भादूविप्रा
TRAI

Operator Assisted Drive Test Report

Gorakhpur City and nearby Area
19/03/2025 to 21/03/2025
By
TRAI Regional Office Bhopal

The Operator Assisted Drive Test has been carried out by Regional Office, Bhopal with the help of Telecom Service Providers for Gorakhpur City and surrounding areas from 9:00AM to 8:00PM from 19/03/2025 to 21/03/2025. The drive test covered drive route of around 330KMs.

TSP	Network tested
Airtel	2G & VoLTE
BSNL	2G & 3G
JIO	VoLTE
VIL	2G, VoLTE

Key Performance Indicators:

KPI	Benchmark	Observations
Drop call rate %	≤2%	All TSPs achieved the benchmark
CSSR %	≥98 %	All TSPs achieved the benchmark except BSNL in 2G & 3G
Mobility HOSR %	≥95%	All TSPs achieved the benchmark
Good RX Quality %	≥95%	All TSPs achieved the benchmark except BSNL 3G

Overview

Regional Office, TRAI Bhopal conducted Operator Assisted Drive Test. The performance of Airtel, BSNL, Vodafone Idea and Jio was monitored across various technologies (2G, 3G,4G & 5G). 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:
i.   2G – measurement – UE Locked in 2G
ii.   3G – measurement – UE in Dual mode (2G and 3G)
iii. 4G – measurement – UE in Free mode

Calls were made for the **90-sec** duration with a wait time of **10 sec** between calls in all technologies.

Data Tests:
Dynamic data – repeat data file download (to check throughput on the entire route)

i.   3G – measurement – UE in 3G   File Size- 20MB
ii.   4G – measurement – UE in LTE File Size- 40MB
iii. 5G – measurement – UE in 5G File Size- 200MB
Static Data: Download and Upload Throughputs, Web Browsing Delay, Video Streaming Delay, and Latency
i.   Download- 3G - 20 MB, 4G - 40MB, 5G -200 MB
ii.   Upload - 3G - 5 MB, 4G - 10MB, 5G – 100 MB
iii. Web browsing - 3 links of e-commerce websites https://www.amazon.in, https://www.flipkart.com, https://paytm.com.
iv.   Video Streaming – 130 sec clip
v.   Latency – 32 Bytes on www.google.com.

Voice & Dynamic Data Test Drive Route
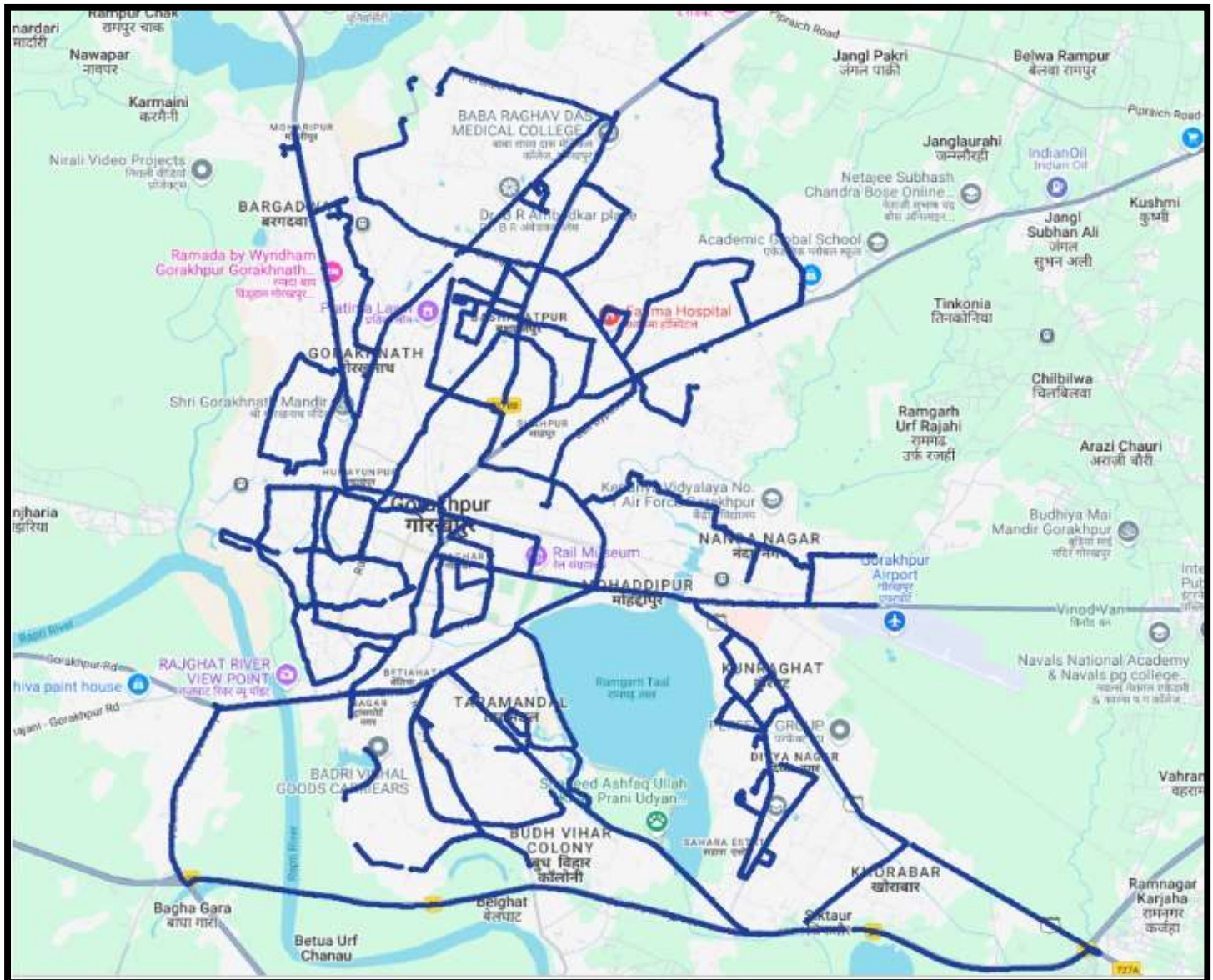
List of important area covered during the drive test
Mohaddi pur, Rustampur
Ghanta Ghar, Nausadh
Transport nagar,
Betiyahata , Bichiya colony
Golghar, Railway colony
Bargadwa, Nandanagar
Ramghar Tal,Bandha Road

Overview

Data Service Test- Static Locations

Hotspot Locations
Gorakhnath Temple
Gorakhpur Railway Station
BRD Medical College
Bus Stand
Airport
MMM Engineering College

Voice Calls

QoS compliance of the TSPs   for Voice across technologies 2G/3G/4G-VoLTE:
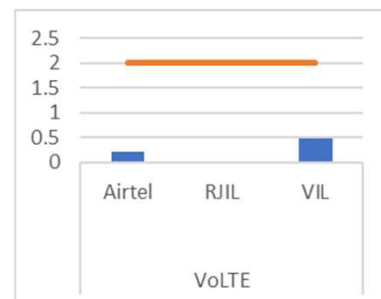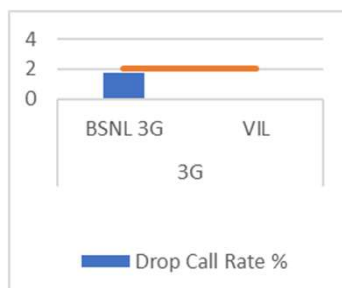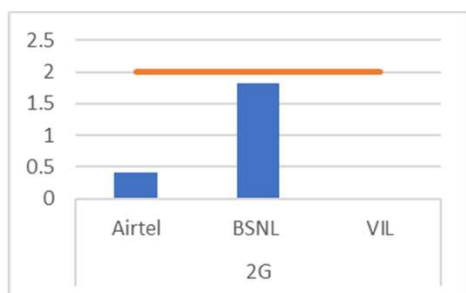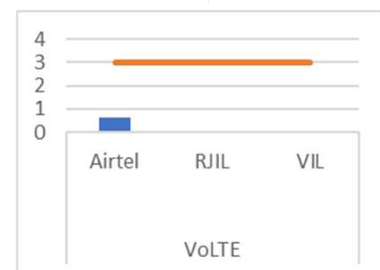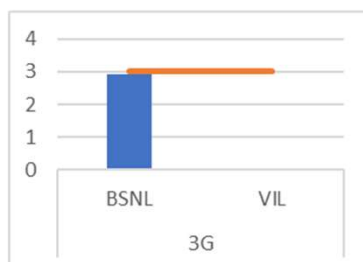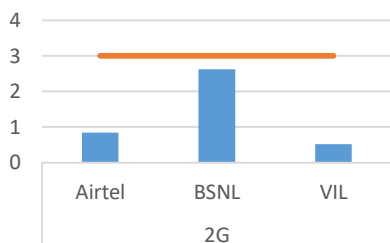
	2G			3G		VoLTE		
KPIs	**Airtel**	**BSNL**	**VIL**	**BSNL**	**VIL**	**Airtel**	**RJIL**	**VIL**
Drop Call Rate %	0.42	1.82	0	1.75	NA	0.21	0	0.49
Block Call Rate %	0.84	2.62	0.52	2.91	NA	0.63	0	0

All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%)

Voice Calls

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	97.45	82.77	97.9

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

TSPs	3G
	BSNL
Coverage %	88.79

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

TSPs	VoLTE		
	Airtel	JIO	VIL
Coverage %	99.72	99.95	97.85

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

TSPs	3G		VoLTE		
	BSNL	VIL	Airtel	VIL	JIO
Time Spent on 3G/4G %	100	NA	100	100	100

Data Services Dynamic

Dynamic Data -Download Throughput was tested.

