

Operator Assisted Drive Test Report

For

Hassan

18th to 20th FEB 2025

Hassan – B.G Nagara – K.B Cross – Hassan : 200 Kms

(18-02-2025 NH)

Hassan – Arsikere - Banavara – Belur – Ballupet – Arakalagud -
Hassan: 195 Kms

Hassan City and Surrounding Area – 110 Kms.
(19-02-2025 & 20-02-2025)

TRAI RO, Bengaluru

Key Performance Indicators:

- All TSPs have met the 2% QOS benchmark of Drop Call Rate except BSNL 2G & 3G.
- All TSPs have met the 3% QOS benchmark of Call Block Rate.
- All 2G/3G/4G TSPs have met the Rx Quality except BSNL 2G 3G ,Airtel 4G ,JIO 4G and VIL 4G.
- All TSPs have met the Mobility HOSR except BSNL 2G.

The Operator Assisted Drive Test has been carried out by the Regional Office, Bangalore with the help of Service Providers from 18th to 20th FEB 2025. The drive test covered the route of 500 Kms including NH/SH of 200 Kms & 6 hotspots. Approximately 480 calls were made for each of the 7 networks: three 2G networks, one 3G network, and three 4G networks covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

Regional Office, TRAI Bengaluru conducted Operator Assisted Drive Test from **18th to 20th FEB 2025** covering various locations in **Hassan & Surrounding Region**. The performance of Airtel, BSNL, Vodafone Idea, and Jio were monitored across various technologies (2G, 3G, and 4G/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, Hand Over 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 a wait time of 10 sec between calls in all technologies. The drive test covered a drive route of approximately **500 KMs** including **NH/SH of 200 Kms** over a period of 3 days from **18th to 20th FEB 2025**. Approximately 480 calls were made for each of the 7 networks: three 2G (Lock Mode) networks, one 3G (Dual mode) network, and three 4G networks covering 4 unique TSPs.

Data Tests: Dynamic data test (Test Data on Move) was conducted for **500 KMs** including **NH/SH of 200 Kms** over a period of 3 days for download throughput for 3G & 4G technology. Data Tests were performed at 6 static locations; three 2G (Lock mode) networks, one 3G (Dual mode) network, and three 4G (Free mode) networks covering 4 unique TSPs were tested. **All the data through put figure mentioned in the report are based on the average value.**

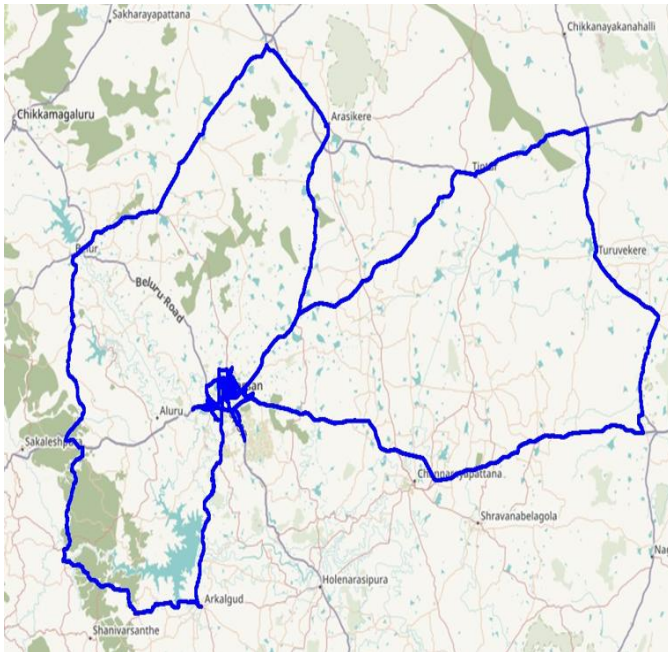
* For Voice and Data KPI's, 2G measurement is done with UE locked on 2G, 3G measurement is done with UE in Dual mode (2G & 3G) and 4G measurement is done with UE in Free Mode.

