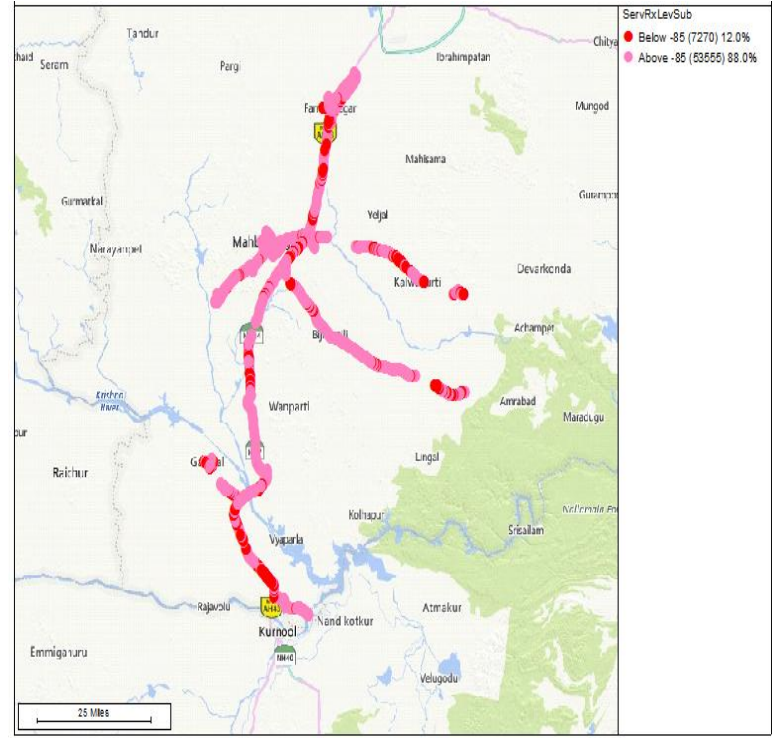
Overall SINR	# Samples	%
(Min, <=-3)	272783	3.10
(-3, <=0)	136947	1.60
(0, <=5)	2829012	32.50
(5, <=10)	2817902	32.50
(10, <=15)	1550743	17.90
(15, <=Max)	1072458	12.40
Total	8679845	100

II. Quality Details

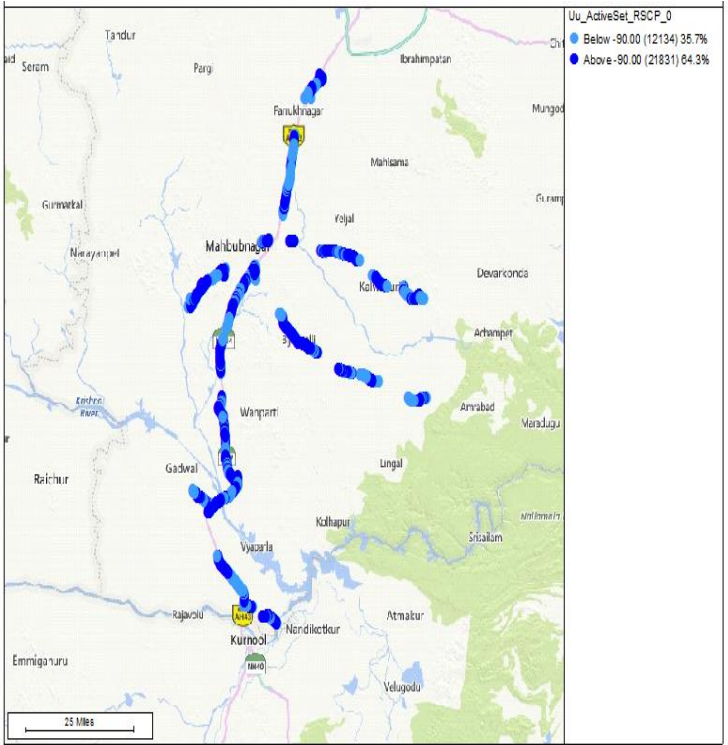
BSNL

Technology	Rx Quality %
2G	96.00
3G	95.10

2G



3G



2G		
Overall RxQuality	# Samples	%
Below 2	47303	77.80
[>=2, <3]	2841	4.70
[>=3, <4]	2775	4.60
[>=4, <6]	5469	9.00
Above 6	2437	4.00
Total	60825	