Data Download Performance – Dynamic 3G/4G/ 5G Network

Dynamic average data download throughput

■ Average Download throughput- 3G in Mbps   ■ Average Download throughput-LTE in Mbps
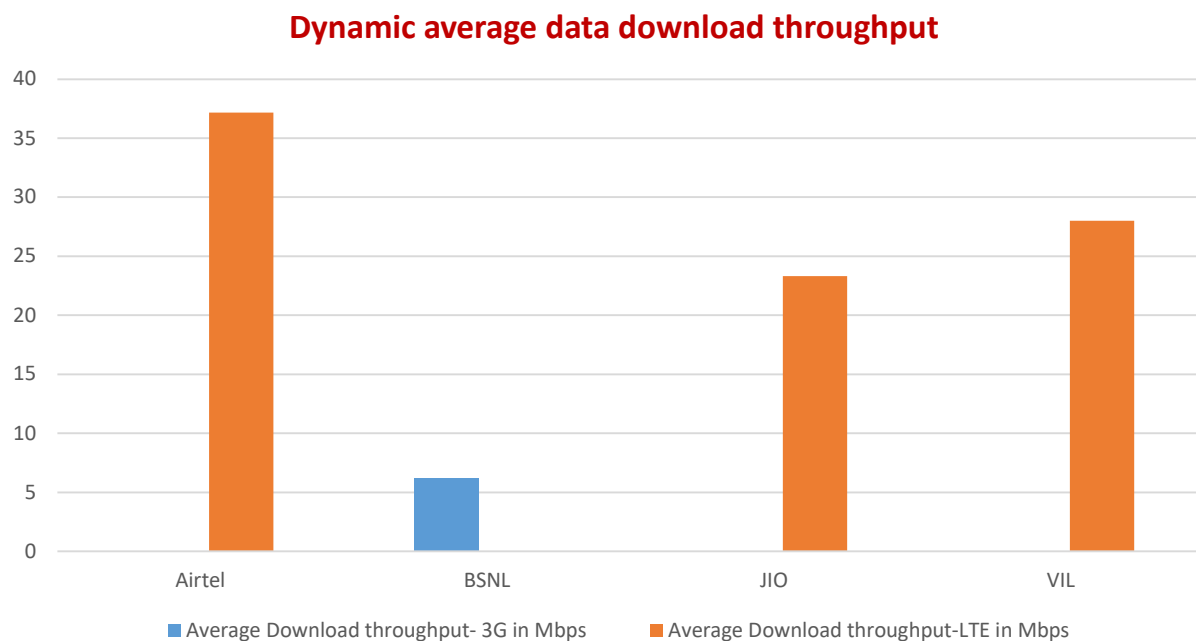
TSP	Airtel	BSNL	JIO	VIL
Average Download throughput- 3G In Mbps	NA	6.2	NA	NA
Average Download throughput-LTE in Mbps	37.16	NA	23.3	28
Average Download throughput- 5G in Mbps	NA	NA	NA	NA

Summary

TSP (For 2G)	Airtel	BSNL	VIL
Call attempts	474	638	570
Block call rate %	0.84	2.62	0.52
CSSR %	99.15	97.38	99.48
Drop call rate %	0.42	1.82	0
Mobility HOSR %	99.57	94.31	99.82
RX Quality %	98.19	96.24	96.04
Average CST Sec	3.9	2.1	3.21

TSP (For 3G)	BSNL
Call attempts	614
Block call rate %	2.91
CSSR %	97.09
Drop call rate %	1.75
Mobility HOSR %	100
RX Quality %	92.49
Average CST (Sec)	1.9

TSP (For Volte)	Airtel	BSNL	JIO	VIL
Call attempts	474	NA	579	608
Block call rate %	0.63	NA	0	0
CSSR %	99.36	NA	100	100
Drop call rate %	0.21	NA	0	0.49
Mobility HOSR %	99.78	NA	99.92	99.8
RX Quality %	97.38	NA	97.53	95.69
Average CST(Sec)	2.45	NA	1.176	0.63

Summary

TSP (For 3G)	BSNL
Download throughput in Mbps	6.13
Upload Throughput in Mbps	1.99
Video streaming delay in sec	2.89
Web browsing delay in second	3.08
Latency in (msec)	64.285

TSP (For LTE)	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	29.66	NA	55.29	32.65
Upload Throughput in Mbps	9.83	NA	14.39	10.5
Video streaming delay in sec	0.43	NA	1.90	1.78
Web browsing delay in second	0.27	NA	1.59	2.45
Latency in (msec)	43.28	NA	26.40	53.33

TSP (For 5G)	Airtel	BSNL	JIO	VIL
Download throughput in Mbps	158.4	NA	193.97	NA
Upload Throughput in Mbps	38.2	NA	34.63	NA
Video streaming delay in sec	0.17	NA	2.07	NA
Web browsing delay in second	0.09	NA	1.31	NA
Latency in (msec)	28.54	NA	27.43	NA

Data was tested at 6 locations .Following services were tested: Data Download/Upload, Latency (www.google.com), and Web browsing (Flipkart, Amazon, PayTm)

3G/4G/ 5G Network

Static - Average download throughput

Static - Average Upload throughput

Static- Video streaming delay in sec

Static- Web browsing delay in second

Static -Latency in (msec)
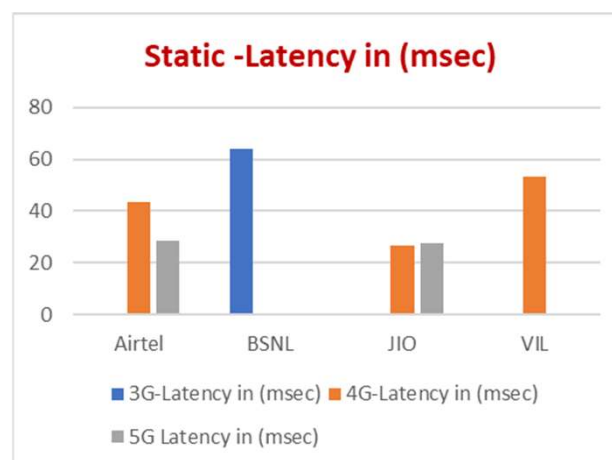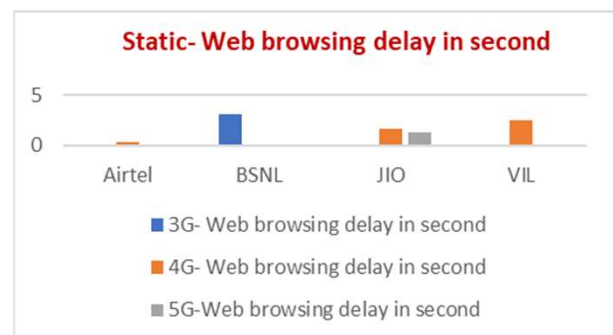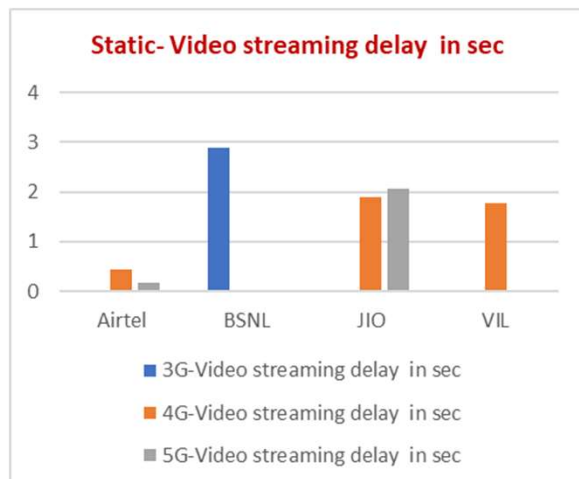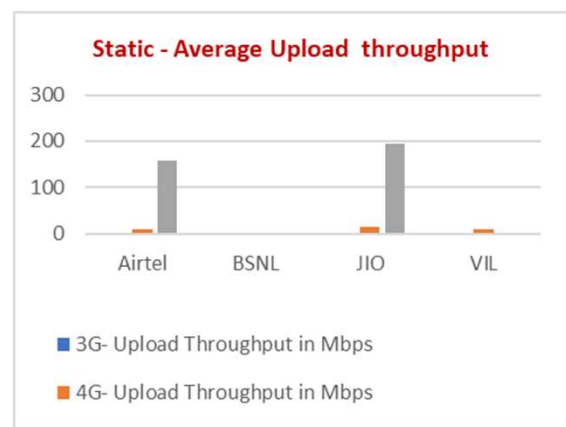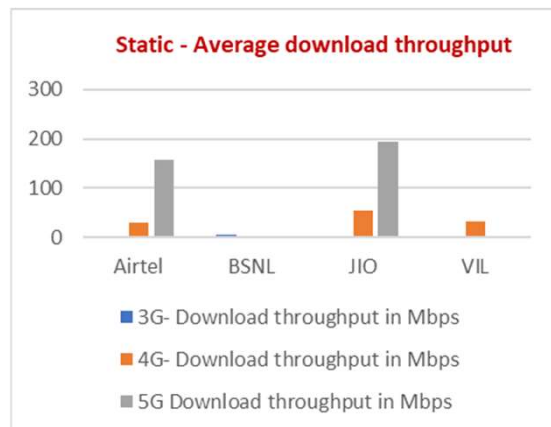
1. Hotspot Location:- Madan Mohan Malviya University (MMM)