* 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.

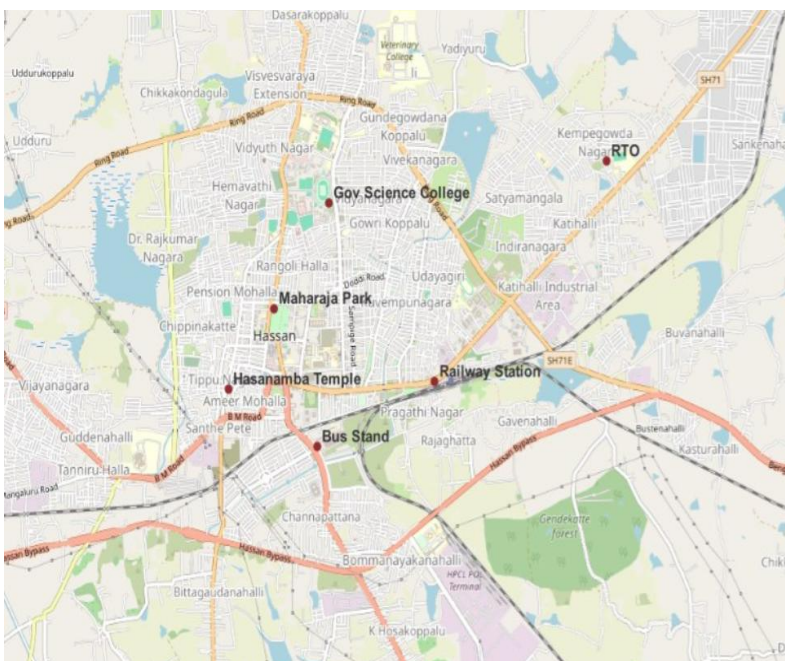
Service	Specifications
Download	2G (Locked) - 500KB, 3G (Dual) - 20 MB, 4G (Free) - 40 MB
Upload	2G (Locked) - 100KB, 3G (Dual) - 5 MB, 4G (Free) - 10 MB
Web Browsing	3 links of e/m commerce website www.amazon.in , www.flipkart.com and PayTm
Latency	32 Bytes on www.google.com
Video Streaming	130 secs clip

Voice & Dynamic Data Test (Data Test on Move) Drive Route



Areas covered	
Hassan	Mattanavile
Dudda	Channarayapattana
Gandasi	Arakalgud
Tiptur	Kodlipet
KB Cross	Ballupet
Turuvekere	Belur
Nagalapura	Halebeedu
Adichunchanagiri	Javagal
BG Nagara	Banavara
Hirisave	Arasikere

Data Service Test- Static Locations



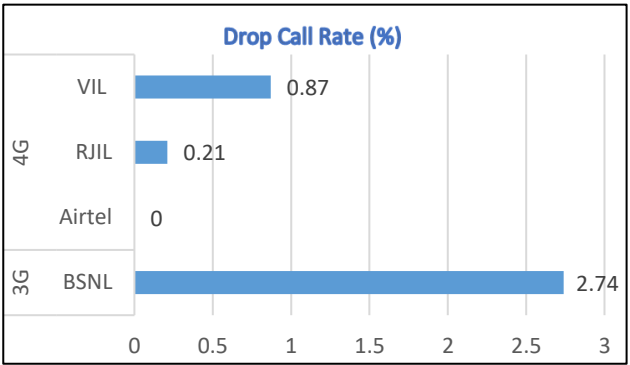
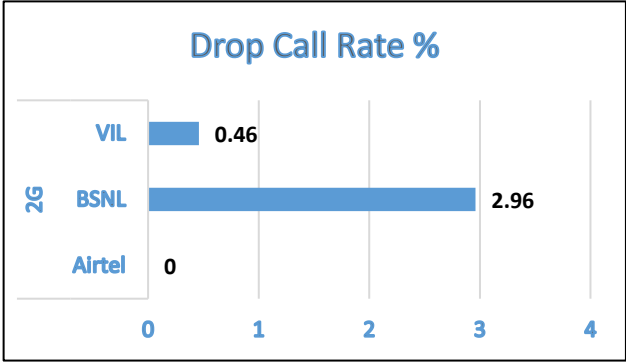
Location Name
Hasanamba Temple
Maharaja Park
Govt. Science College
KSRTC Bus Stand
Hassan Railway Junction
RTO Office