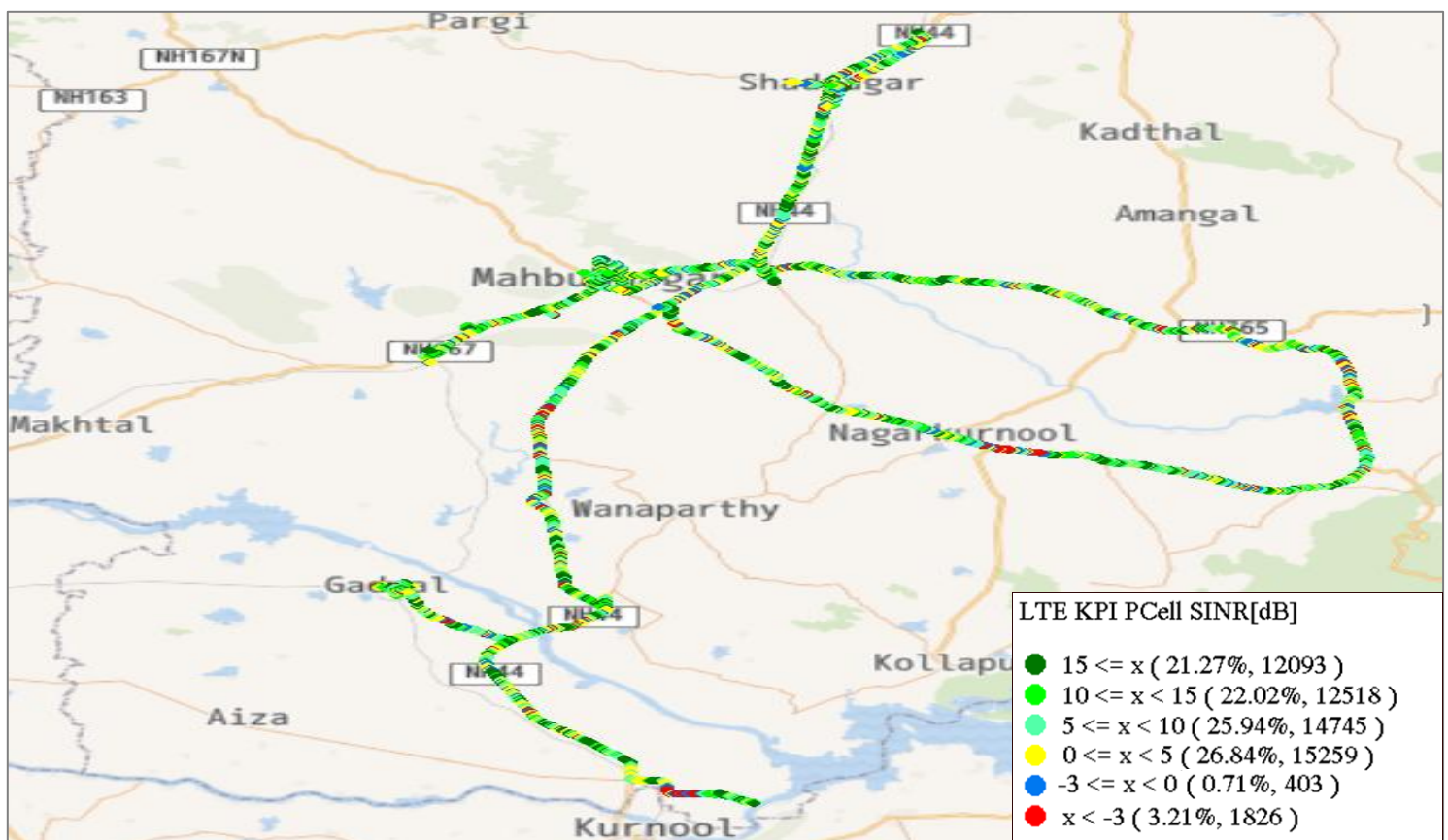
Overall SIN	# Samples	%
(Max, <=-14)	1654	4.90
(-14, <= Min)	32311	95.10
Total	33965	100

II. Quality Details

JIO

Technology	Rx Quality %
VoLTE	96.08

VoLTE



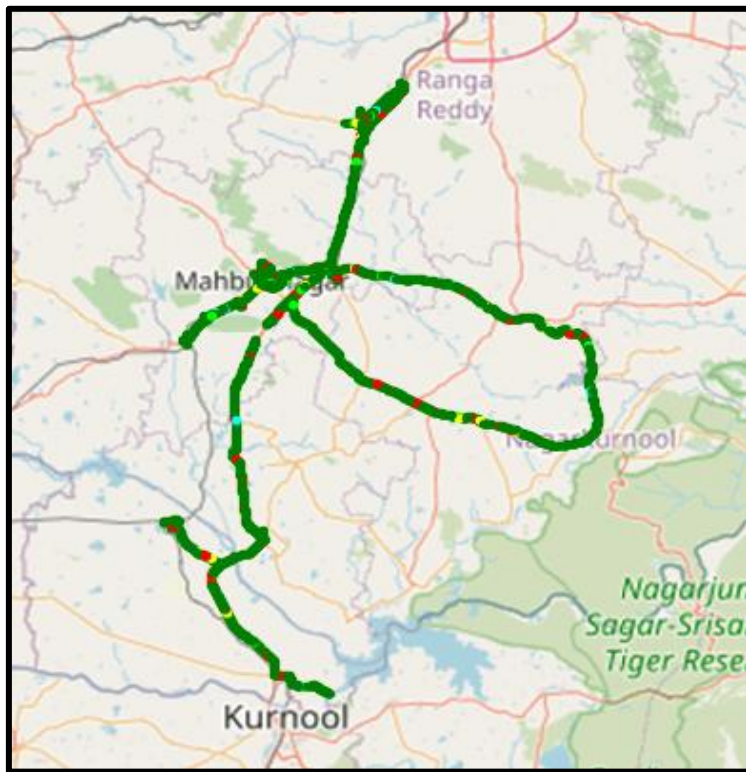
Overall SINR	# Samples	%
(Min, <=-3)	1826	3.21
(-3, <=0)	403	0.71
(0, <=5)	15259	26.84
(5, <=10)	14745	25.94
(10, <=15)	12518	22.03
(15, <=Max)	12093	21.27
Total	56844	100