	3G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	NA	6.13	NA	NA
Upload Throughput in Mbps	NA	0.89	NA	NA
Video streaming delay in sec	NA	3.15	NA	NA
Web browsing delay in second	NA	3.12	NA	NA
Latency in (msec)	NA	83.31	NA	NA

	LTE			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	46.21	NA	65.74	23
Upload Throughput in Mbps	7.61	NA	40.69	19
Video streaming delay in sec	0.31	NA	1.7	3.41
Web browsing delay in second	0.16	NA	1.48	1.66
Latency in (msec)	46.5	NA	24.65	58

	5G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	221.04	NA	301.73	NA
Upload Throughput in Mbps	20.45	NA	53.93	NA
Video streaming delay in sec	0.29	NA	1.7	NA
Web browsing delay in second	0.05	NA	1.13	NA
Latency in (msec)	22.2	NA	16.65	NA

Summary

2. Hotspot Location:- Gorakhpur Airport

	3G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	NA	7.41	NA	NA
Upload Throughput in Mbps	NA	4.55	NA	NA
Video streaming delay in sec	NA	2.61	NA	NA
Web browsing delay in second	NA	2.69	NA	NA
Latency in (msec)	NA	55	NA	NA

	LTE			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	21.16	NA	42.32	33
Upload Throughput in Mbps	11.47	NA	10.37	2
Video streaming delay in sec	0.56	NA	2.4	5.68
Web browsing delay in second	0.34	NA	2.62	3.20
Latency in (msec)	33.5	NA	31.6	96.0

	5G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	NA	NA	101.17	NA
Upload Throughput in Mbps	NA	NA	22.08	NA
Video streaming delay in sec	NA	NA	3.8	NA
Web browsing delay in second	NA	NA	1.59	NA
Latency in (msec)	NA	NA	31.35	NA

3. Hotspot Location:- BRD Medical College

	3G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	NA	5.89	NA	NA
Upload Throughput in Mbps	NA	1.43	NA	NA
Video streaming delay in sec	NA	2.71	NA	NA
Web browsing delay in second	NA	3.10	NA	NA
Latency in (msec)	NA	58.3	NA	NA

	LTE			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	20.17	NA	42.23	29
Upload Throughput in Mbps	10.13	NA	14.28	10
Video streaming delay in sec	0.46	NA	2.3	1.19
Web browsing delay in second	0.30	NA	1.33	2
Latency in (msec)	49.3	NA	20.65	30

	5G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	120.51	NA	198.4	NA
Upload Throughput in Mbps	56.13	NA	40.79	NA
Video streaming delay in sec	0.30	NA	1.72	NA
Web browsing delay in second	0.12	NA	1.38	NA
Latency in (msec)	36.3	NA	30	NA

4. Hotspot Location:- Bus Stand

	3G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	NA	3.12	NA	NA
Upload Throughput in Mbps	NA	1.23	NA	NA
Video streaming delay in sec	NA	2.85	NA	NA
Web browsing delay in second	NA	2.97	NA	NA
Latency in (msec)	NA	69.9	NA	NA

	LTE			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	15.37	NA	41.37	39
Upload Throughput in Mbps	5.65	NA	9.14	18
Video streaming delay in sec	0.54	NA	1.9	3.04
Web browsing delay in second	0.28	NA	1.55	5.14
Latency in (msec)	35.5	NA	29.65	49

	5G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	103.42	NA	160.69	NA
Upload Throughput in Mbps	22.53	NA	54.01	NA
Video streaming delay in sec	0.10	NA	2.21	NA
Web browsing delay in second	0.06	NA	1.34	NA
Latency in (msec)	34.4	NA	34.15	NA

Summary

5. Hotspot Location:- Railway Station

	3G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	NA	6.12	NA	NA
Upload Throughput in Mbps	NA	2.13	NA	NA
Video streaming delay in sec	NA	2.9	NA	NA
Web browsing delay in second	NA	3.2	NA	NA
Latency in (msec)	NA	64.2	NA	NA

	LTE			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	22.64	NA	76.08	22
Upload Throughput in Mbps	7.19	NA	6.04	9
Video streaming delay in sec	0.40	NA	1.27	1
Web browsing delay in second	0.30	NA	1.21	0.6
Latency in (msec)	45.5	NA	26	63

	5G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	134.85	NA	122.13	NA
Upload Throughput in Mbps	20.08	NA	13.55	NA
Video streaming delay in sec	0.16	NA	1.4	NA
Web browsing delay in second	0.13	NA	1.41	NA
Latency in (msec)	26.5	NA	27.6	NA

6. Hotspot Location:- Gorakhnath Mandir

	3G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	NA	8.12	NA	NA
Upload Throughput in Mbps	NA	1.71	NA	NA
Video streaming delay in sec	NA	3.1	NA	NA
Web browsing delay in second	NA	3.4	NA	NA
Latency in (msec)	NA	55	NA	NA

	LTE			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	54.49	NA	64.02	43
Upload Throughput in Mbps	17.36	NA	5.82	19
Video streaming delay in sec	0.25	NA	1.8	1.80
Web browsing delay in second	0.23	NA	1.34	3.85
Latency in (msec)	49.4	NA	25.85	58

	5G			
	Airtel	**BSNL**	**JIO**	**VIL**
Download throughput in Mbps	207.82	NA	279.68	NA
Upload Throughput in Mbps	67.24	NA	23.42	NA
Video streaming delay in sec	0.04	NA	1.61	NA
Web browsing delay in second	0.06	NA	1.03	NA
Latency in (msec)	23.3	NA	24.85	NA

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	97.45
BSNI 2G	82.77
VIL 2G	97.9
BSNL 3G	88.79
Airtel VoLTE	99.72
Jio VoLTE	99.95
VIL VoLTE	97.85

TSP- Airtel

Technology	Coverage %
2G	97.45

2G

Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	2230837	73.98	
[-75, >=-85)	707569	23.47	
[-85, >=-95)	60221	2	
[-95, >=Min)	17075	0.57	
Total	3015702		

TSP-BSNL

Technology	Coverage %
2G	82.77

2G
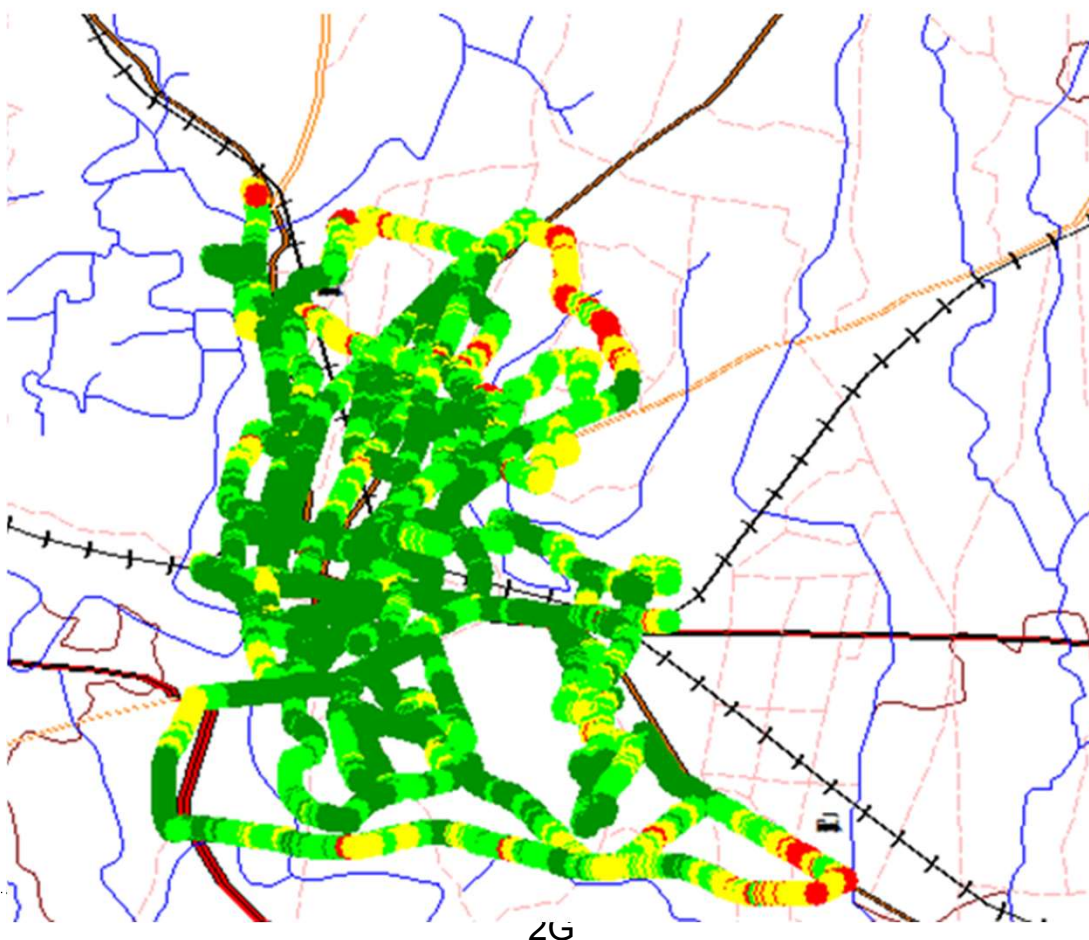
Overall RxLevel	# Samples	% PDF	Legends
[Max, >=-75]	2604	50.17	
[-75, >=-85)	1692	32.6	
[-85, >=-95)	786	15.14	
[-95, >=Min)	108	2.08	
Total	5190	100	

