Operator Assisted Drive Test Report

For

TUMKUR
Feb. 2022

RO, Bengaluru

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, Bengaluru with the help of Service Providers in Tumkur and adjacent cities from 9:00 AM to 8:00 PM from 22nd to 25th Feb. 2022. The drive test covered drive route of 350 KMs & 7 hotspots over a period of 4 days. Approximately 480+ 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

Regional Office, TRAI Bengaluru conducted Operator Assisted Drive Test from 22nd to 25th Feb 2022 covering various locations in Tumkur City & surrounding regions. The performance of Airtel, BSNL, Vodafone Idea and Jio were monitored across various technologies (2G, 3G and 4G/VoLTE). 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, Video Streaming and Latency.

Drive Test Details For Tumkur:

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 350 KMs over a period of 3 days from 22nd to 24th Feb. 2022. Approximately 480+ calls were made for each of the 7 networks: three 2G (Lock Mode) networks, one 3G (Dual mode) network and three VoLTE networks covering 4 unique TSPs.

Data Tests: Dynamic data test was conducted for 350 kms over a period of 3 days for download throughput and Upload Throughput for 3G & 4G technologies. Data Tests were performed at 7 static locations; three 2G (Lock mode) networks, one 3G (Dual mode) network and three 4G (Free mode) networks covering 4 unique TSPs were tested.

* For Voice and Data KPI's, 2G measurement is done with UE locked on 2G, 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 PayTm
Latency	32 Bytes on www.google.com
Video Streaming	130 secs clip

Voice & Dynamic Data Test Drive Route

Madhugiri

Tumkur

Kunigal

Voice & Dynamic Data Test Drive Route

Data Service Test- Static Locations
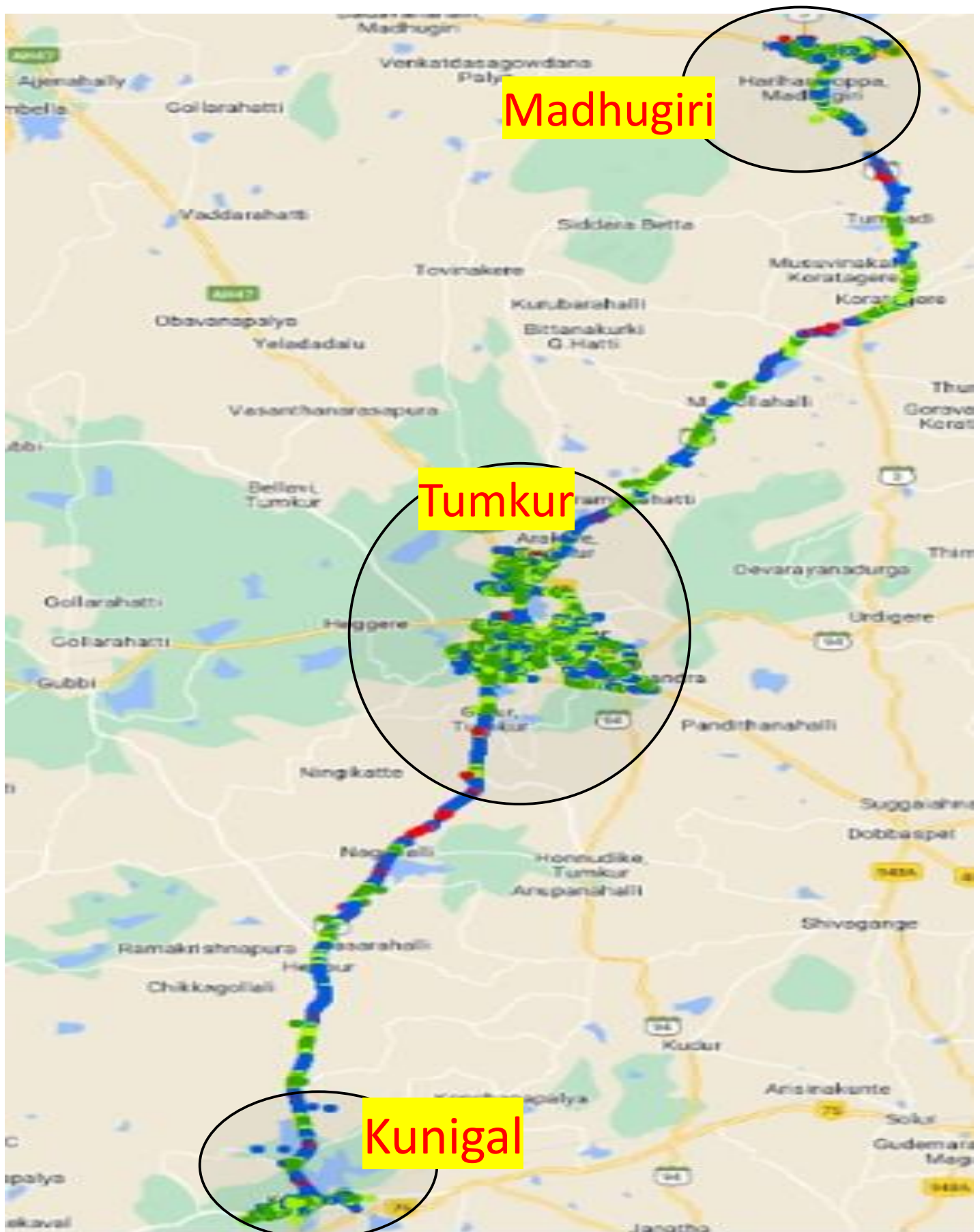
Areas covered	
Tumkur-Sadashiva Nagar	Tumkur -PH Colony
Tumkur-Shanti Nagar	Tumkur-Industrial Area
Tumkur-Antharasanahalli Industrial Area	Tumkur- Hanumantpur
Tumkur-Bus Stand	Tumkur -MG Road
Tumkur-Ashoka Road	Tumkur- Melekote
Tumkur- SS Puram	Tumkur – KYATHASANDRA
Tumkur- Yellapura	Tumkur-Sira Gate
Tumkur- Ring Road	Tumkur -Gandhi Nagar
Tumkur- Vidya Nagar	Tumkur Madhugiri Highway
Madhugiri- Bus Stand	Madhugiri- Town Hall Road
Madhugiri- Pavagada Rd	Tumkur Kunigal Highway
Hebbur Road	Kunigal- Kunigal Town Rd
Kunigal - BM Road	Kunigal – Vidya Nagar

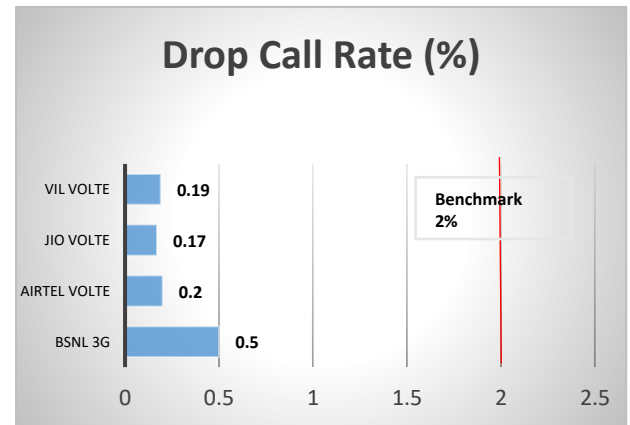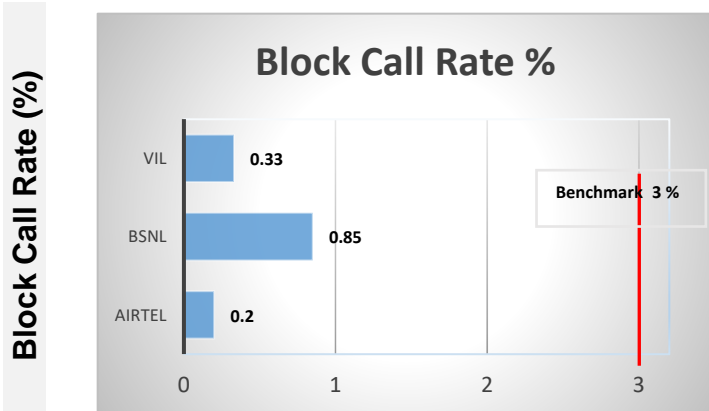| |
|---|
| 1. Madhugiri KSRTC Bus Stand |
| 2. Kunigal Railway station |
| 3. Kunigal Civil Bus stand |
| 4. General Hospital Tumkur |
| 5. KSRTC Bus Station Tumkur |
| 6. Railway Station Tumkur |
| 7. MG Stadium Tumkur |

Voice Calls

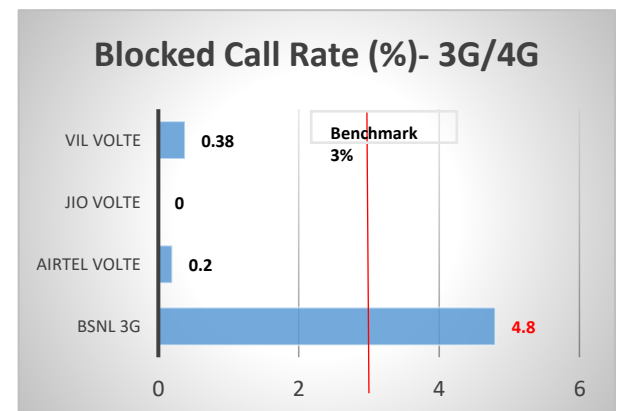QoS compliance of the TSPs in Kolar for Voice across technologies 2G/3G/4G-VoLTE:

Drop Call Rate %

Drop Call Rate (%)

	Value
VIL	0.17
BSNL	0
AIRTEL	0

Benchmark 2%

2G Network

Drop Call Rate (%)

	Value
VIL VOLTE	0.19
JIO VOLTE	0.17
AIRTEL VOLTE	0.2
BSNL 3G	0.5

Benchmark 2%

3G/VoLTE Network

Block Call Rate %

Block Call Rate (%)

	Value
VIL	0.33
BSNL	0.85
AIRTEL	0.2

Benchmark 3 %

2G Network

Blocked Call Rate (%)- 3G/4G

	Value
VIL VOLTE	0.38
JIO VOLTE	0
AIRTEL VOLTE	0.2
BSNL 3G	4.8
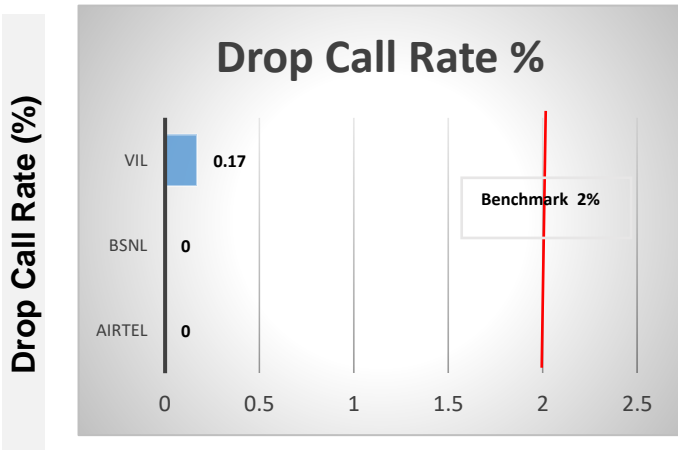
Benchmark 3%

3G/VoLTE Network

KPIs	2G			3G	VoLTE		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0	0	0.17	0.5	0.20	0.17	0.19
Block Call Rate %	0.20	0.85	0.33	4.8	0.20	0	0.38

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 except BSNL 3G.

Voice Calls

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage %	84.94	90.1	86.48

b) Percentage of coverage samples for 3G ≥ -90 dBm & LTE ≥ -110 dBm.