II. Quality Details

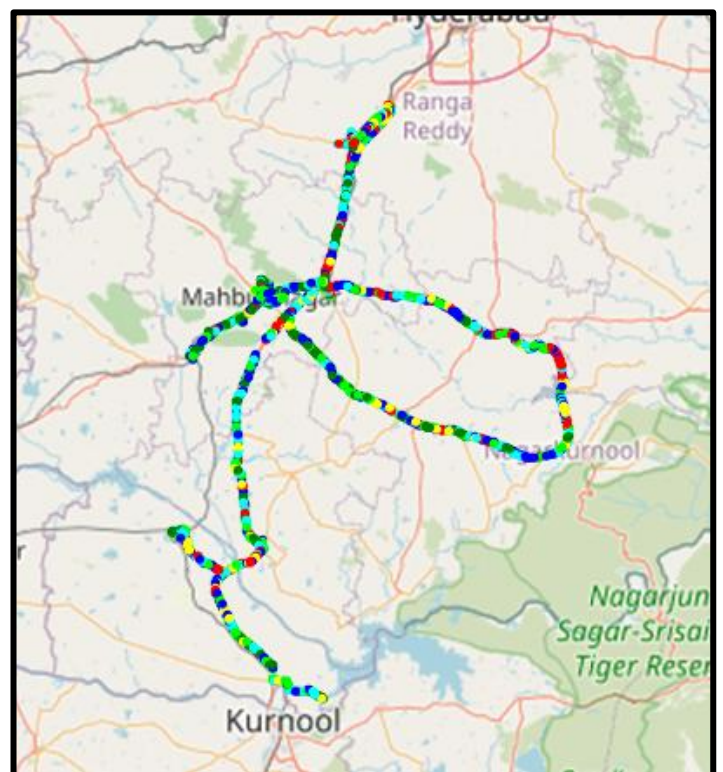
VIL

Technology	Rx Quality %
2G	95.01
VoLTE	84.75

2G



VoLTE

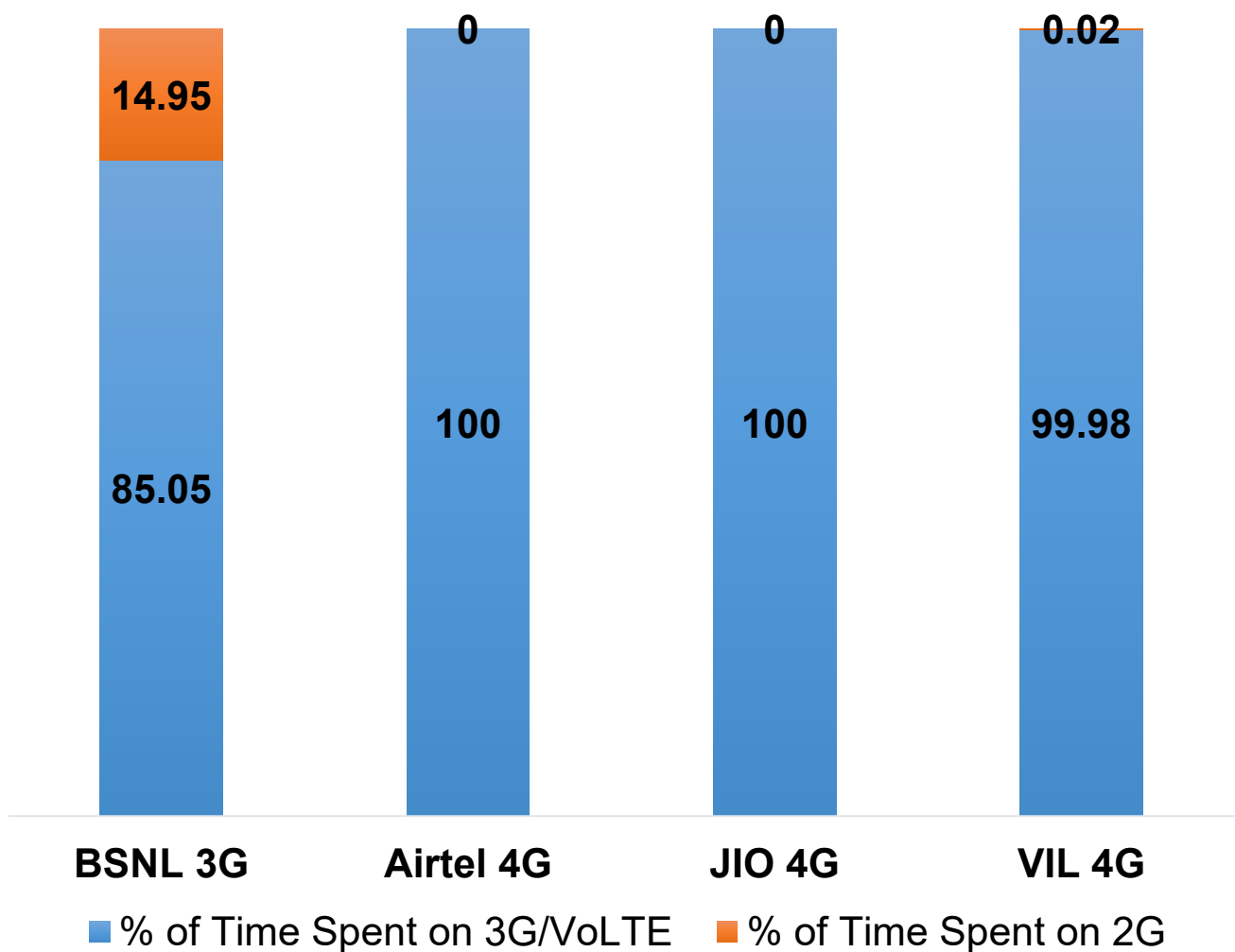


Overall Rx Quality	# Samples	%
(Min, <=2)	3936961	88.54
(2, <=3)	142963	3.21
(3 , <=4)	69533	1.56
(4 , <=5)	75404	1.70
(5 , <=Max)	221482	4.99
Total	4446343	100

Overall SINR	# Samples	%
(Min, <=-3)	562578	4.31
(-3, <=0)	1429807	10.94
(0, <=5)	2740816	20.97
(5, <=10)	3221336	24.64
(10, <=15)	2685619	20.54
(15, <=Max)	2432177	18.60
Total	13072333	100