TSP - VIL

Technology	Coverage %
2G	97.9%

2G			
Overall RxLevel	**# Samples**	**% PDF**	**Legends**
[Max, >=-75]	19073	75.22%	
[-75, >=-85)	5751	22.68%	
[-85, >=-95)	527	2.08%	
[-95, >=Min)	4	0.02%	
Total	25355	100%	

TSP- BSNL

Technology	Coverage %
3G	88.79
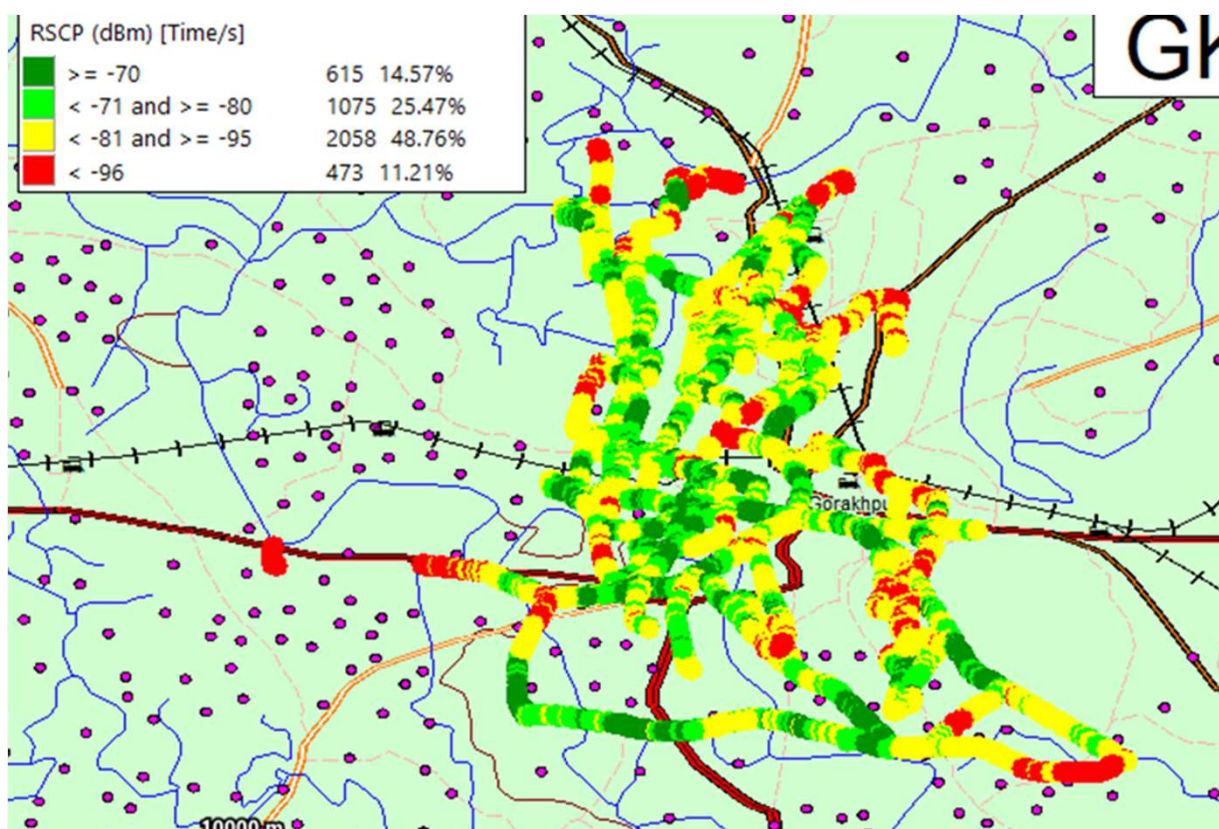
Overall RSCP	# Samples	% PDF	Legends
[Max, >=-70]	615	14.57	
[-70, >=-80)	1075	25.47	
[-80, >=-90)	2058	48.76	
[-90, >=Min)	473	11.21	
Total	4221	**100**	

Coverage Details

TSP- Airtel

Technology	Coverage %
VoLTE	99.72

VoLTE

Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	227313	66.88	
[-80, >=-90)	92254	27.15	
[-90, >=-110)	19329	5.69	
[-110, >=Min)	1008	0.3	
Total	339904		

TSP-Jio

Technology	Coverage %
VoLTE	99.95

VoLTE

Overall RSRP	# Samples	% PDF	Legends
[Max, >=-80]	36279	59.58	
[-80, >=-90)	18043	29.64	
[-90, >=-110)	6528	10.72	
[-110, >=Min)	32	0.052	
Total			

TSP - VIL

Technology	Coverage %
VoLTE	97.85%

VoLTE			
Overall RSRP	**# Samples**	**% PDF**	**Legends**
[Max, >=-80]	2557	10.02%	
[-80, >=-90)	7001	27.43%	
[-90, >=-110)	15416	60.40%	
[-110, >=Min)	549	2.15%	
Total	25523	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	97.02
BSNI 2G	96.24
VIL 2G	96.04
BSNL 3G	92.49
Airtel VoLTE	97.38
Jio VoLTE	97.53
VIL VoLTE	95.69
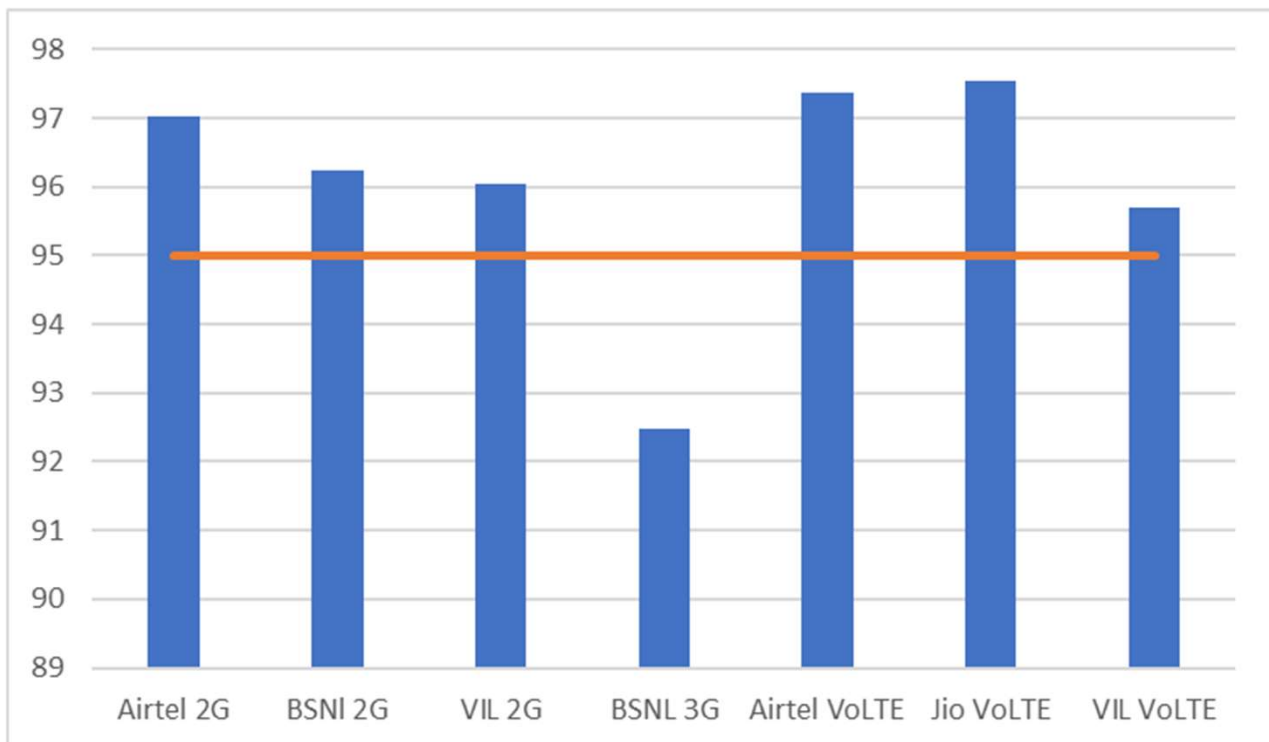
For measuring voice quality, as per the QoS norms, RxQual <=5 for GSM TSPs, EcNo >= -14 dBm for 3G TSP sand SINR >0 in case of VoLTE is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be ≥ 95%.