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Coverage %	93.3	97.75	97.3	95.01

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

TSPs	3G	VoLTE		
	BSNL	Airtel	JIO	VIL
Time Spent on 3G/4G %	90.4	100	100	99.85

Data Services Static

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

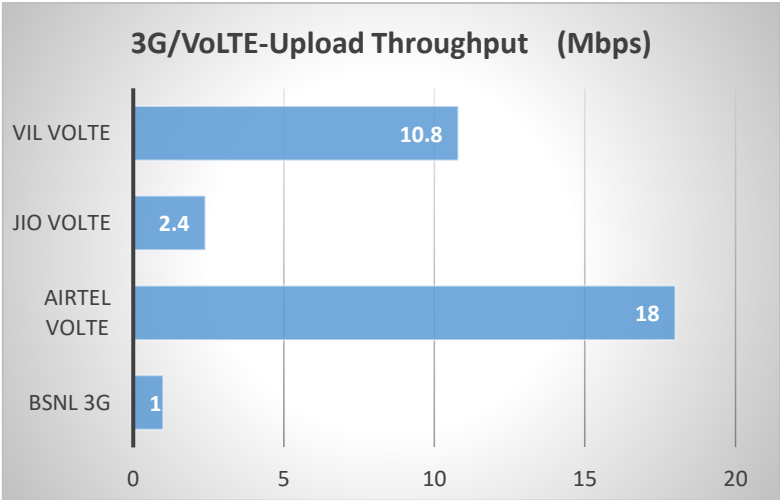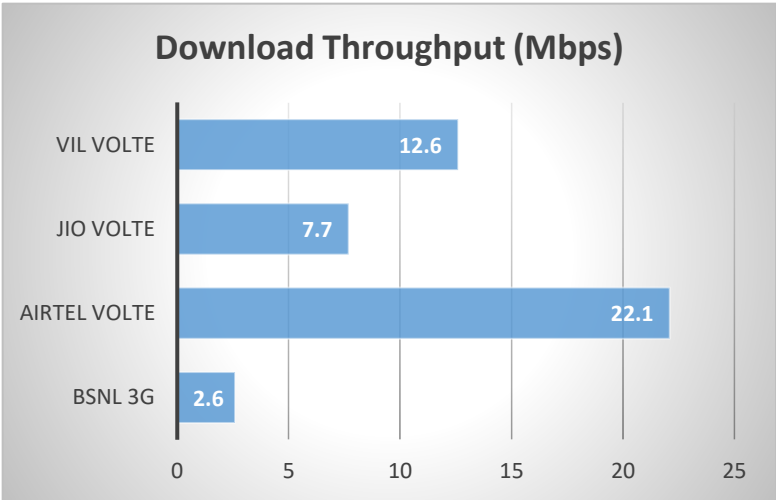## Data Download and Upload Performance (Mbps)

3G/4G/ Network:

Download Throughput (in Mbps)

VIL VOLTE	39.8
JIO VOLTE	4.7
AIRTEL VOLTE	12.7
BSNL 3G	3.1

(x-axis: 0, 20, 40, 60)

UPload Throughput (in Mbps)

VIL VOLTE	19.3
JIO VOLTE	2.5
AIRTEL VOLTE	6.8
BSNL 3G	1.1

(x-axis: 0, 10, 20, 30)

Latency (ms)

Latency (in ms)

VIL VOLTE	63
JIO VOLTE	50
AIRTEL VOLTE	93
BSNL 3G	100

(x-axis: 0, 50, 100, 150)

Web Browsing (Sec)

Web Browsing (sec)

VIL VOLTE	2.2
JIO VOLTE	3.8
AIRTEL VOLTE	4.9
BSNL 3G	9.5

(x-axis: 0, 2, 4, 6, 8, 10)
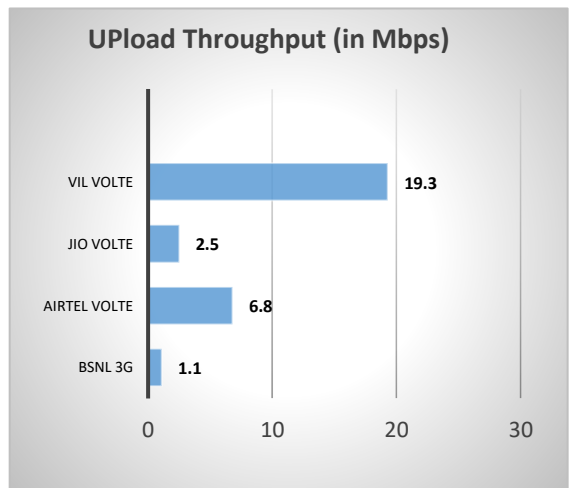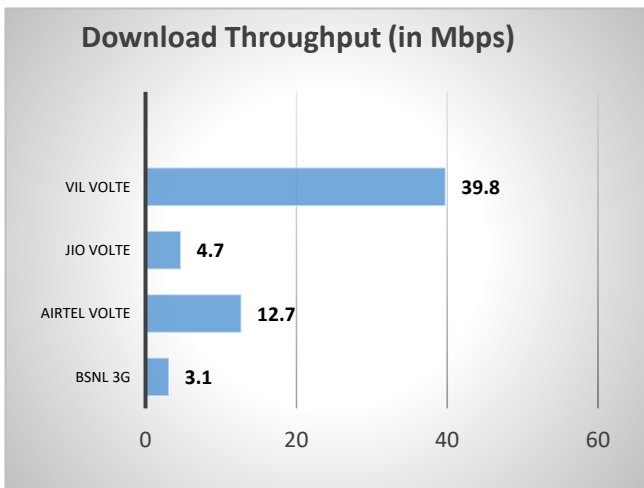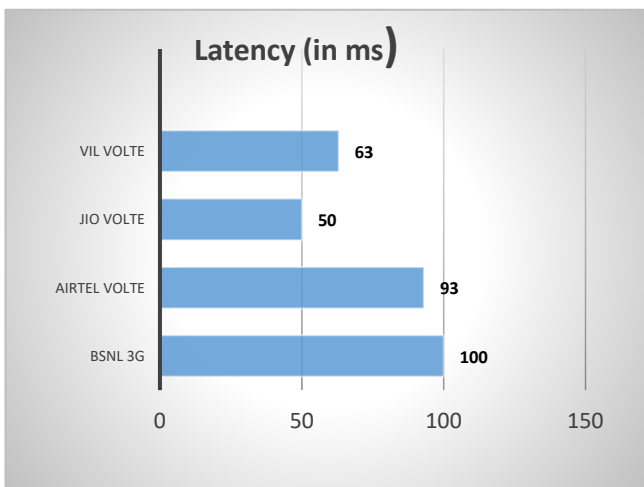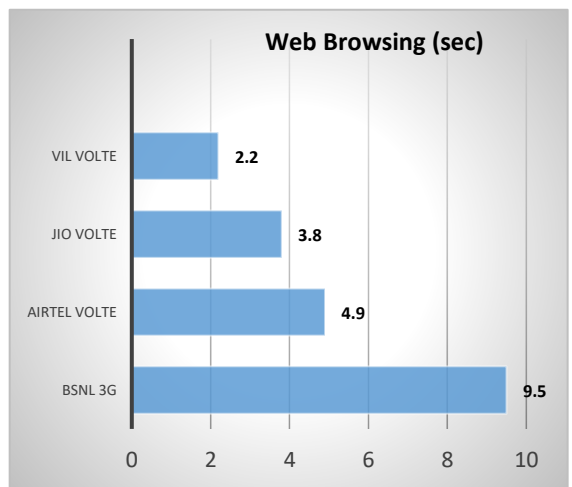
Data Download and Upload Performance (Mbps)

3G/VoLTE Network

Download Throughput (Mbps)

Network	Value
VIL VOLTE	12.6
JIO VOLTE	7.7
AIRTEL VOLTE	22.1
BSNL 3G	2.6

(X-axis: 0, 5, 10, 15, 20, 25)

3G/VoLTE-Upload Throughput (Mbps)

Network	Value
VIL VOLTE	10.8
JIO VOLTE	2.4
AIRTEL VOLTE	18
BSNL 3G	1

(X-axis: 0, 5, 10, 15, 20)

Summary

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Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	485	473	591
Blocked Call Rate (%)	0.20	0.85	0.33
CSSR% (Accessibility)	99.79	99.15	99.66
Drop Call Rate (%)	0	0	0.17
Mobility HOSR (%)	99.6	96.52	99.7
Rx Quality (%)	92.79	90.9	96.63

Voice Call	3G/4G			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Call Attempt	462	499	580	515
Blocked Call Rate (%)	4.8	0.20	0	0.38
CSSR% (Accessibility)	95.2	99.80	100	99.61
Drop Call Rate (%)	0.5	0.20	0.17	0.19
Mobility HOSR (%)	100	99.89	98.86	99.88
Rx Quality (%)	95.25	82.56	90.45	96.78

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 except BSNL 3G.

c) Rx Quality is less than 95% for all TSPs except BSNL 3G, VIL 2G & VIL VoLTE

Summary

Data Services Static	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	140.3	125.6	240.2
Upload Throughput (kbps)	5.7	72.8	143.3
Web Browsing Delay (sec)	64.8	35.1	6.4
Latency (msec)	252	1166	174

Data Services Static	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Download Throughput (Mbps)	3.1	12.7	4.7	39.8
Upload Throughput (Mbps)	1.1	6.8	2.5	19.3
Web Browsing Delay (sec)	9.5	4.9	3.8	2.2
Video Streaming Delay (sec)	Not captured	1.5	0	1.3
Latency (ms)	100	93	50	63

Data Services Dynamic	3G/VoLTE			
	BSNL 3G	Airtel VoLTE	JIO VoLTE	VIL VoLTE
Download Throughput (Mbps)	2.6	22.1	7.7	12.6
Upload Throughput (Mbps)	1.0	18.0	2.4	10.8

Summary

Data Services Static – Madhugiri KSRTC Bus Stand	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	134.72	37.7	259.2
Upload Throughput (kbps)	7.11	18.3	113.2
Web Browsing Delay (sec)	73.51	50.4	6.2
Latency (ms)	265	2582	105

Data Services Static – Madhugiri KSRTC Bus Stand	3G	VoLTE		
	BSNL 3G	Airtel	JIO	VIL
Download Throughput (Mbps)	2.0	10.12	2.03	51.8
Upload Throughput (Mbps)	1.0	10.87	1.18	21.2
Web Browsing Delay (sec)	12.4	6.11	4.13	2.4
Video Streaming Delay (sec)	Not Captured	0.87	0	1.4
Latency (ms)	122	60	51	59

Data Services Static – Kunigal Railway Station	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	137.49	2G Sites not available	240.6
Upload Throughput (kbps)	3.94		164
Web Browsing Delay (sec)	42.74		6.4
Latency (msec)	232		156

Data Services Static – Kunigal Railway Station	3G	VoLTE		
	BSNL 3G	Airtel	JIO	VIL
Download Throughput (Mbps)	2.7	10.12	7.08	58.6
Upload Throughput (Mbps)	1.0	1.61	3.91	19
Web Browsing Delay (sec)	10.6	3.84	3.6	2.2
Video Streaming Delay (sec)	Not Captured	1.07	0	1.2
Latency (ms)	89	81	47	61

Summary

Data Services Static –Kunigal Civil Bus Stand	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	140.69	143	295.6
Upload Throughput (kbps)	8.20	97.8	202.6
Web Browsing Delay (sec)	38.66	23.8	6.6
Latency (ms)	232	319	167

Data Services Static – Kunigal Civil Bus Stand	3G	VoLTE		
	BSNL 3G	Airtel	JIO	VIL
Download Throughput (Mbps)	2.4	14.06	5.43	58.2
Upload Throughput (Mbps)	1.1	5.53	3.89	25.4
Web Browsing Delay (sec)	7.6	4.49	3.14	2.2
Video Streaming Delay (sec)	Not Captured	1.48	0	1.2
Latency (ms)	109	92	46	79

Data Services Static – General Hospital Tumkur	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	144.73	139.3	213
Upload Throughput (kbps)	8.16	42.1	137.8
Web Browsing Delay (sec)	72.63	37.6	6
Latency (msec)	251	780	203

Data Services Static- General Hospital Tumkur	3G	VoLTE		
	BSNL 3G	Airtel	JIO	VIL
Download Throughput (Mbps)	4	4.56	5.12	40.6
Upload Throughput (Mbps)	1.1	1.36	3.49	24.6
Web Browsing Delay (sec)	6.8	4.36	3.95	2
Video Streaming Delay (sec)	Not captured	2.44	0	1
Latency (ms)	103	211	47	62

Summary

Data Services Static- KSRTC Bus Stand Tumkur	2G		
	Airtel	**BSNL**	**VIL**
Download Throughput (kbps)	97.87	150.5	262.2
Upload Throughput (kbps)	2.49	99.4	118.2
Web Browsing Delay (sec)	70.65	34.6	6.8
Latency (ms)	260	1031	197

Data Services Static- KSRTC Bus Stand Tumkur	3G	VoLTE		
	BSNL 3G	**Airtel**	**JIO**	**VIL**
Download Throughput (Mbps)	3.7	30.63	3.21	33.4
Upload Throughput (Mbps)	1.0	20.37	1.48	26.8
Web Browsing Delay (sec)	11.6	6.18	4.35	2
Video Streaming Delay (sec)	Not captured	1.38	0	1
Latency (ms)	110	62	54	64

Data Services Static – Railway Station Tumkur	2G		
	Airtel	**BSNL**	**VIL**
Download Throughput (kbps)	150.63	144.9	204.8
Upload Throughput (kbps)	5.83	88.1	124
Web Browsing Delay (sec)	128.31	45.6	6
Latency (msec)	262	605	200

Data Services Static – Railway Station Tumkur	3G	VoLTE		
	BSNL 3G	**Airtel**	**JIO**	**VIL**
Download Throughput (Mbps)	3.6	11.79	5.52	17
Upload Throughput (Mbps)	1.4	3.15	1.51	11
Web Browsing Delay (sec)	9.2	3.71	3.7	2.4
Video Streaming Delay (sec)	Not captured	1.05	0	1.6
Latency (ms)	90	92	53	62

Summary

Data Services Static- MG Stadium Tumkur	2G		
	Airtel	BSNL	VIL
Download Throughput (kbps)	175.69	138.4	205.8
Upload Throughput (kbps)	3.99	90.9	143
Web Browsing Delay (sec)	27.26	18.8	6.6
Latency (ms)	263	1678	191