III. Technology Details

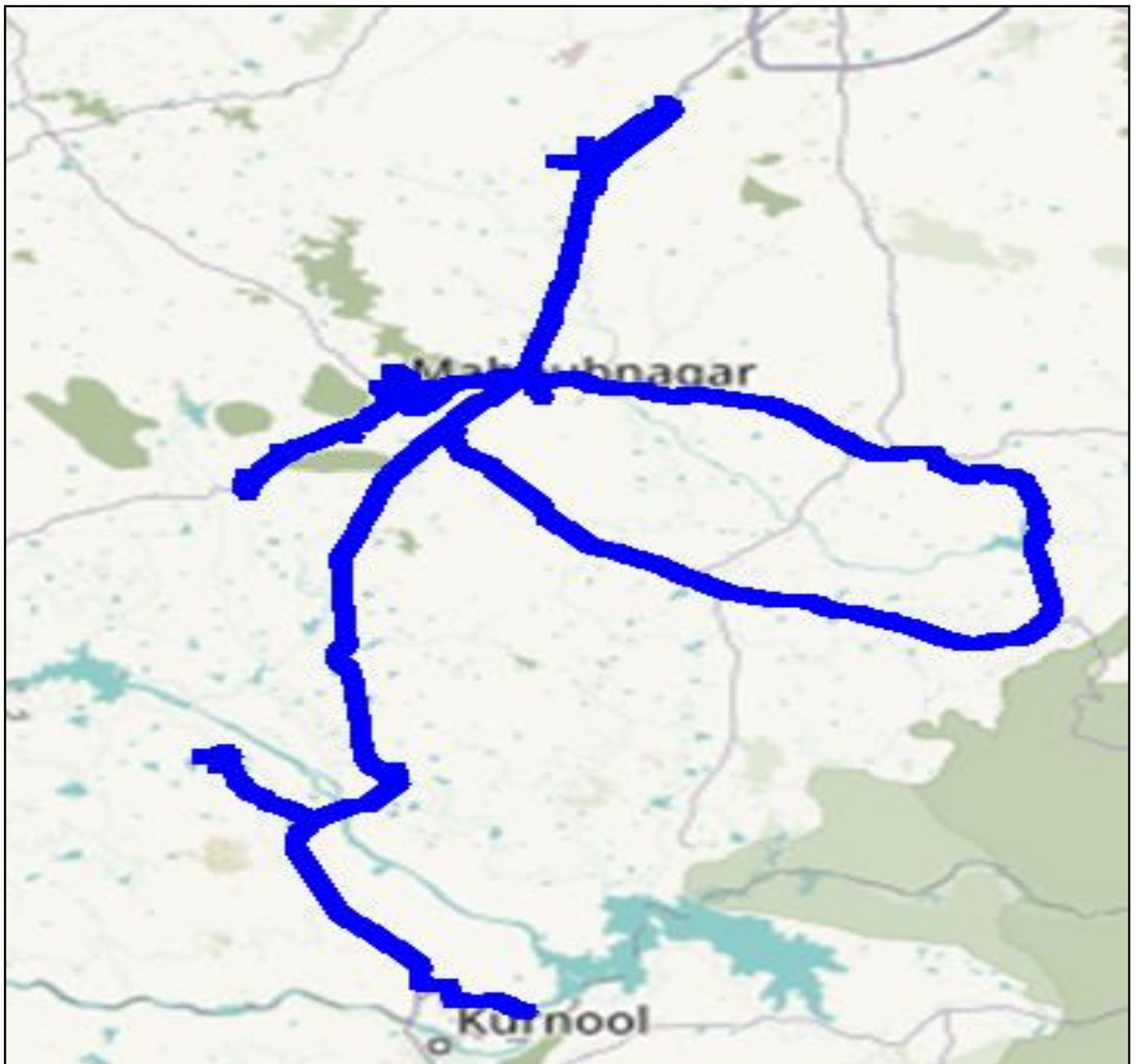
TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	85.05
Airtel VoLTE	100
JIO VoLTE	100
VIL VoLTE	99.96