TSP- Airtel

Technology	Rx Quality %
2G	97.02
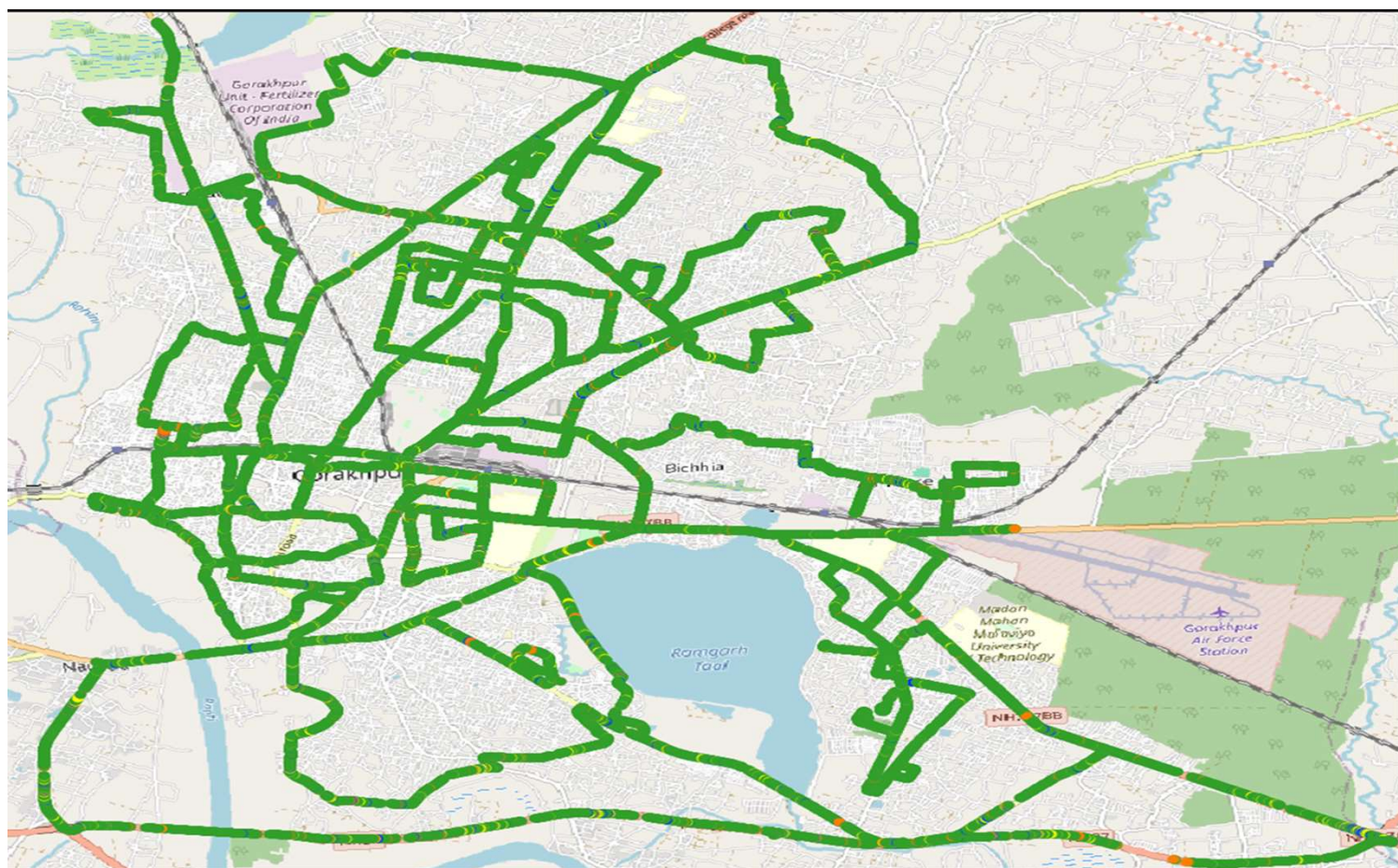
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	2735584	92.67	
(2, <=3)	71400	2.42	
(3 , <=4)	56784	1.93	
(4 , <=5)	34285	1.17	
(5 , <=Max)	74176	2.52	
Total	2952229		

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-BSNL

Technology	Rx Quality %
2G	96.24

RX quality [Time/s]
<= 2	3834	84.82%
>= 2 and <= 3	258	5.71%
>= 3 and <= 4	152	3.36%
>= 4 and <= 5	106	2.35%
>= 5 and <= 7	170	3.76%
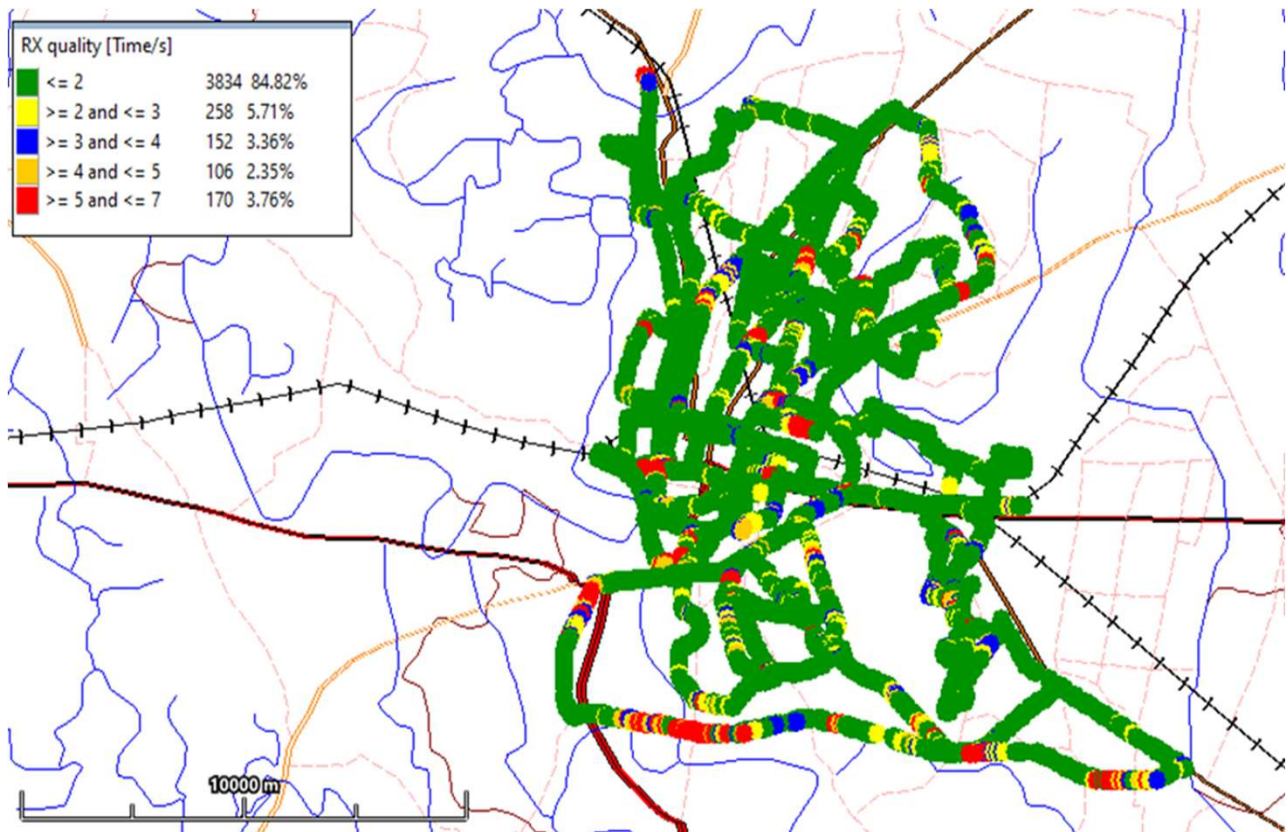
Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	3834	84.82	
(2, <=3)	258	5.71	
(3 , <=4)	152	3.36	
(4 , <=5)	106	2.35	
(5 , <=Max)	170	3.76	
Total	4520	100	

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 - VIL

Technology	Rx Quality %
2G	96.04%

Overall Rx Quality	# Samples	% PDF	Legends
(Min, <=2)	18074	82.56%	🟩
(2, <=3)	1271	5.81%	🟨
(3 , <=4)	1080	4.93%	🟦
(4 , <=5)	599	2.74%	🟧
(5 , <=Max)	867	3.96%	🟥
Total	21891	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-BSNL