Data Services Static- MG Stadium Tumkur	3G	VoLTE		
	BSNL 3G	Airtel	JIO	VIL
Download Throughput (Mbps)	3.5	7.61	4.62	19.2
Upload Throughput (Mbps)	1.2	4.97	1.97	7.2
Web Browsing Delay (sec)	8.4	5.90	3.53	2
Video Streaming Delay (sec)	Not captured	2.22	0	1.6
Latency (ms)	77	56	55	54

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	84.94
BSNl 2G	90.1
VIL 2G	86.48
BSNL 3G	93.3
Airtel VoLTE	97.75
Jio VoLTE	97.3
VIL VoLTE	95.01

Coverage Distribution (%)

Legend:
- 2G:[Max, >=-75] 3G:Max, >=-70 VoLTE: >=80
- 2G:[-75, >=-85] 3G:[-70,>=-80] VoLTE:[-80,>=-90]
- 2G:[-85, >=-95) 3G:[-80,>=-90] VoLTE:[-90,>-=-110]
- 2G:[-95, >=Min] 3G:[[-90,>=Min] VoLTE:[[-110,>=Min]
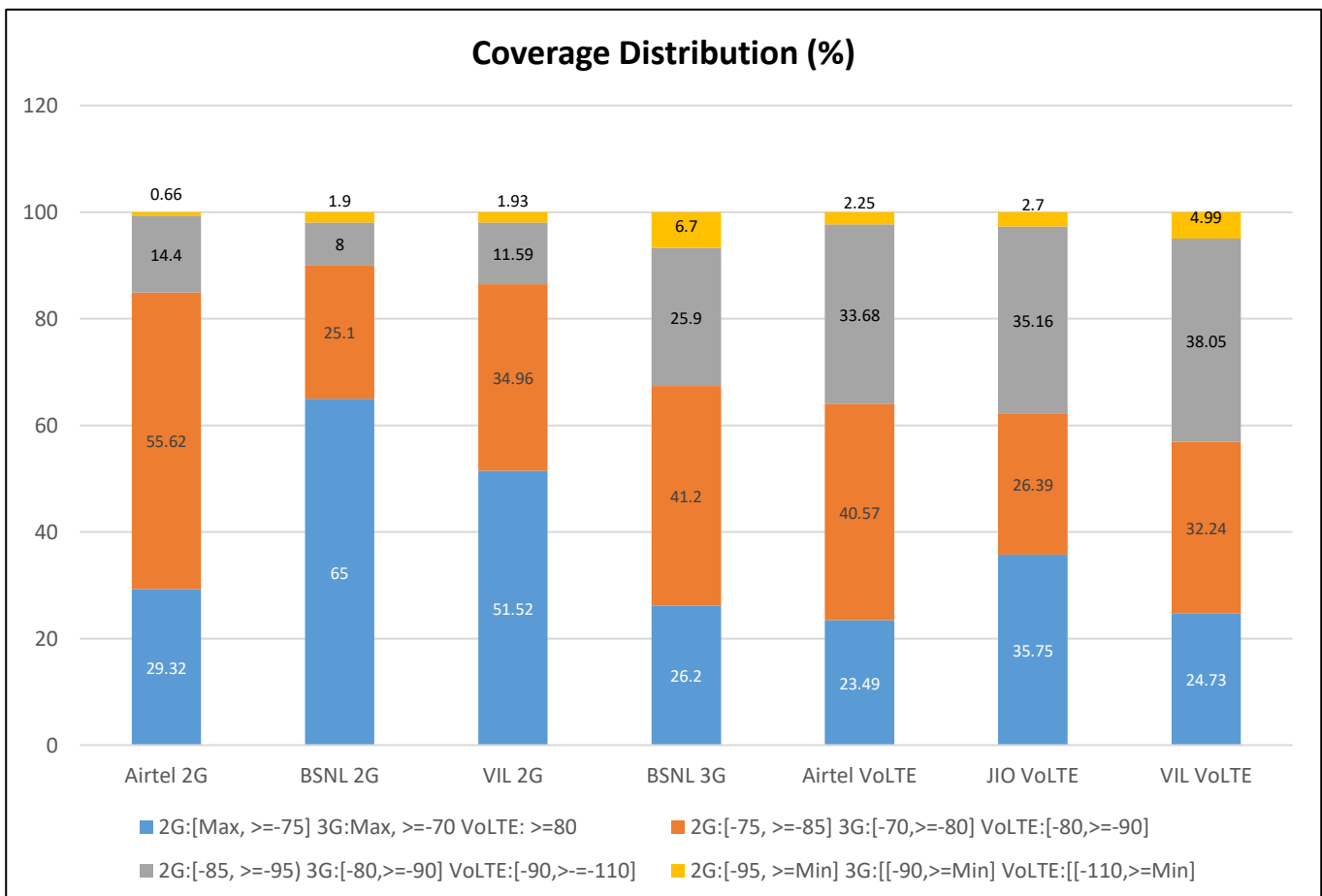
AIRTEL

Technology	Coverage Rate %
2G	84.94
VoLTE	97.75

2G	**VoLTE**
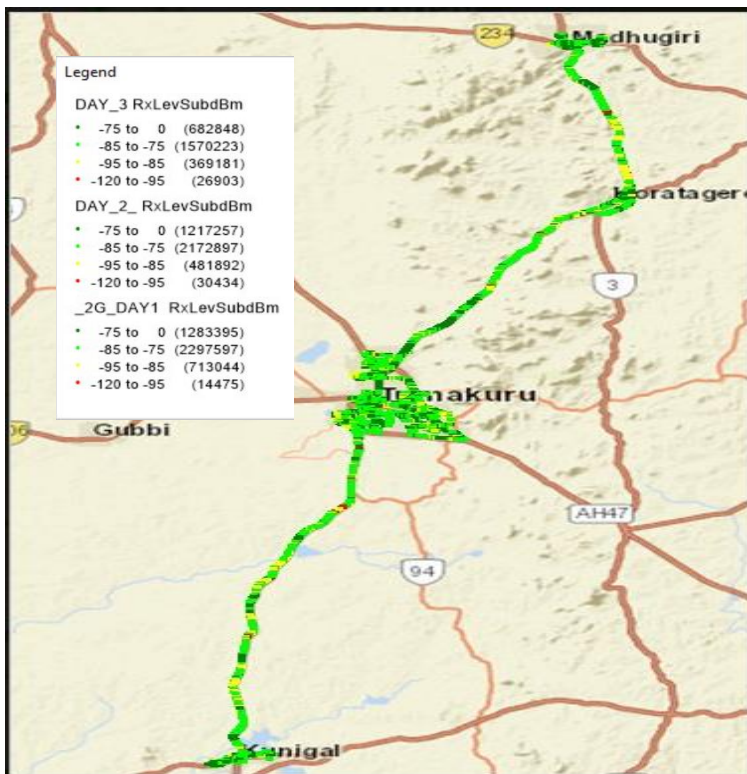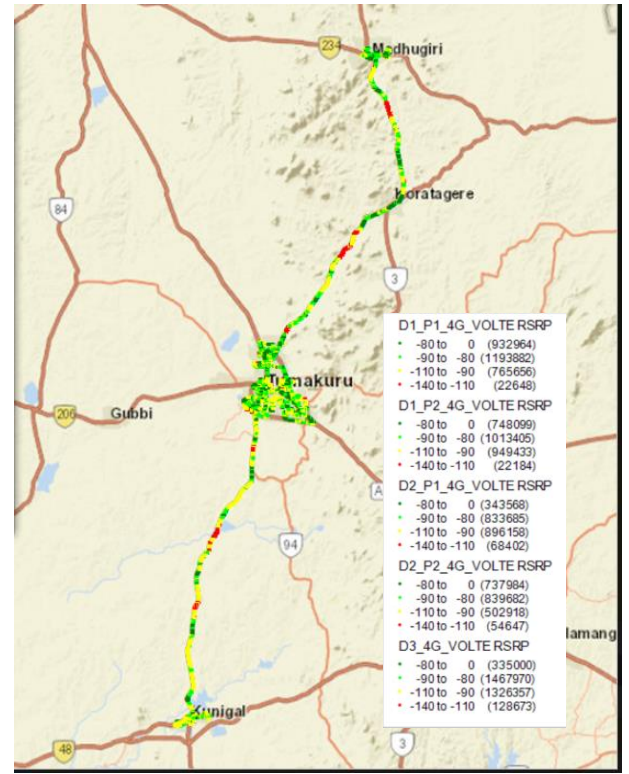
2G		
Overall RxLevel	**# Samples**	**%**
[Max, >=-75]	3183500	29.32
[-75, >=-85)	6040717	55.62
[-85, >=-95)	1564117	14.40
[-95, >=Min)	71812	0.66
Total	**10860146**	**100**

VoLTE		
Overall RSRP	**# Samples**	**%**
[Max, >=-80]	3097615	23.49
[-80, >=-90)	5348624	40.57
[-90, >=-110)	4440522	33.68
[-110, >=Min)	296554	2.25
Total	13183315	**100**

BSNL

Technology	Coverage Rate %
2G	90.1
3G	93.3

2G
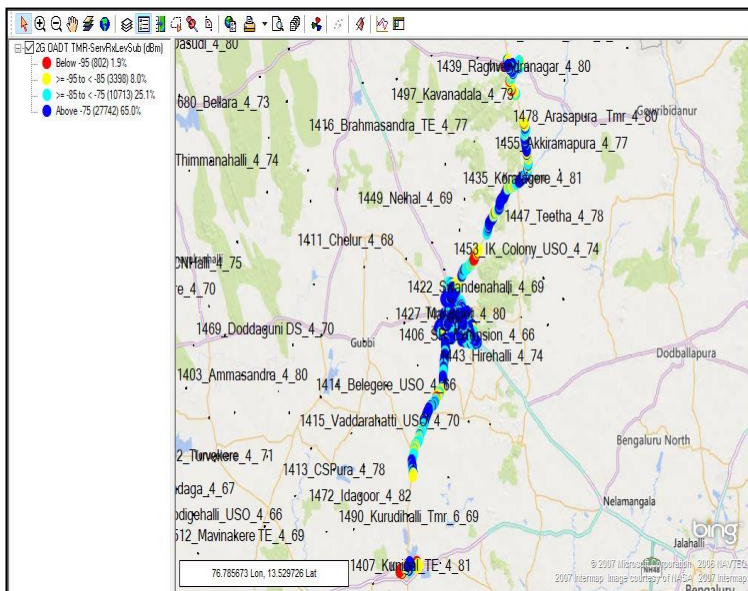
3G

2G
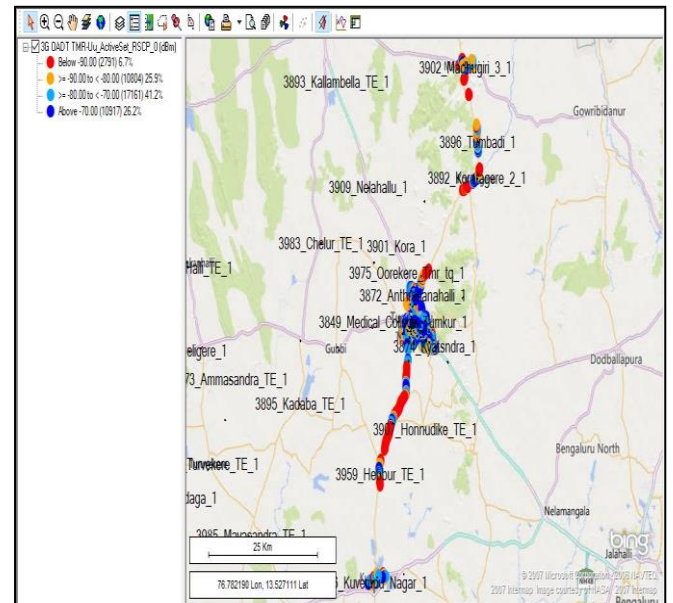
Overall RxLevel	# Samples	%
[Max, >=-75]	27742	65
[-75, >=-85)	10713	25.1
[-85, >=-95)	3398	8
[-95, >=Min)	802	1.9
Total	**42655**	**100**

3G

Overall RSCP	# Samples	%
[Max, >=-70]	10917	26.2
[-70, >=-80)	17161	41.2
[-80, >=-90)	10804	25.9
[-90, >=Min)	2791	6.7
Total	**41673**	**100**