III. Technology Details

Airtel

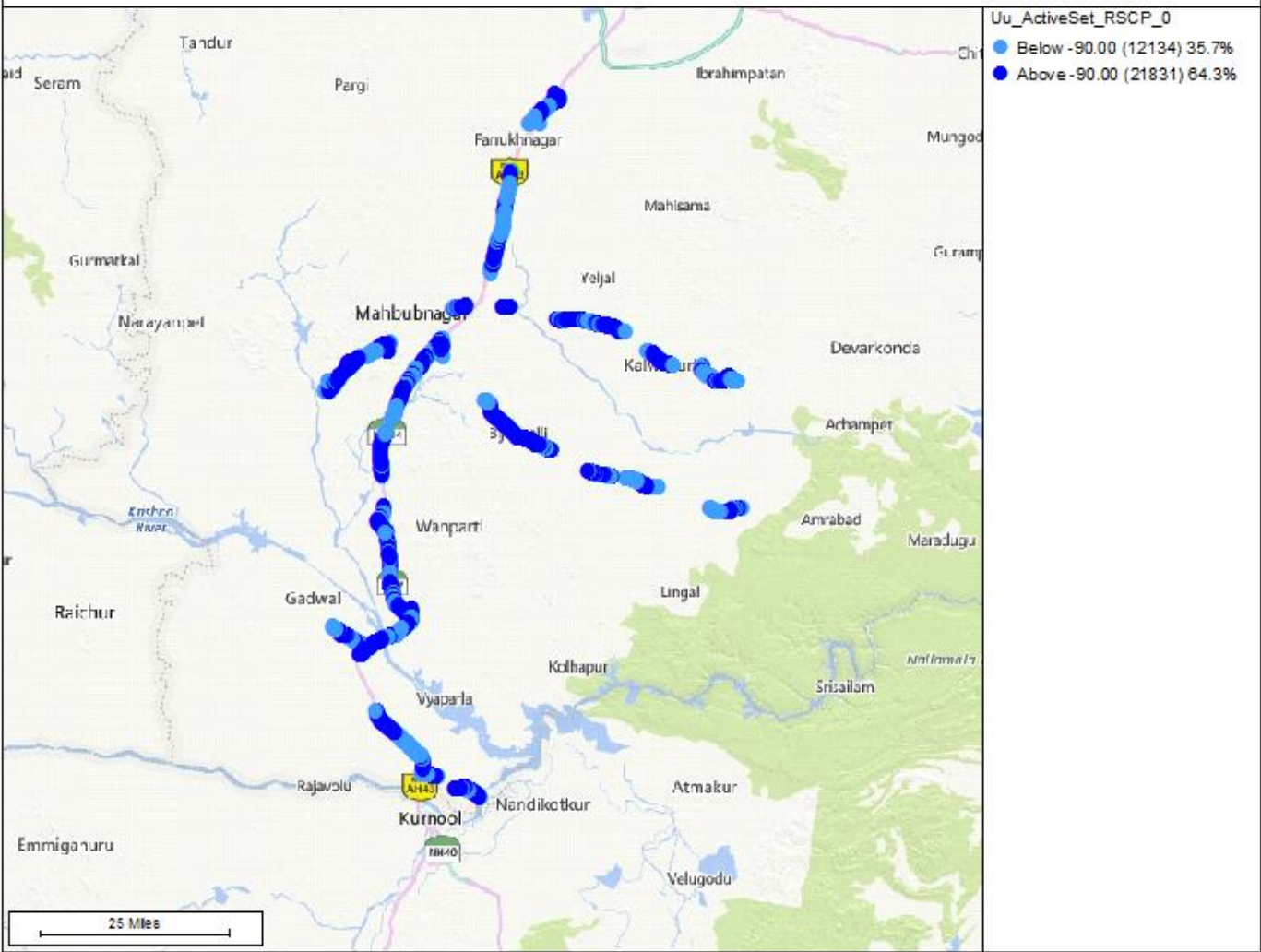
Technology	Time Spent %
3G / VoLTE	100



III. Technology Details

BSNL

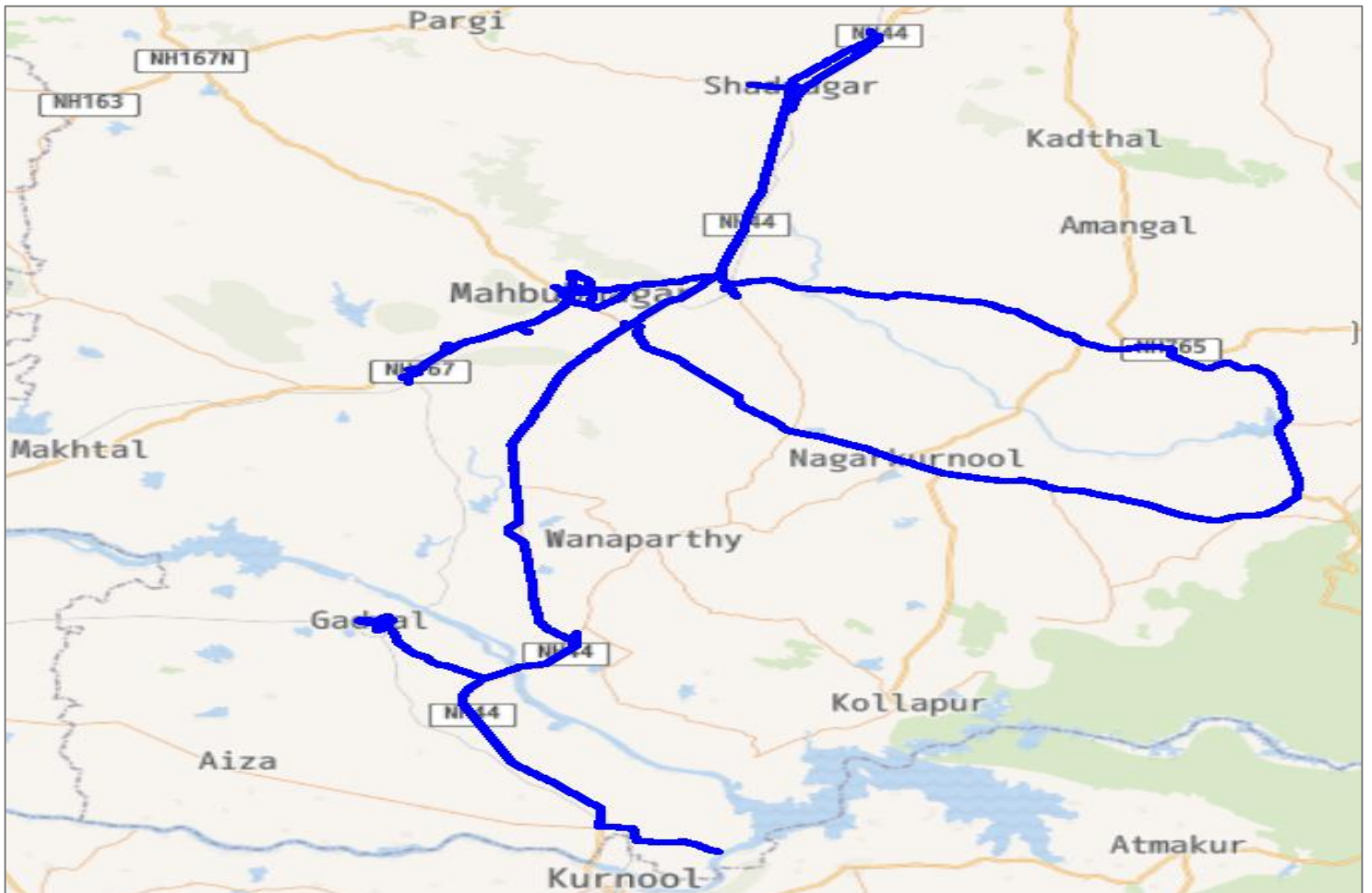
Technology	Time Spent on 3G
3G	85.05



III. Technology Details

JIO

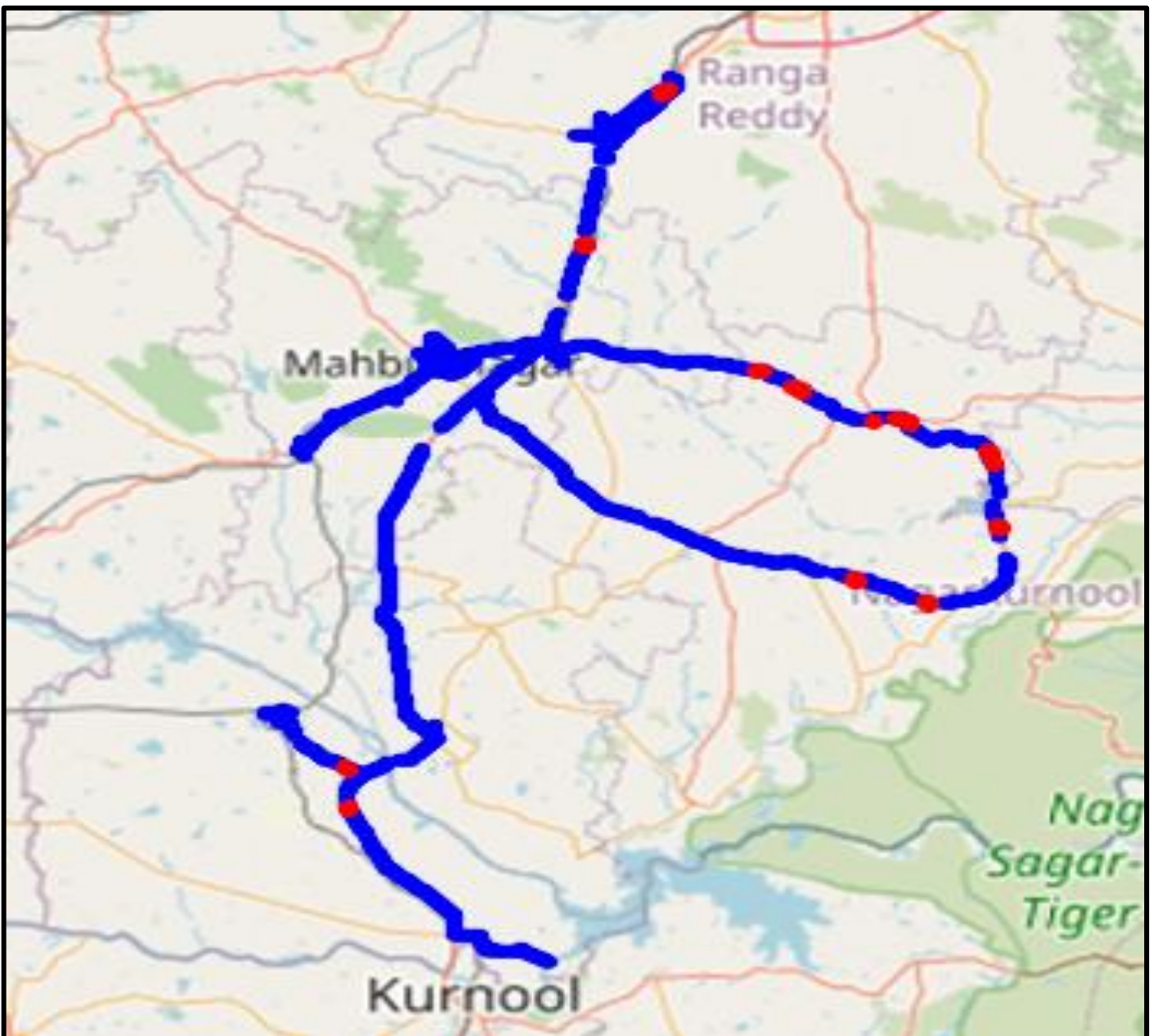