Technology	Rx Quality %
3G	92.49

Overall Ec/No	# Samples	% PDF	Legends
(Max, <=-6)	69379	72.31	
(-6, <=-9)	0	0	
(-9, <=-11)	0	0	
(-11, <=-14)	0	0	
(-14, <= Min)	26572	27.69	
Total	95951	**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- Airtel

| Technology	Rx Quality %
VoLTE	97.38
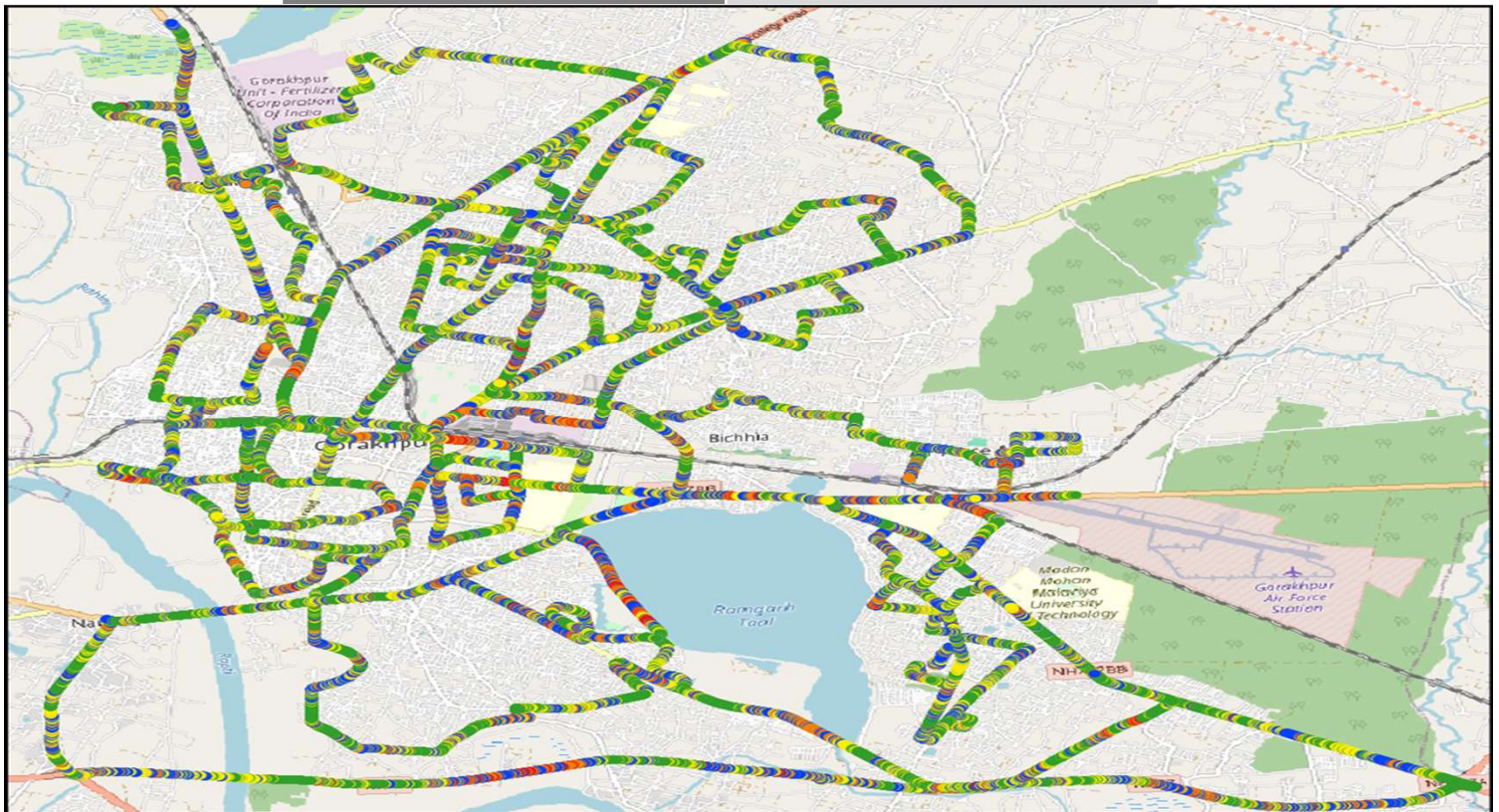
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	8916	2.65	
(0, <=5)	65613	19.43	
(5, <=10)	73779	21.85	
(10, <=15)	69913	20.71	
(15, <=Max)	119491	35.39	
Total	337712		

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-Jio

| Technology	Rx Quality %
VoLTE	97.53
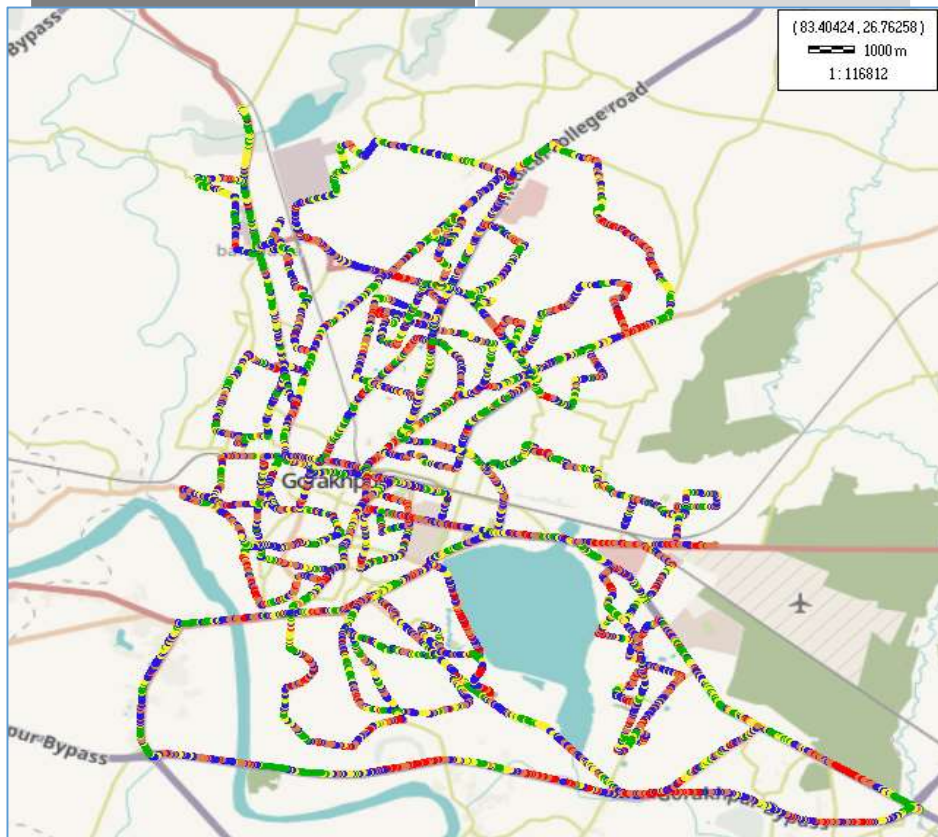
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	1502	2.46	
(0, <=5)	13470	22.12	
(5, <=10)	19171	31.49	
(10, <=15)	14261	23.42	
(15, <=Max)	12478	20.49	
Total	60882		