JIO

Technology	Coverage Rate %
VoLTE	97.3
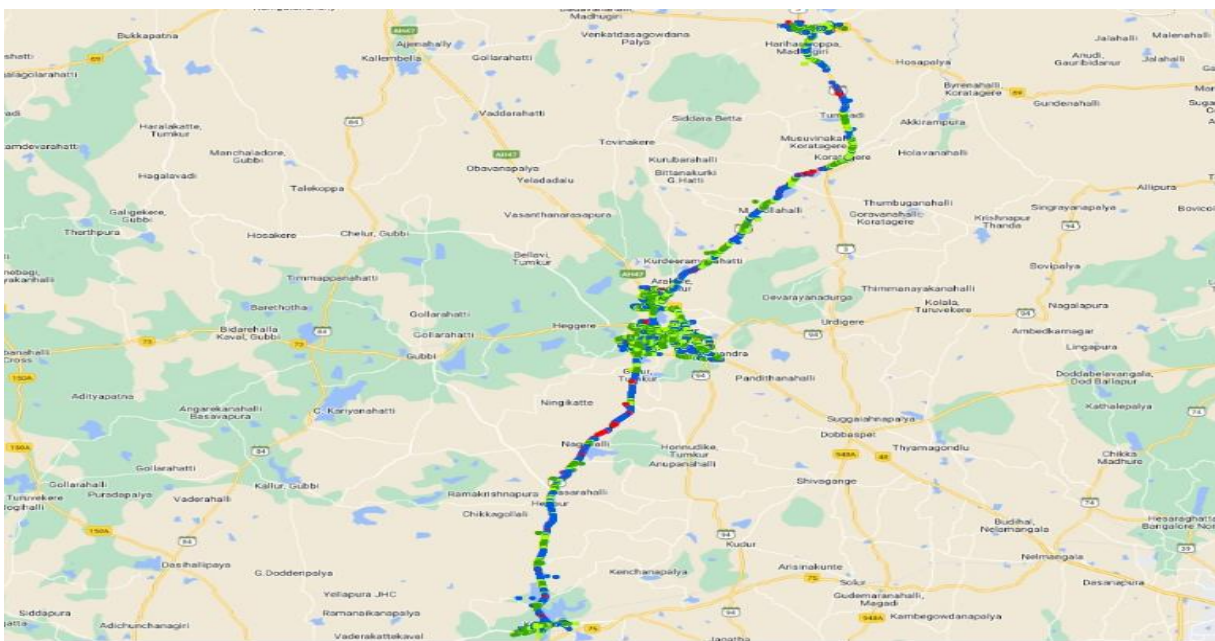
4G/VoLTE		
Overall RSRP	**# Samples**	**%**
[Max, >=-80]	22252	35.75
[-80, >=-90)	16425	26.39
[-90, >=-110)	21883	35.16
[-110, >=Min)	1683	2.70
Total	**62243**	**100**

VIL

Technology	Coverage Rate %
2G	86.48
VoLTE	95.01

2G	**VoLTE**
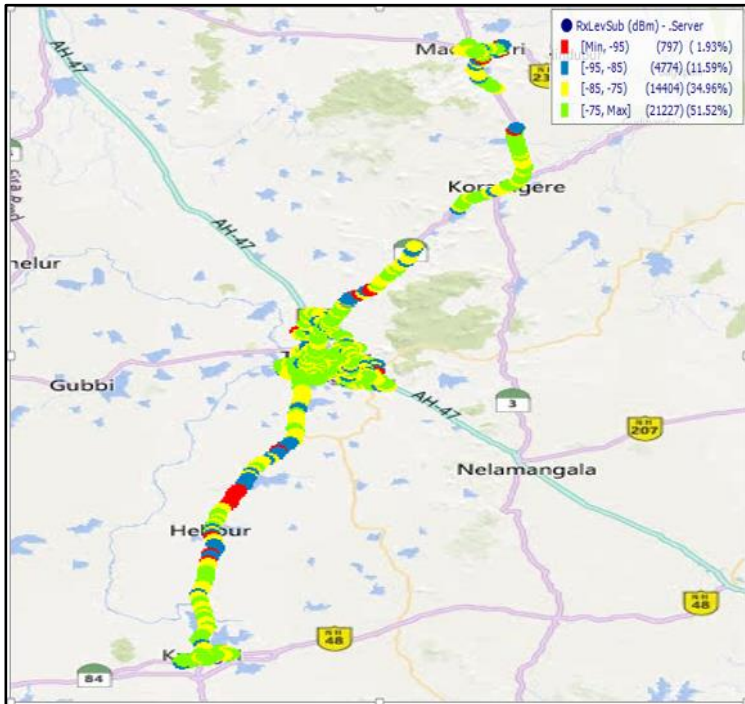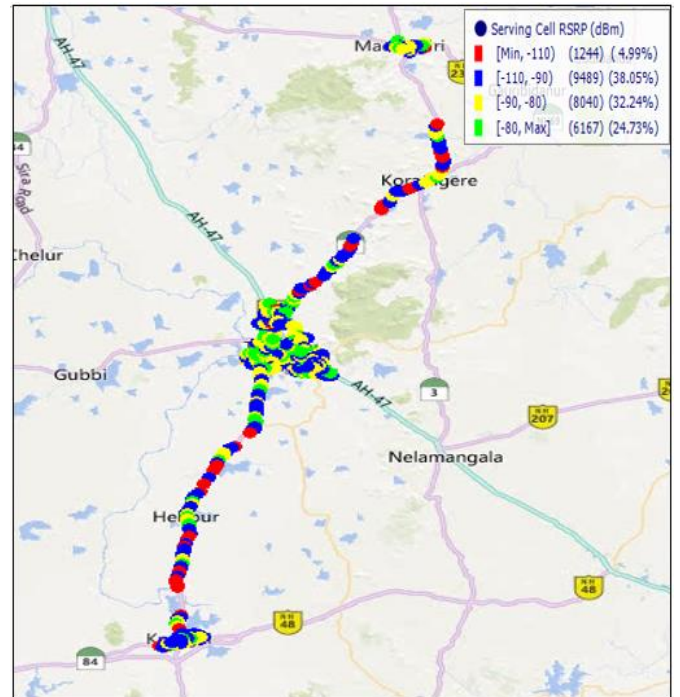
2G		
Overall RxLevel	**# Samples**	**%**
[Max, >=-75]	21227	51.52
[-75, >=-85)	14404	34.96
[-85, >=-95)	4774	11.59
[-95, >=Min)	797	1.93
Total	**41202**	**100**

4G/VoLTE		
Overall RSRP	**# Samples**	**%**
[Max, >=-80]	6167	24.73
[-80, >=-90)	8040	32.24
[-90, >=-110)	9489	38.05
[-110, >=Min)	1244	4.99
Total	**24940**	**100**

For measuring voice quality, as per the QoS norms, Rx Qual <=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	92.80
BSNl 2G	90.9
VIL 2G	96.63
BSNL 3G	95.25
Airtel VoLTE	82.56
Jio VoLTE	90.45
VIL VoLTE	96.78

Rx Quality Distribution

TSP	Rx Quality 2G:[<=5] 3G:[EcNo>=-14 dBm] VoLTE:[SINR>0]	Rx Quality 2G:[>5] 3G:[EcNo<-14 dBm] VoLTE:[SINR<=0]
Airtel 2G	92.8	7.20
BSNl 2G	90.9	9.10
VIL 2G	96.63	3.37
BSNL 3G	95.25	4.75
Airtel VoLTE	82.56	17.44
Jio VoLTE	90.45	9.55
VIL VoLTE	96.78	3.22
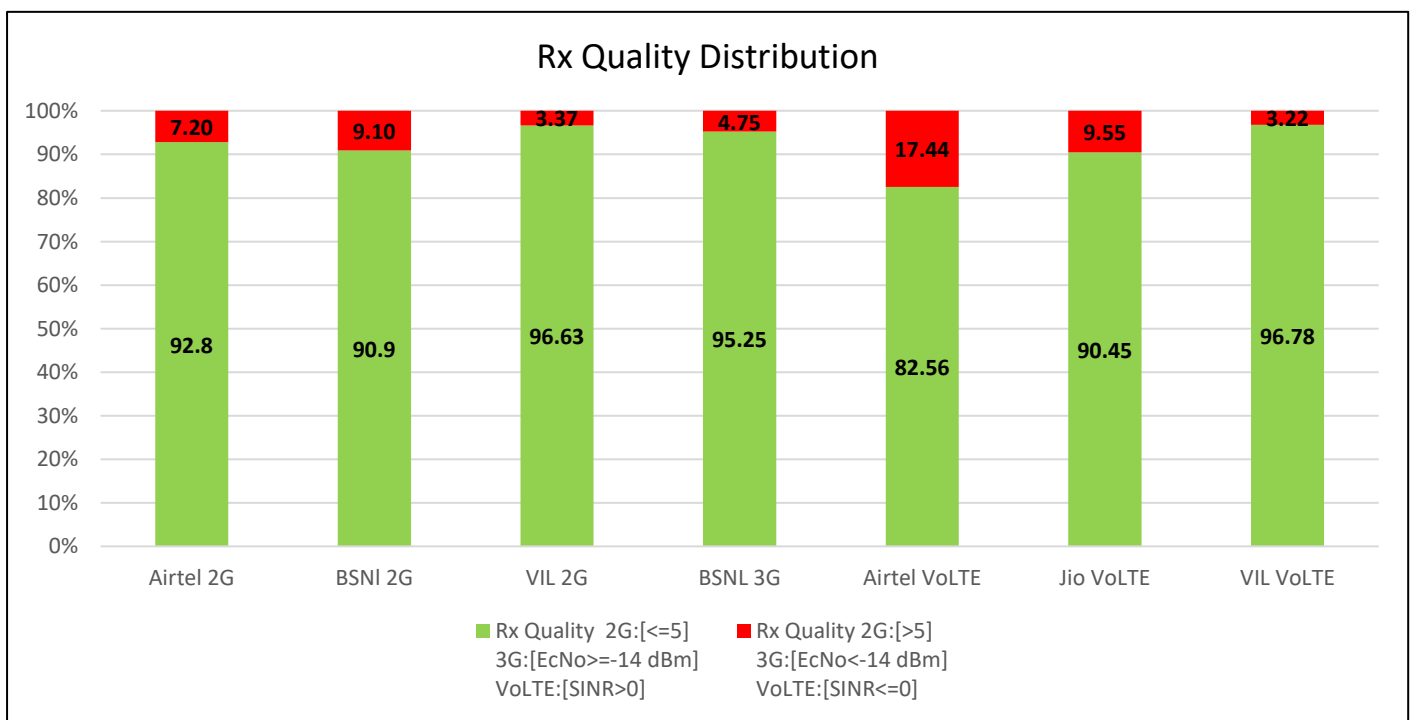
Airtel

Technology	Rx Quality %
2G	92.80
VoLTE	82.56

2G
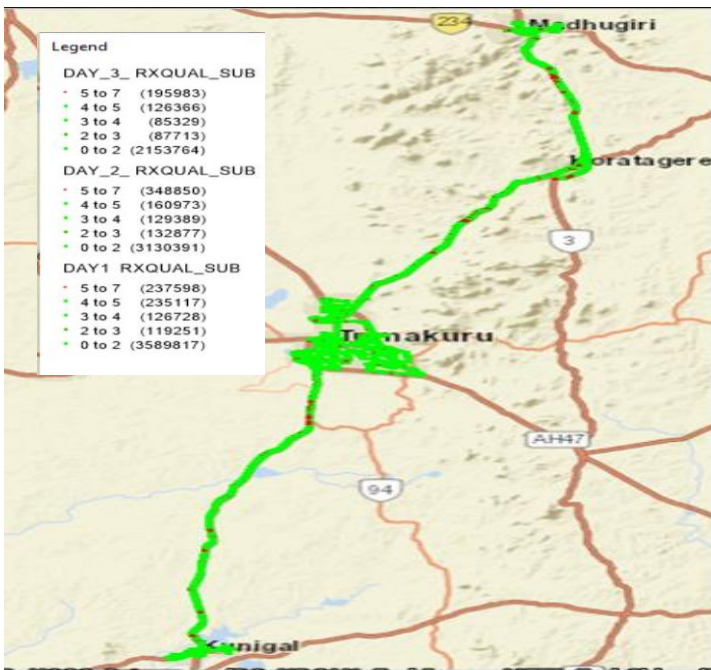
VoLTE
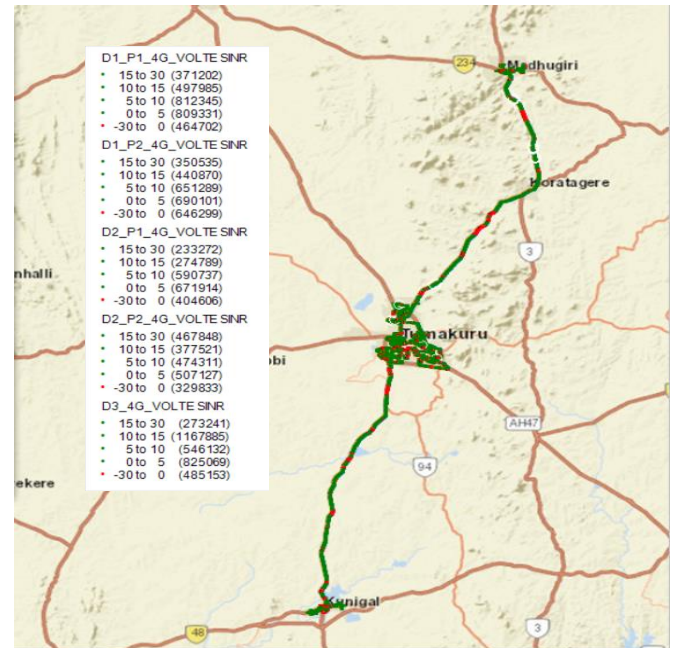
Overall Rx Quality	# Samples	%
(Min, <=2)	8873972	81.71
(2, <=3)	339841	3.13
(3 , <=4)	341446	3.14
(4 , <=5)	522456	4.82
(5 , <=Max)	782431	7.20
Total	10860146	100

Overall SINR	# Samples	%
(Min, <=0)	2330593.00	17.44
(0, <=5)	3503542	26.22
(5, <=10)	3074814	23.00
(10, <=15)	2759050	20.65
(15, <=Max)	1696098	12.69
Total	13364097.00	100