Technology	Time Spent %
3G / VoLTE	100



III. Technology Details

VIL

Technology	Time Spent %
3G / VoLTE	99.96

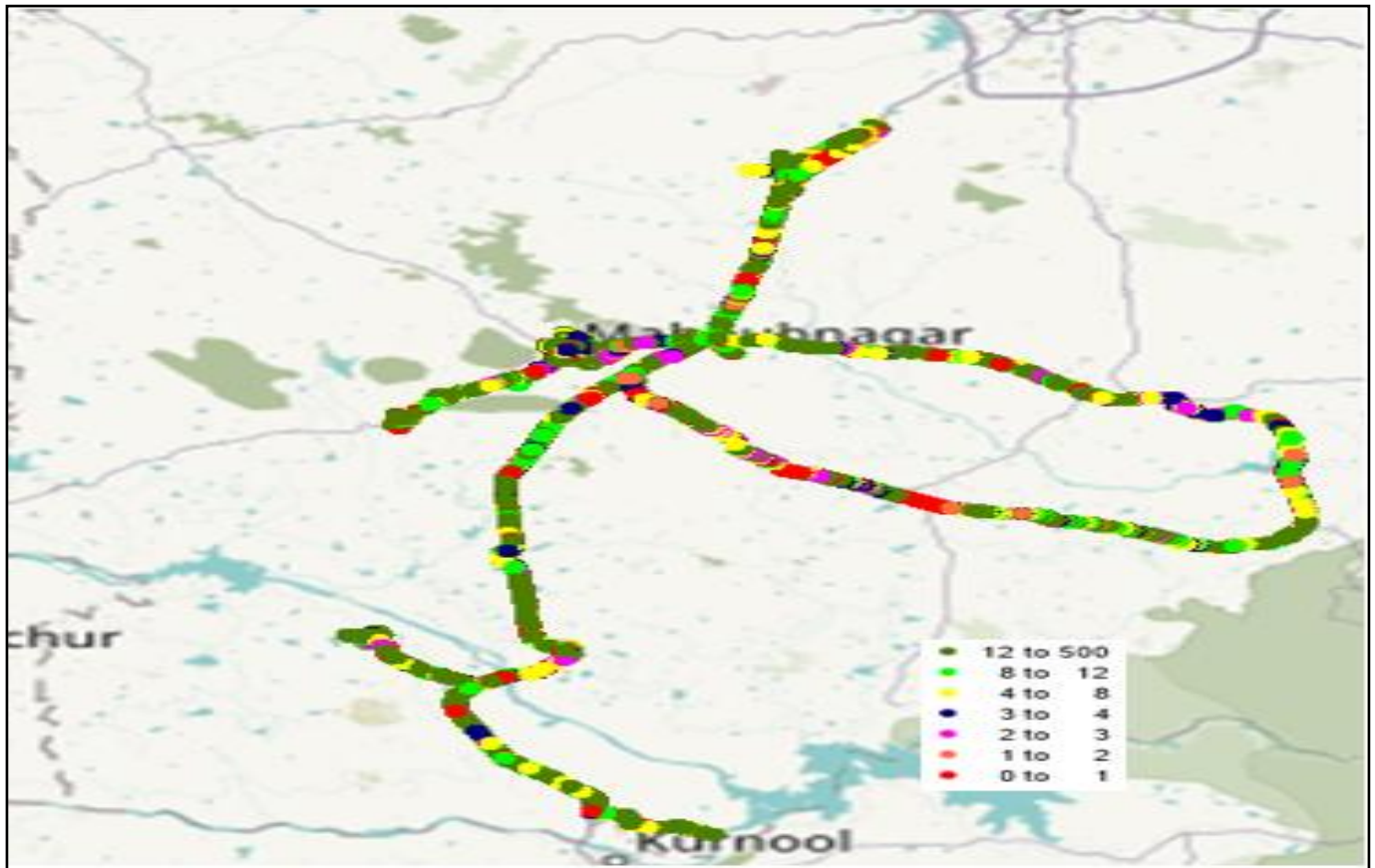


IV. Dynamic Data Test- 3G / 4G DL Details

Airtel

Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	4G
Download Throughput (Mbps)	19.44