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 - VIL

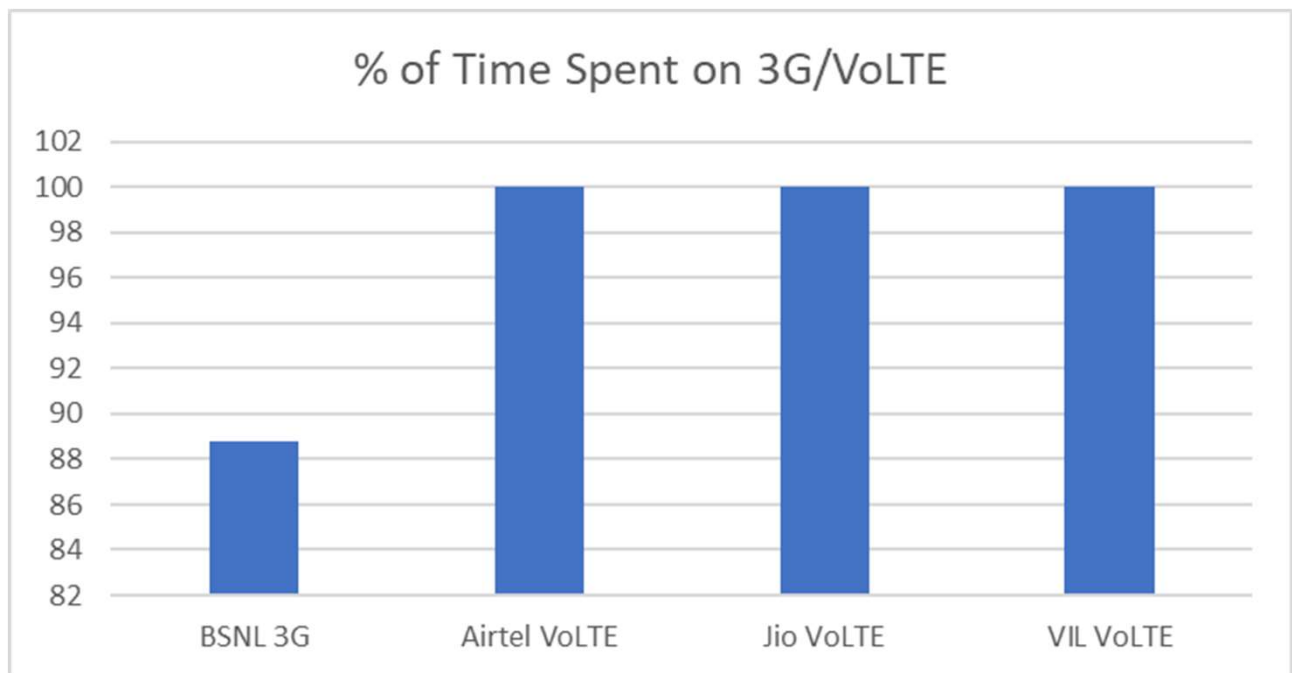| Technology	Rx Quality %
VoLTE	95.69%
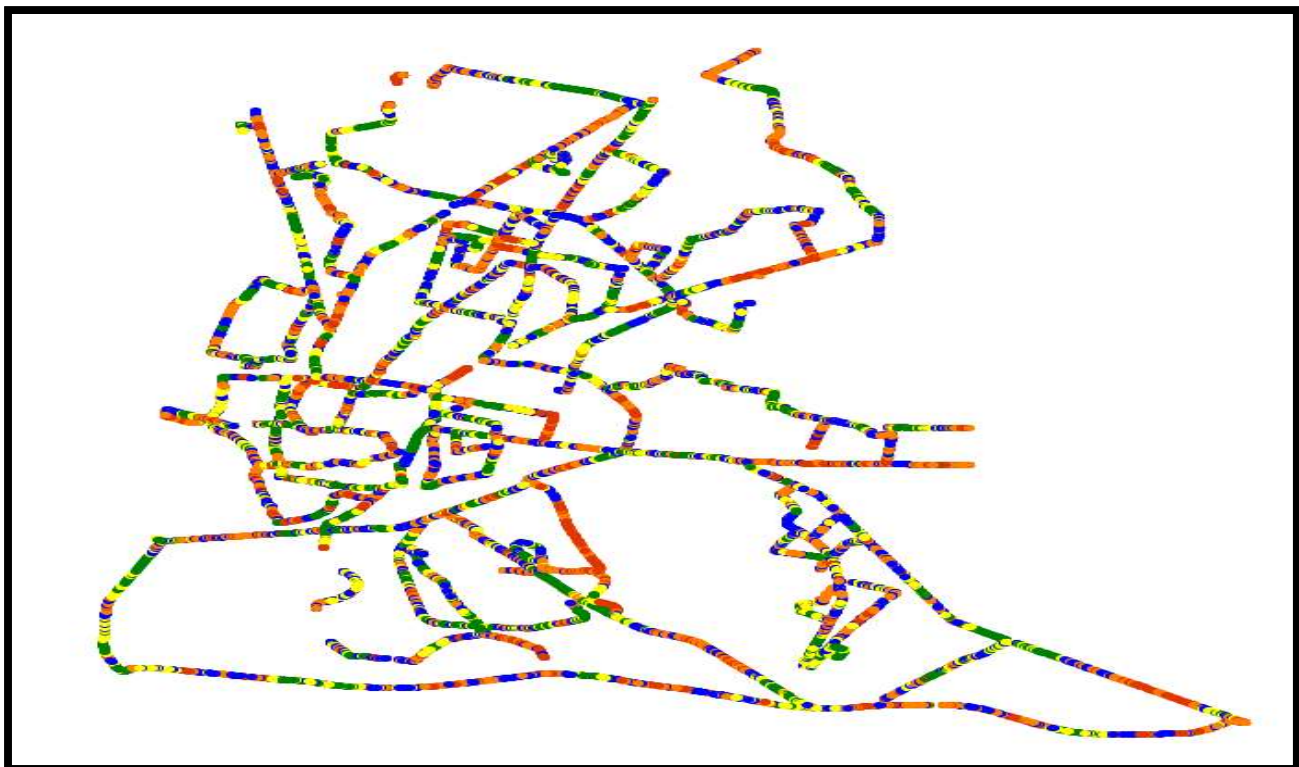
Overall SINR	# Samples	% PDF	Legends
(Min, <=0)	649075	4.31%	
(0, <=5)	5310620	35.30%	
(5, <=10)	1425556	9.47%	
(10, <=15)	6521709	43.35%	
(15, <=Max)	1138541	7.57%	
Total	15045501	100%	

TSP	% of Time Spent on 3G/VoLTE
BSNL 3G	88.79
Airtel VoLTE	100
Jio VoLTE	100
VIL VoLTE	100

% of Time Spent on 3G/VoLTE

TSP- Airtel

Technology	% of Time Spent on
3G	NA
VoLTE	100
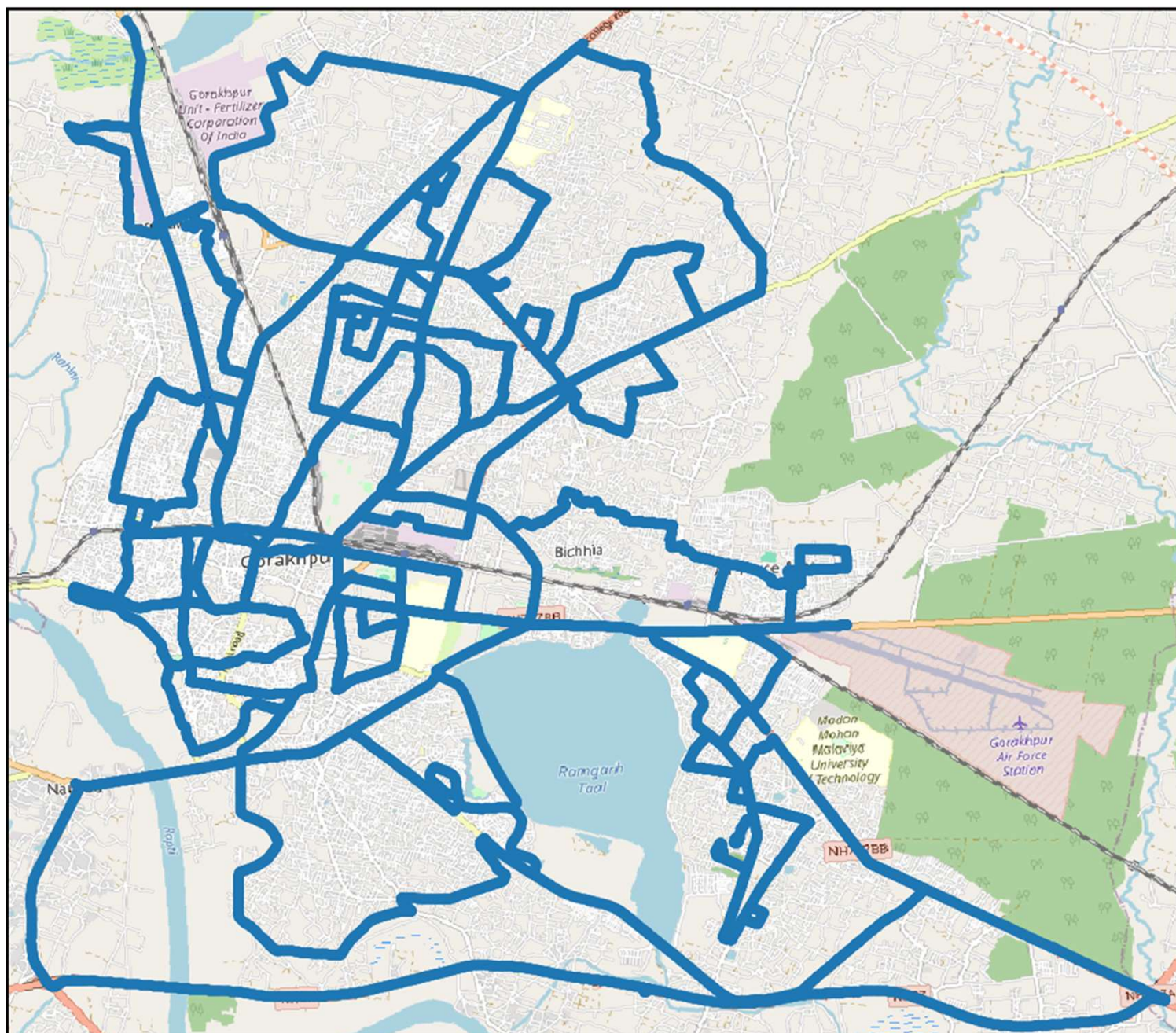
TSP-Jio