BSNL

Technology	Rx Quality %
2G	90.9
3G	95.25

2G

3G
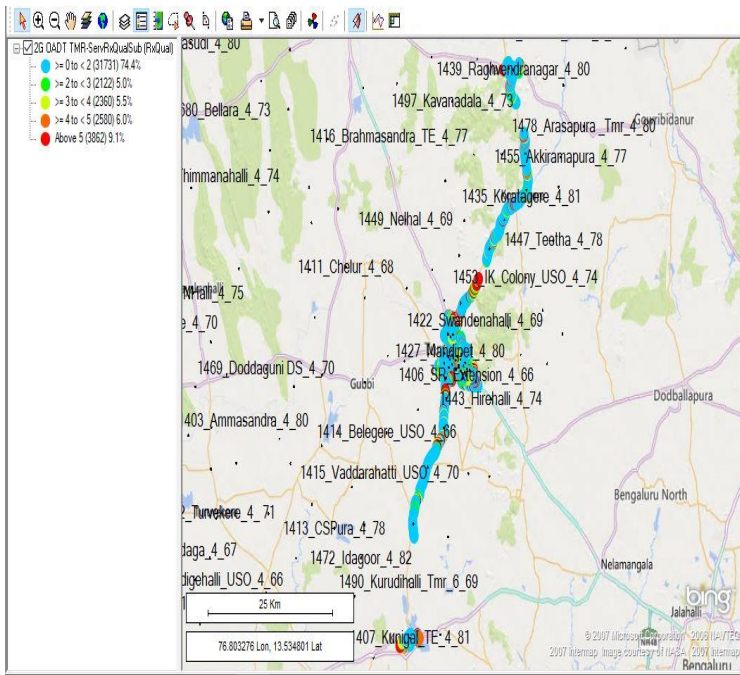
Overall Rx Quality	# Samples	%
(Min, <=2)	31731	74.4
(2, <=3)	2122	5
(3 , <=4)	2360	5.5
(4 , <=5)	2580	6
(5 , <=Max)	3862	9.1
Total	**42655**	**100**
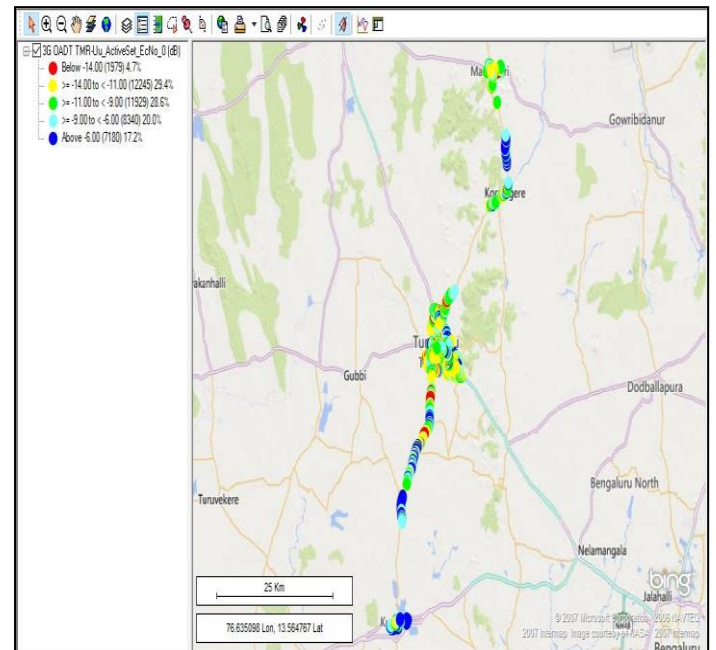
Overall EcNo	# Samples	%
(Max, <=-6)	7180	17.2
(-6, <=-9)	8340	20
(-9, <=-11)	11929	28.6
(-11, <=-14)	12245	29.4
(-14, <= Min)	1979	4.7
Total	**41673**	**100**

JIO

Technology	Rx Quality %
VoLTE	**90.45**
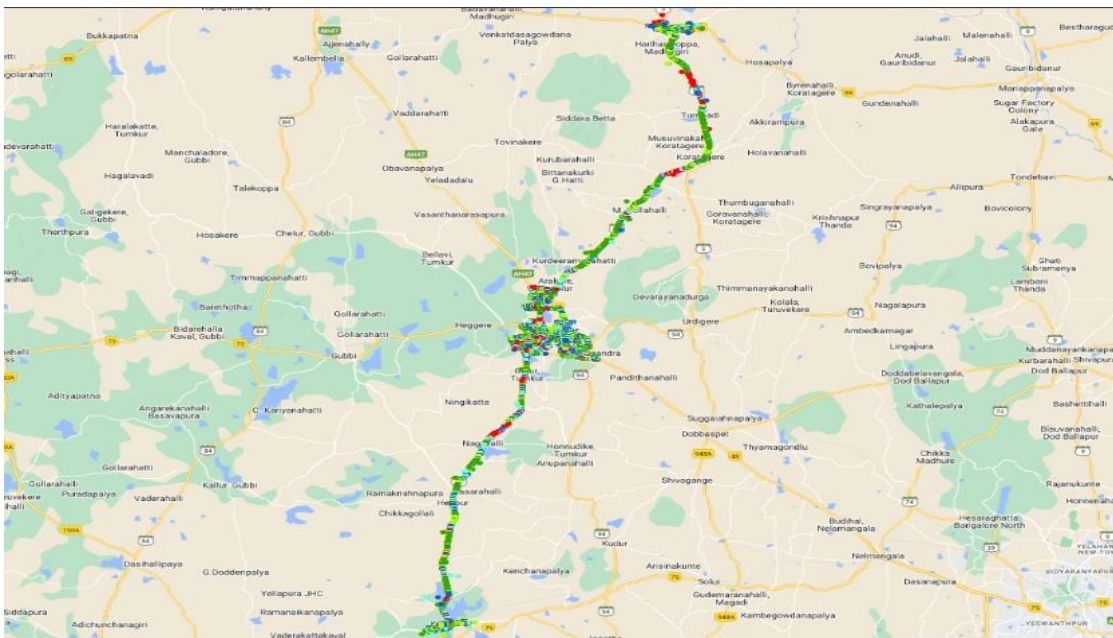
Overall SINR	# Samples	%
(Min, <=0)	5946	9.55
(0, <=5)	9985	16.04
(5, <=10)	13136	21.10
(10, <=15)	12888	**20.71**
(15, <=Max)	20288	32.59
Total	**62243**	**100**

VIL

Technology	Rx Quality %
2G	96.63
VoLTE	96.78

2G	VoLTE
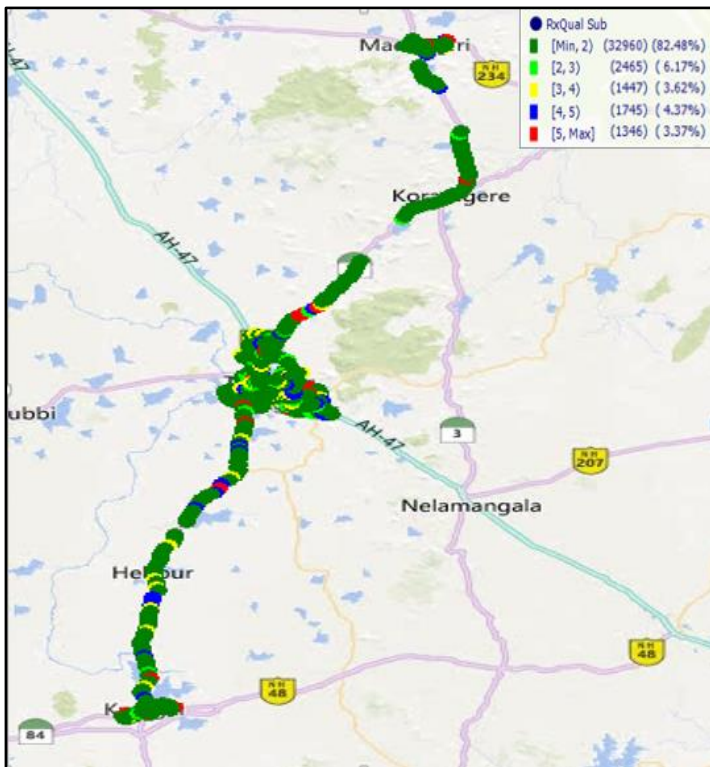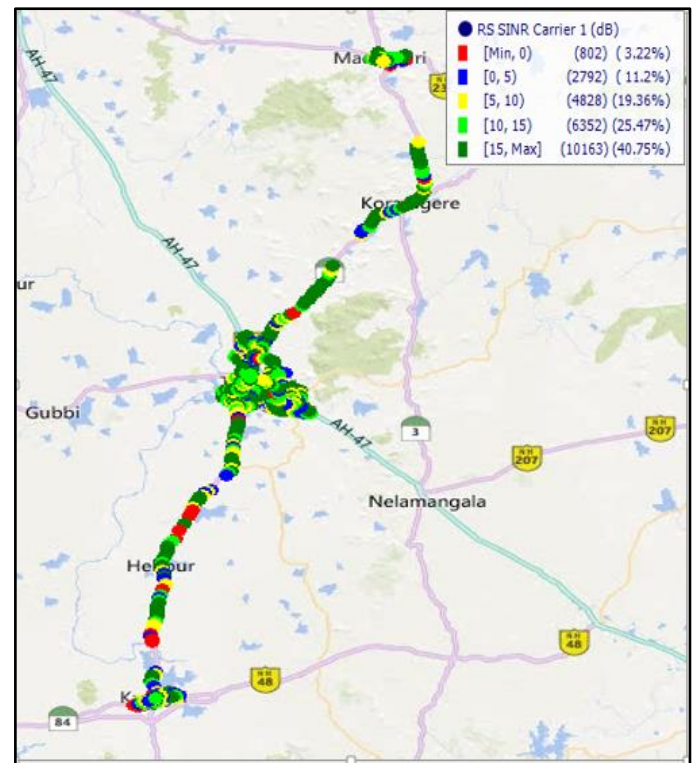
Overall Rx Quality	# Samples	%	Overall SINR	# Samples	%
(Min, <=2)	32960	82.48	(Min, <=0)	802	3.22
(2, <=3)	2465	6.17	(0, <=5)	2792	11.2
(3 , <=4)	1447	3.62	(5, <=10)	4828	19.36
(4 , <=5)	1745	4.37	(10, <=15)	6352	25.47
(5 , <=Max)	1346	3.37	(15, <=Max)	10163	40.75
Total	**39963**	**100**	**Total**	**24937**	**100**

Service Provider	% of Time Spent on 3G/VoLTE
BSNL 3G	90.4
Airtel VoLTE	100
Jio VoLTE	100
VIL VoLTE	99.85

Technology Distribution (%)

- % of Time Spent on 3G/VoLTE
- % of Time Spent on 2G
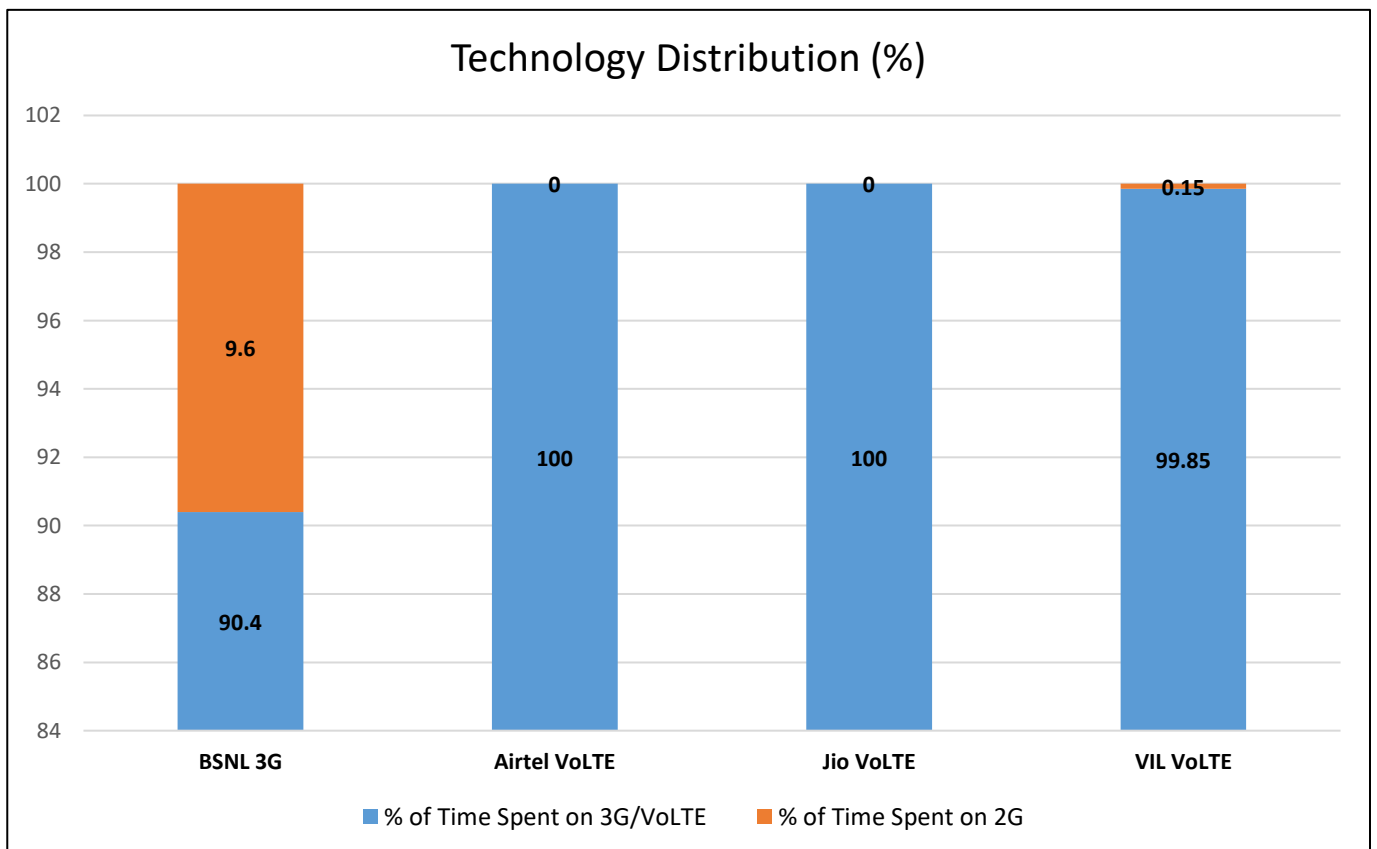
Airtel