DL throughput	No of Sample	%
0 to 1 Mbps	886906	5.80
1 to 2 Mbps	498813	3.30
2 to 3 Mbps	491656	3.20
3 to 4 Mbps	498865	3.30
4 to 8 Mbps	1930852	12.70
8 to 12 Mbps	1710355	11.20
>12 Mbps	9214954	60.50
Total	15232401	100

IV. Dynamic Data Test-
3G DL Details

BSNL

Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	3G
Download Throughput (Mbps)	NIL

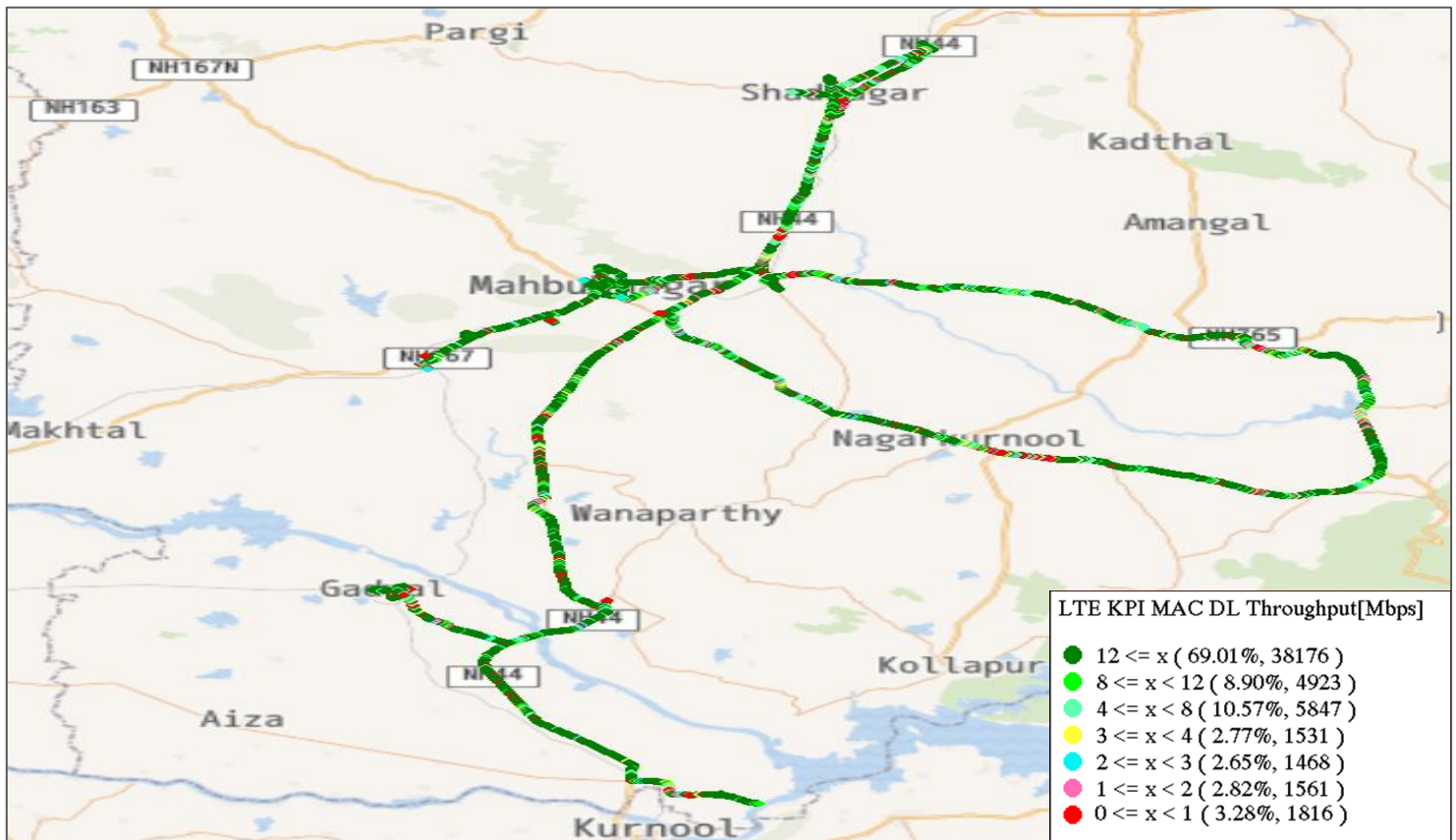
Dynamic data drive couldn't be done due to Drive tool not supported dynamic data drive test

IV. Dynamic Data Test- 3G / 4G DL Details

JIO

Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	4G
Download Throughput (Mbps)	41.89