Technology	% of Time Spent on
3G	
VoLTE	100
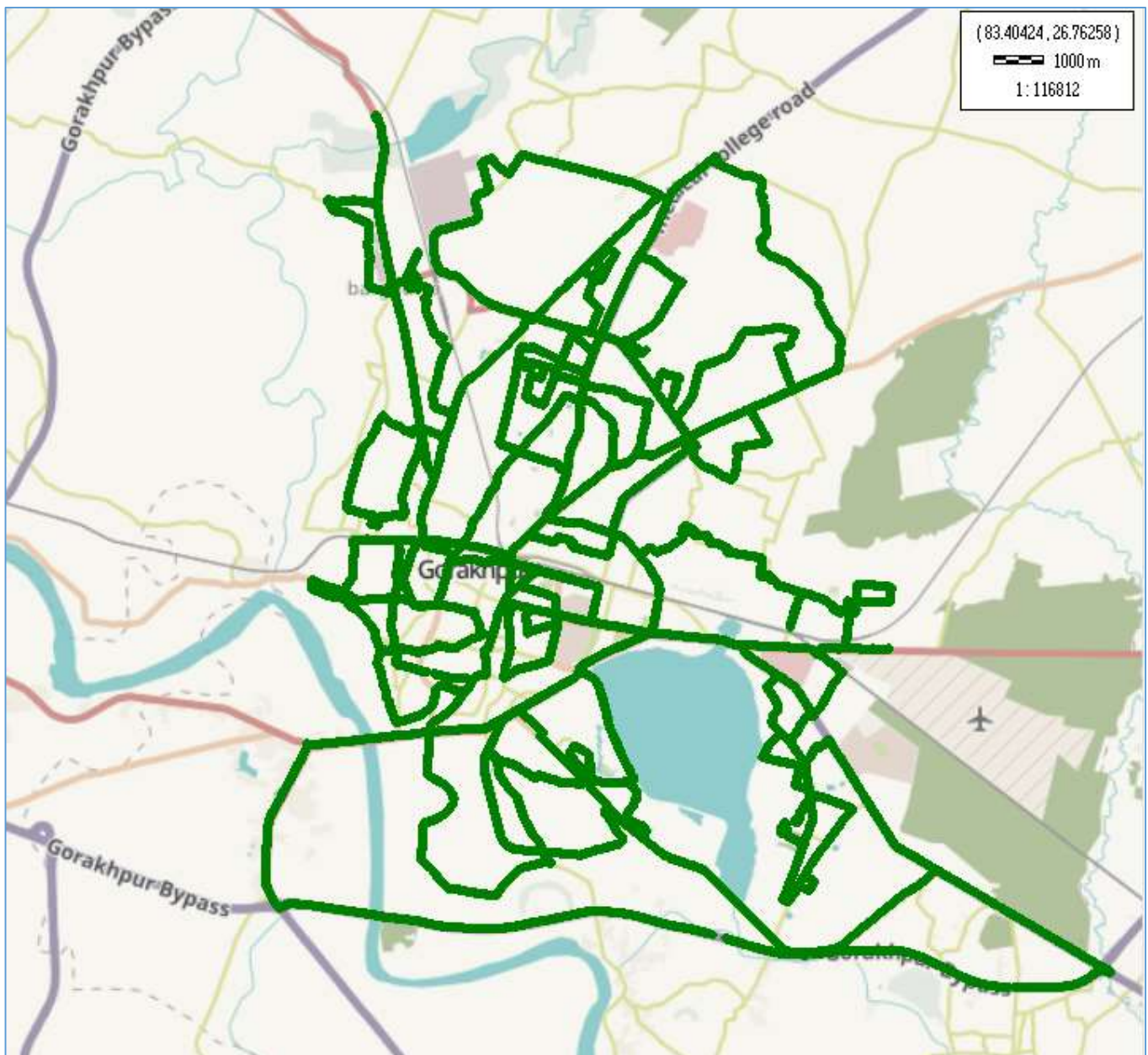
TSP- BSNL

Data Statistics - Dynamic data testing

Data KPIs - Overall	3G
Download Throughput (Mbps)	6.2

Throughput (0-50Mbps) [Time/s]
- >= 10000000 (green)
- >= 5000000 and < 10000000 (yellow)
- >= 1000000 and < 5000000 (orange)
- < 1000000 (red)

10000 m

DL throughput	No of Sample	%	Legends
< 1 Mbps			
1-5 Mbps			
5-10 Mbps			
>10Mbps			

TSP- Airtel

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	98.04
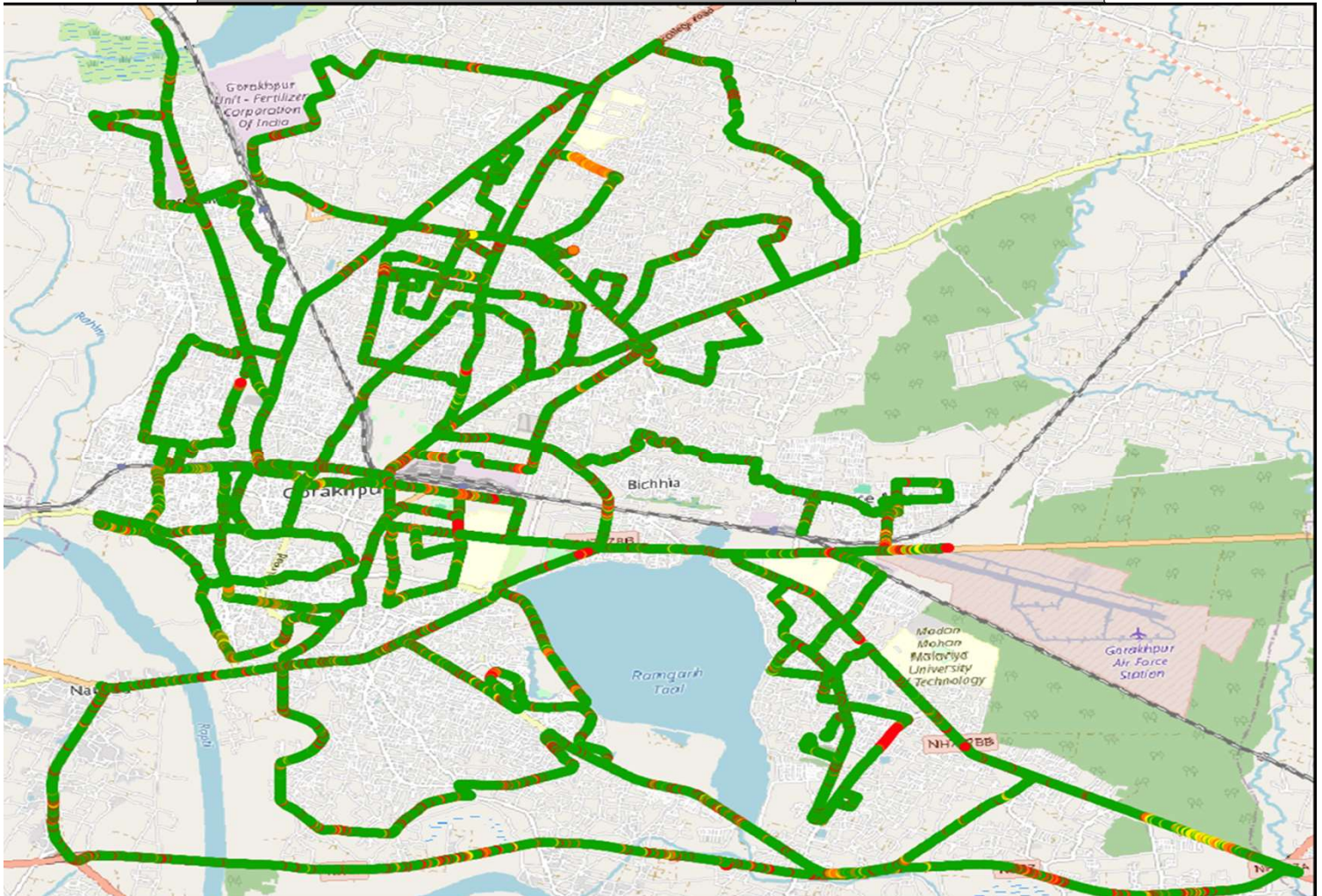
DL throughput	No of Sample	%	Legends
< 2Mbps	1241	1.97	
2-5 Mbps	2338	3.71	
5-10 Mbps	2975	4.72	
>10Mbps	56521	89.61	

TSP-Jio

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	**23.368**

DL throughput	No of Sample	%	Legends
< 2Mbps	12422	21.61	
2-5 Mbps	3592	6.25	
5-10 Mbps	5636	9.80	
>10Mbps	35832	62.34	

TSP - VIL

Data Statistics - Dynamic data testing

Data KPIs - Overall	LTE
Download Throughput (Mbps)	97.52

DL throughput	No of Sample	%	
			Legends
< 2Mbps	517739	2.48	
2-5 Mbps	691421	3.32	
5-10 Mbps	1703004	8.18	
>10Mbps	17892546	86.02	
Total=	20804710	100%	