Technology	Time Spent
VoLTE	100%
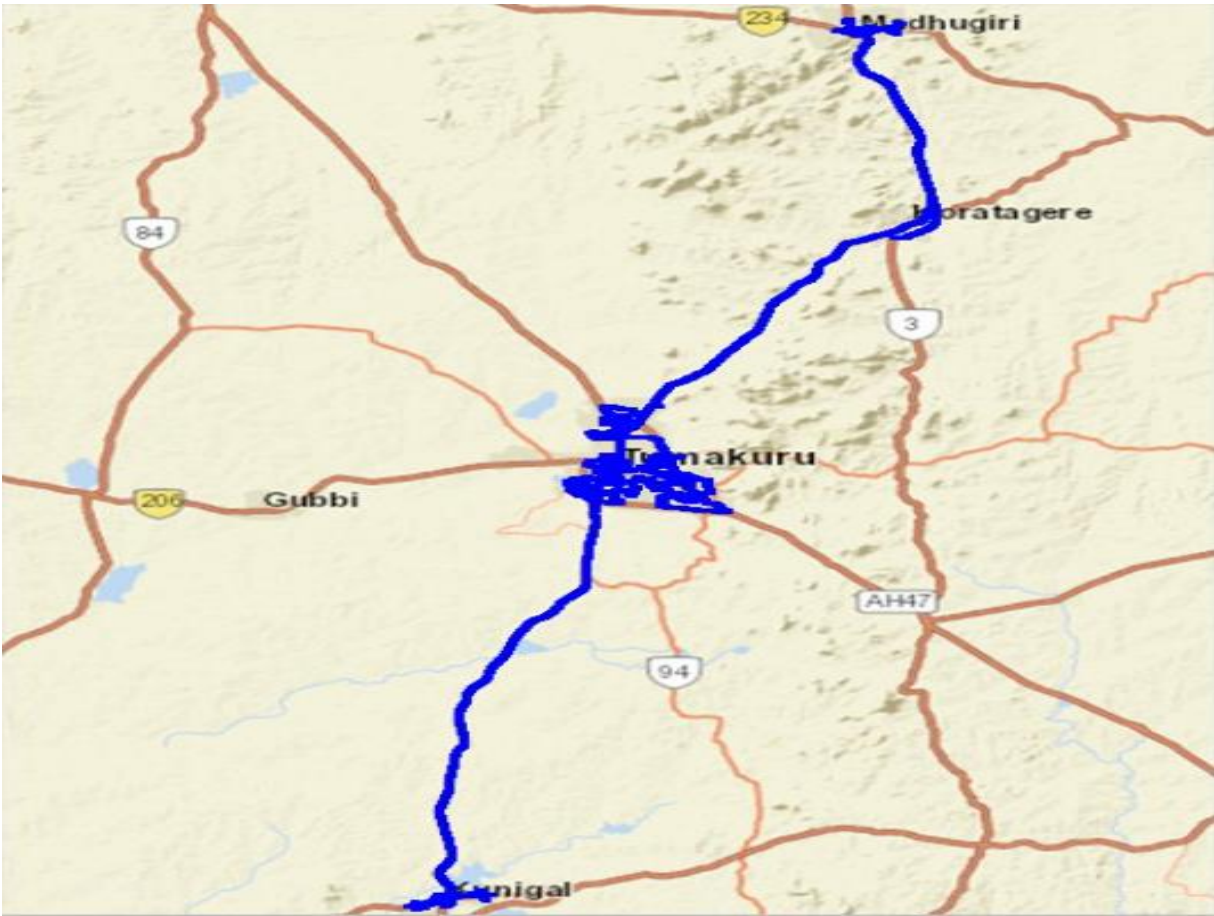
BSNL

Technology	Time Spent
3G	90.4 %
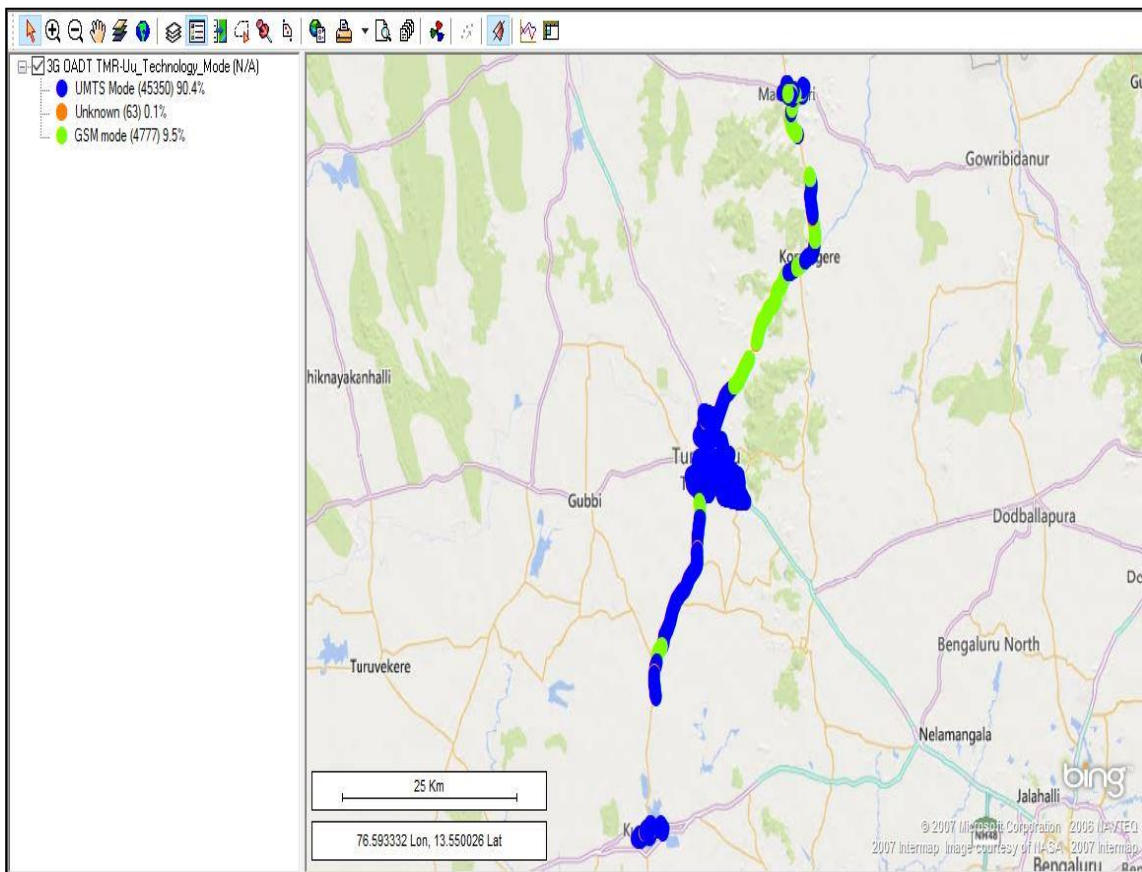
JIO

Technology	Time Spent
VoLTE	100 %
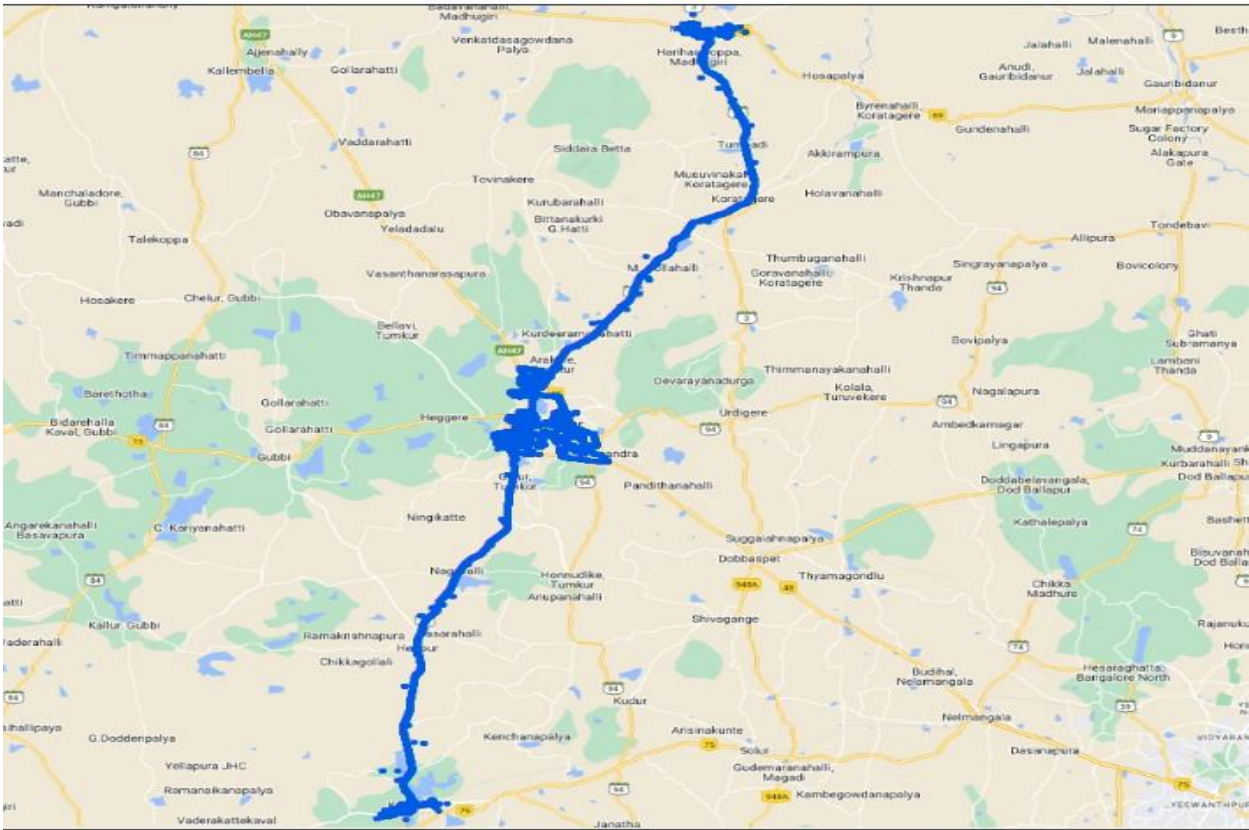
VIL

Technology	Time Spent
VoLTE	99.85 %
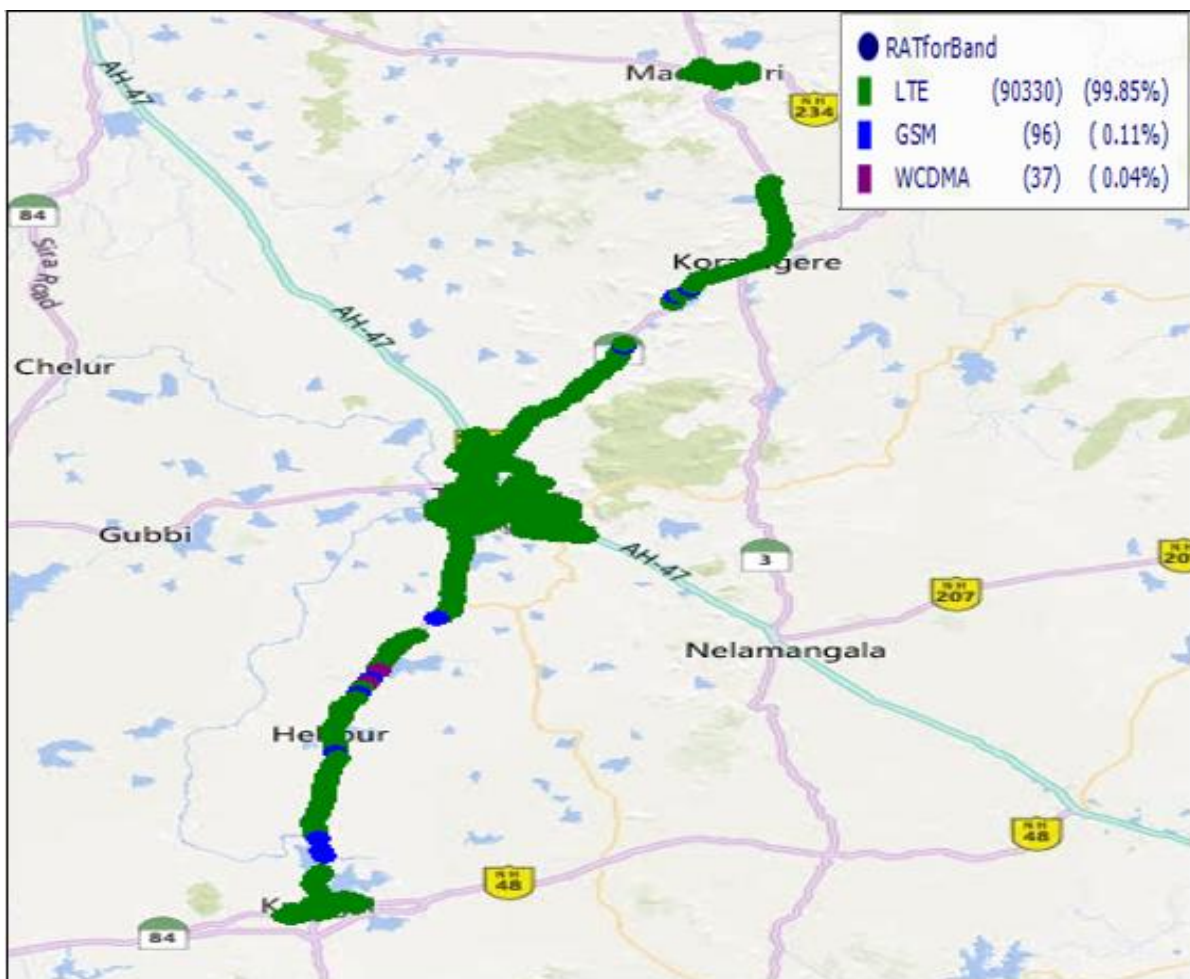
Airtel
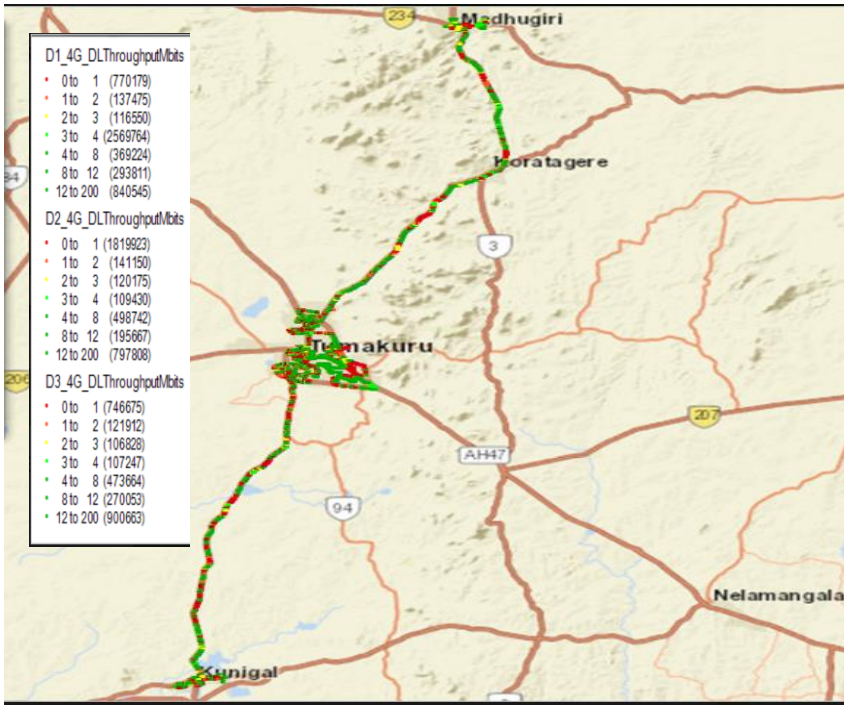
DL throughput	No. of Samples	%
0 to 1 Mbps	3336777	29.00
1 to 2 Mbps	400537	3.48
2 to 3 Mbps	343553	2.99
3 to 4 Mbps	2786441	24.21
4 to 8 Mbps	1341630	11.66
8 to 12 Mbps	759531	6.60
>12 Mbps	2539016	22.06
Total	11507485	100.00
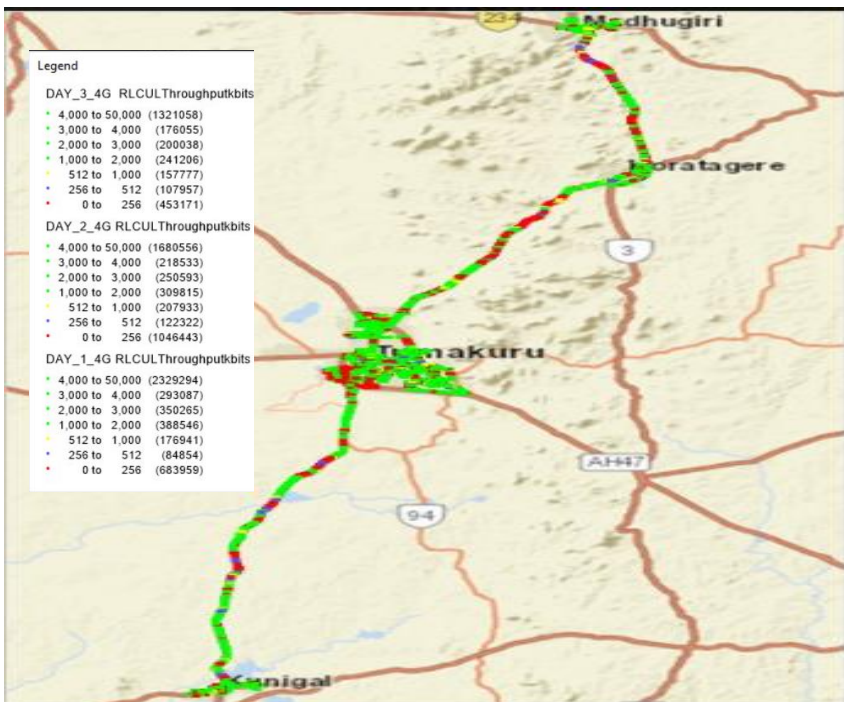
Upload throughput	No. of samples	%
0 to 256 Kbps	2183573	20.22