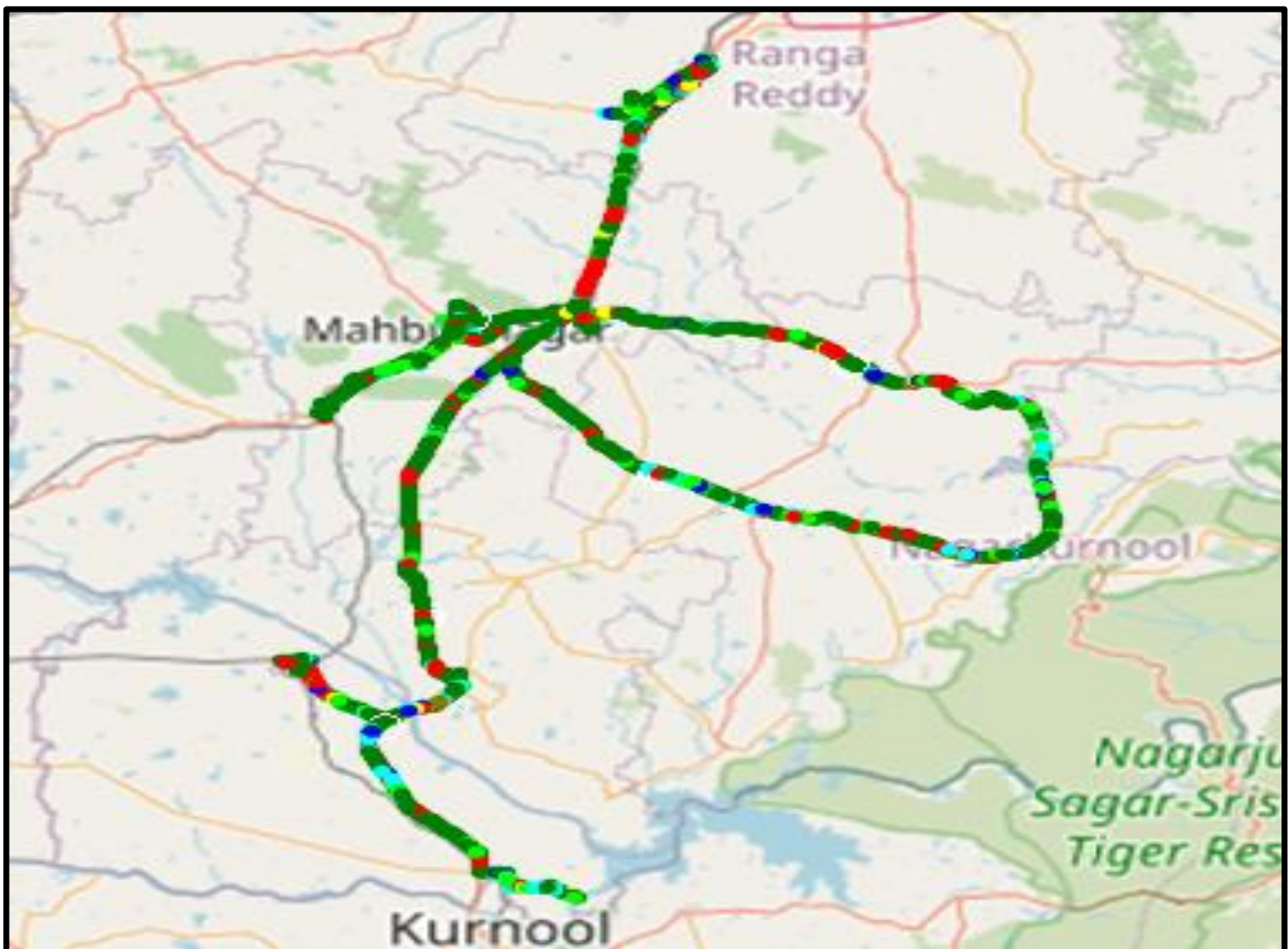
DL Throughput	No of Sample	%
0 to 1 Mbps	1816	3.28
1 to 2 Mbps	1561	2.82
2 to 3 Mbps	1468	2.65
3 to 4 Mbps	1531	2.77
4 to 8 Mbps	5847	10.57
8 to 12 Mbps	4923	8.9
>12 Mbps	38176	69.01
Total	55322	100

IV. Dynamic Data Test- 3G / 4G DL Details

VIL

Data Statistics - Dynamic Complete SSA

Data KPIs - Overall	4G
Download Throughput (Mbps)	26.34



DL throughput	No of Sample	%
0 to 1 Mbps	658214	4.27
1 to 2 Mbps	366945	2.381
2 to 3 Mbps	335146	2.174
3 to 4 Mbps	339980	2.206
4 to 8 Mbps	1400372	9.086
8 to 12 Mbps	1378366	8.943
>12 Mbps	10934120	70.94
Total	15413143	100

Airtel

Technology 4G	1. Shadnagar bus stand	2. Jogulamba temple	3. Nagarkurnool Market yard	4. Mahbubnagar Clock tower
Download in Mbps	53.18	97.02	78.88	66.87
Upload in Mbps	15.87	25.55	27.82	19.90

Technology 4G	5. Mahbubnagar Railway station	6. Mahbubnagar Govt hospital	7. SVS medical College
Download in Mbps	74.26	75.98	65.54
Upload in Mbps	34.19	7.37	14.65

BSNL

Technology 3G/4G	1. Shadnagar bus stand 4G	2. Jogulamba temple 3G	3. Nagarkurnool Market yard 4G	4. Mahbubnagar Clock tower 4G
Download in Mbps	37.09	3.86	13.17	11.73
Upload in Mbps	15.93	1.06	7.83	2.89

Technology 3G/4G	5. Mahbubnagar Railway station 4G	6. Mahbubnagar Govt hospital 4G	7. SVS medical College 4G
Download in Mbps	7.31	7.18	2.29
Upload in Mbps	6.75	0.54	0.44

JIO

Technology 4G	1. Shadnagar bus stand	2. Jogulamba temple	3. Nagarkurnool Market yard	4. Mahbubnagar Clock tower
Download in Mbps	81.59	97.17	103.74	84.74
Upload in Mbps	10.53	17.95	10.52	17.38

Technology 4G	5. Mahbubnagar Railway station	6. Mahbubnagar Govt hospital	7. SVS medical College
Download in Mbps	98.52	58.21	91.46
Upload in Mbps	18.33	24.89	17.9

VIL

Technology 4G	1. Shadnagar bus stand	2. Jogulamba temple	3. Nagarkurnool Market yard	4. Mahbubnagar Clock tower
Download in Mbps	19.36	23.48	18.11	16.39
Upload in Mbps	8.54	7.01	7.85	6.3

Technology 4G	5. Mahbubnagar Railway station	6. Mahbubnagar Govt hospital	7. SVS medical College
Download in Mbps	25.65	19.62	27.66
Upload in Mbps	13.18	8.31	21.78

VI. NH/SH Routes covered

NH / SH Routes covered in OADT by Airtel / BSNL / RJIL / VIL				
S. No	No of NH/SH routes	NH routes	SH routes	Distance(Km)
1	Mahbubnagar to Shadnagar	NH 44, NH 167		61KMS
2	Jadcharla to Gadwal	NH 44		126 kms
3	Jadcherla to Nagarkurnool	NH 167, NH 765	SH 20	174kms
4	Mehabubnagar to Devarakadra	NH167	SH 5	30kms