256 to 512 Kbps	315133	2.92
512 Kbps to 1 Mbps	542651	5.02
1 to 2 Mbps	939567	8.70
2 to 3 Mbps	800896	7.41
3 to 4 Mbps	687675	6.37
>4Mbps	5331008	49.36
Total	10800503	100

BSNL
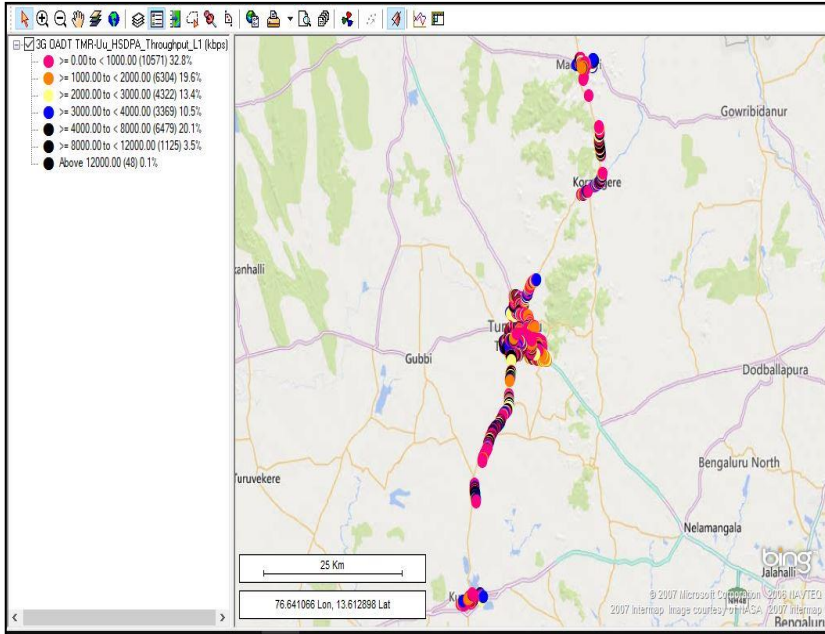
DL throughput	No. of Samples	%
0 to 1 Mbps	10571	32.8
1 to 2 Mbps	6304	19.6
2 to 3 Mbps	4322	13.4
3 to 4 Mbps	3369	10.5
4 to 8 Mbps	6479	20.1
8 to 12 Mbps	1125	3.5
>12 Mbps	48	0.1
Total	32218	100
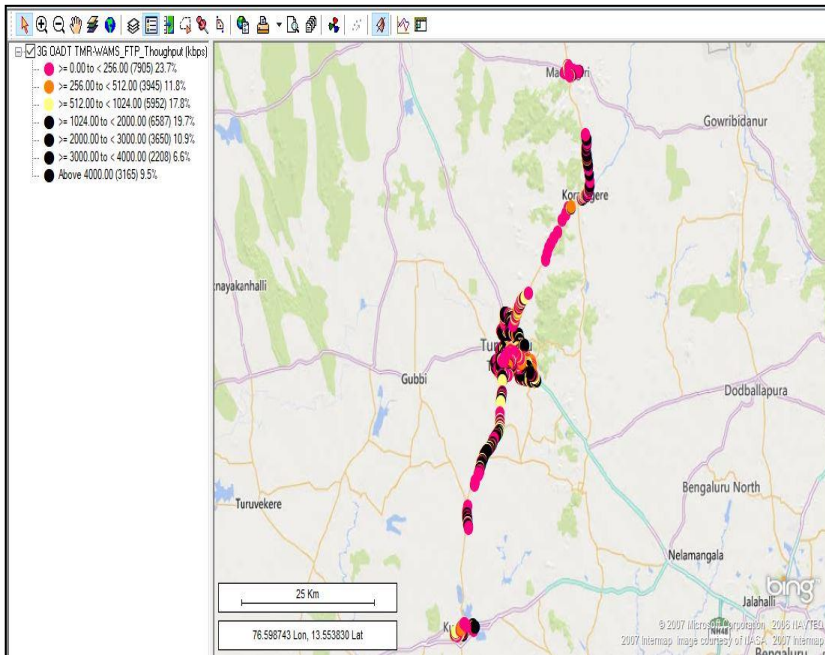
Upload throughput	No. of samples	%
0 to 256 kbps Mbps	7905	23.7
250 to 512 kbps	3945	11.8
512 Kbps to 1 Mbps	5952	17.8
1 to 2 Mbps	6587	19.7
2 to 3 Mbps	3650	10.9
3 to 4 Mbps	2208	6.6
>4Mbps	3165	9.5
Total	33412	100

JIO
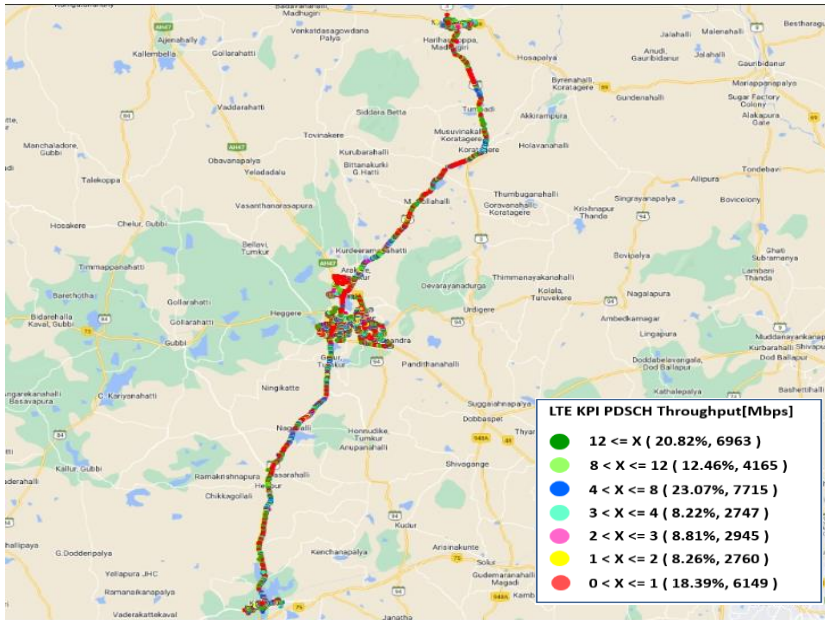
DL throughput	No. of Samples	%
0 to 1 Mbps	6149	18.39
1 to 2 Mbps	2760	8.26
2 to 3 Mbps	2945	8.81
3 to 4 Mbps	2747	8.22
4 to 8 Mbps	7715	23.07
8 to 12 Mbps	4165	12.46
>12 Mbps	6963	20.82
Total	33444	100
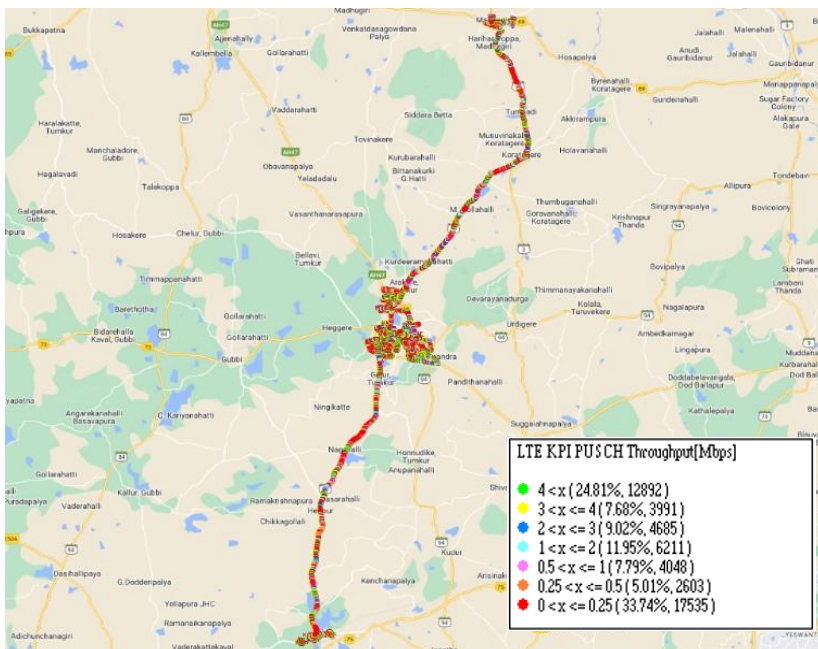
Upload throughput	No. of samples	%
0 to 256 kbps Mbps	17535	33.74
250 to 512 kbps	2603	5.01
512 Kbps to 1 Mbps	4048	7.79
1 to 2 Mbps	6211	11.95
2 to 3 Mbps	4685	9.02
3 to 4 Mbps	3991	7.68
>4Mbps	12892	24.81
Total	51965	100

VIL
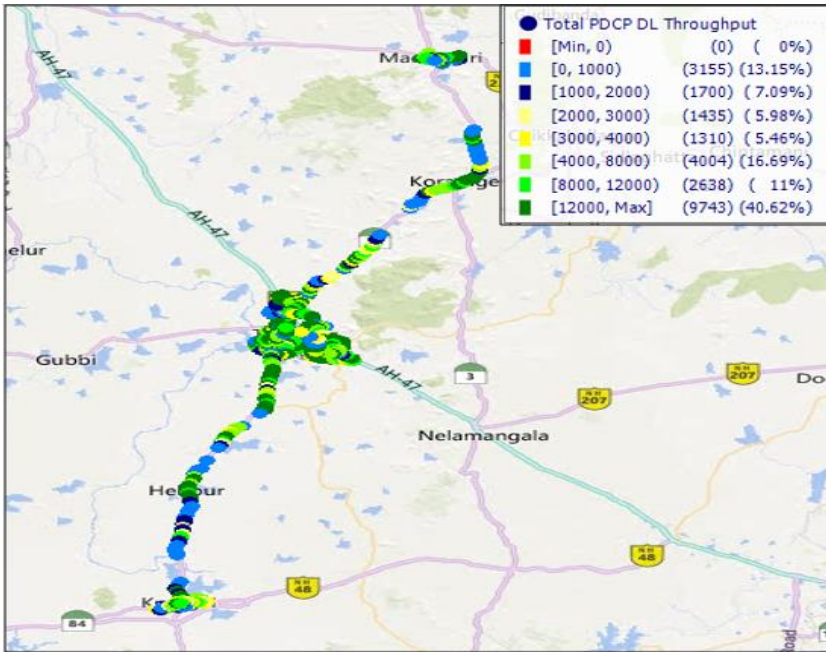
DL throughput	No. of Samples	%
0 to 1 Mbps	3155	13.15
1 to 2 Mbps	1700	7.09
2 to 3 Mbps	1435	5.98
3 to 4 Mbps	1310	5.46
4 to 8 Mbps	4004	16.69
8 to 12 Mbps	2638	11
>12 Mbps	9743	40.62
Total	23985	100
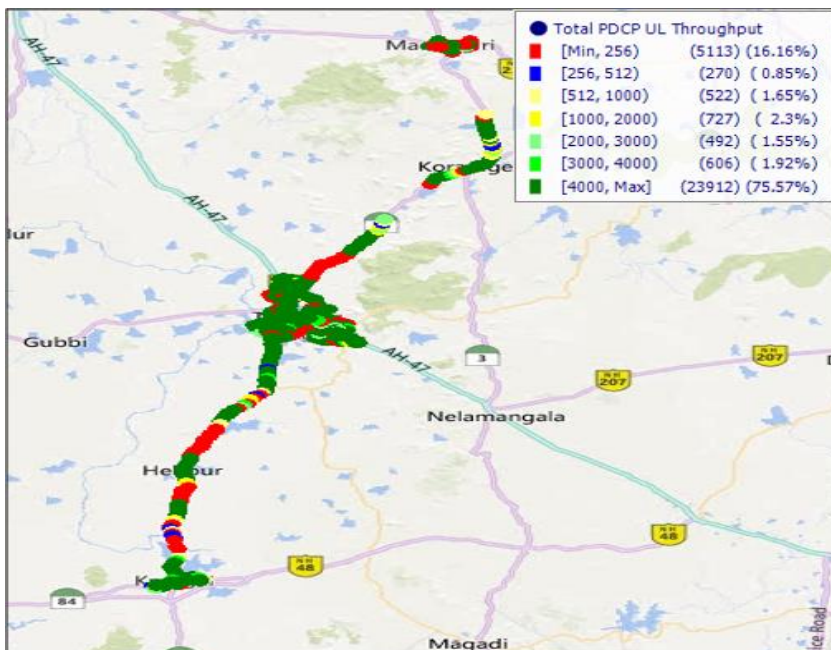
Upload throughput	No. of samples	%
0 to 256 kbps Mbps	5113	16.6
250 to 512 kbps	270	0.85
512 Kbps to 1 Mbps	522	1.65
1 to 2 Mbps	727	2.3
2 to 3 Mbps	492	1.55
3 to 4 Mbps	606	1.92
>4Mbps	23912	75.7
Total	31642	100

Technology-2G	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7
Download Speed	0.09	0.16	0.13	0.19	0.11	0.07	0.03
Upload Speed	0.02	0.04	0.08	0.05	0.06	0.02	0.01
Latency	Not captured in the App						

Technology-VoLTE	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7
Download Speed	22.08	47.25	36.93	19.61	108.31	30.46	9.00
Upload Speed	5.48	6.31	28.6	3.19	6.83	7.06	12.72
Latency	40.6	24.5	23.2	NC	37.4	47.9	NC

NC-Not captured in the App

Technology-2G	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7
Download Speed (Mbps)	0.04	0.02	0.22	0.15	0.21	0.18	0.12
Upload Speed (Mbps)	0.01	0.01	0.08	0.08	0.14	0.18	0.10
Latency	Not Captured in the App						
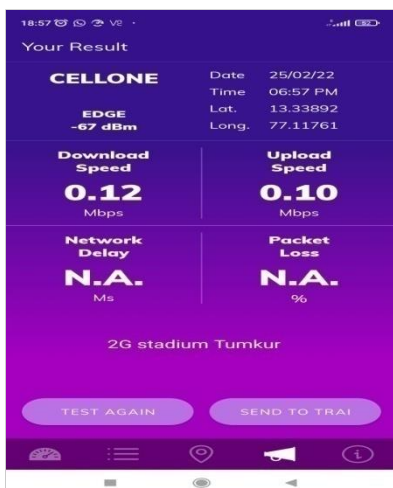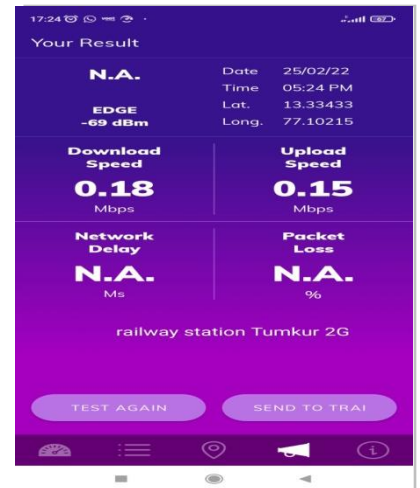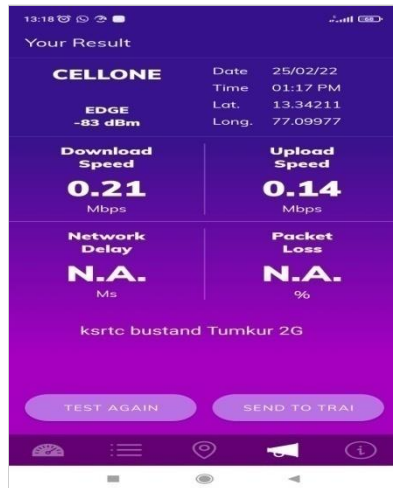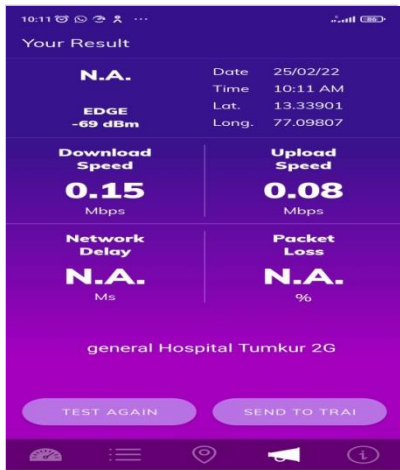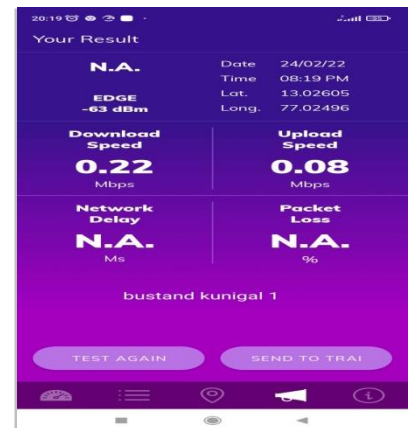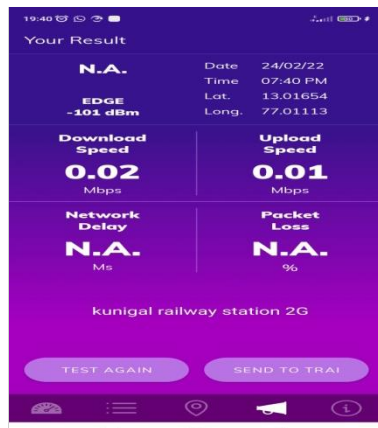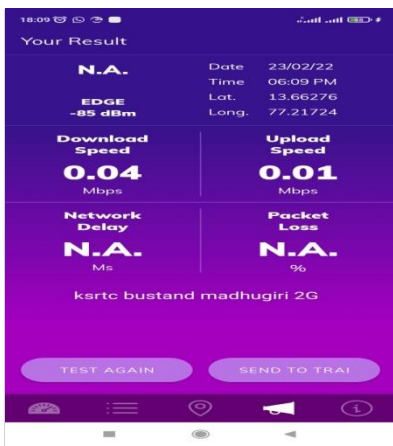
V. TRAI MySpeed App Test Details-3G

Technology-3G	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7
Download Speed (Mbps)	5.79	3.59	1.54	3.58	4.58	4.34	3.43
Upload Speed (Mbps)	1.32	1.41	1.46	1.64	0.71	0.79	1.48
Latency	Not captured in the App						

Technology-VoLTE	Madhugiri Bus stand	Railway station Kunigal	Kunigal Bus stand	General hospital TMKR	KSRTC Bus stand TMKR	Raliway station TMKR	MG Stadium TMKR
Download Speed(Mbps)	12.73	12.58	21.81	10.56	6.34	12.56	15.89
Upload Speed (Mbps)	6.17	6.09	22.65	7.25	7.77	6.09	2.86
Latency (ms)	39.3	44.2	47.1	53.1	44.3	44.2	33.5

Madhugiri Bus stand   **Railway station Kunigal**   **Kunigal Bus stand**   **General Hospital TMKR**

Ksrtc Bus Stand Tumkur   **Railway station Tumkur**   **MG Stadium**

Technology-2G	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7
Download Speed(Mbps)	0.26	0.15	0.31	0.20	0.18	0.33	0.32
Upload Speed(Mbps)	0.10	0.04	0.34	0.18	0.12	0.32	0.24
Latency	Not captured in the App						

Techology-4G/VoLTE	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7
Download Speed(Mbps)	30.48	15.77	49.89	19.90	19.58	17.96	11.75
Upload Speed(Mbps)	21.03	16.13	26.01	16.57	17.00	33.94	8.31
Latency	Not captured in the App						