Voice Calls

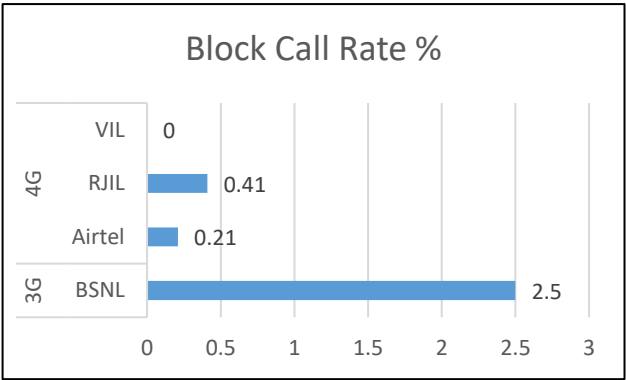
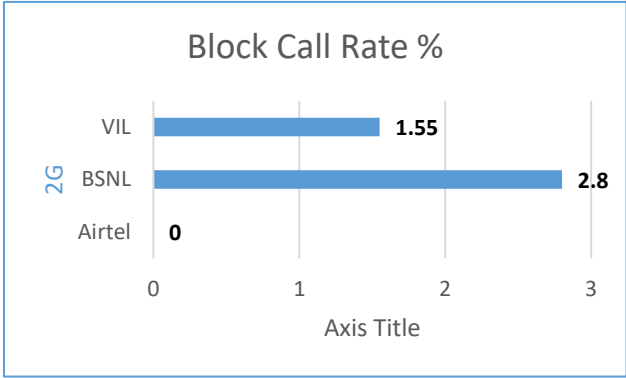
Key Observations

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

Drop Call Rate (%)



Block Call Rate (%)



KPIs	2G			3G	4G		
	Airtel	BSNL	VIL	BSNL	Airtel	RJIL	VIL
Drop Call Rate %	0	2.96	0.46	2.74	0	0.21	0.87
Block Call Rate %	0	2.8	1.55	2.5	0.21	0.41	0

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate except BSNL 2G & 3G
- b) All TSPs have met the 3% QOS benchmark of Call Block.

Voice Calls

Key Observations

Coverage

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

TSPs	2G		
	Airtel	BSNL	VIL
Coverage%	78.92	61.6	69.84

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

TSPs	3G	4G		
	BSNL	Airtel	JIO	VIL
Coverage %	66.5	96.69	96.8	84.76

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

TSPs	3G	4G		
	BSNL	Airtel	JIO	VIL
Time Spent on 3G/4G%	26	100	100	99.23

Summary

City Level Summary

Voice Call	2G		
	Airtel	BSNL	VIL
Call Attempt	448	569	451
Blocked Call Rate (%)	0	2.8	1.55
CSSR% (Accessibility)	100	97.18	98.45
Drop Call Rate (%)	0	2.96	0.46
Rx Quality (%)	95.25	91.6	95.29
Mobility HOSR (%)	99.01	94.16	97.89

Voice Call	3G/4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Call Attempt	550	465	483	458
Blocked Call Rate (%)	2.5	0.21	0.41	0
CSSR% (Accessibility)	97.45	99.64	99.59	100
Drop Call Rate (%)	2.74	0	0.21	0.87
Rx Quality (%)	84.2	90.62	92.53	94.43
Mobility HOSR (%)	98.91	99.56	98.81	99.78

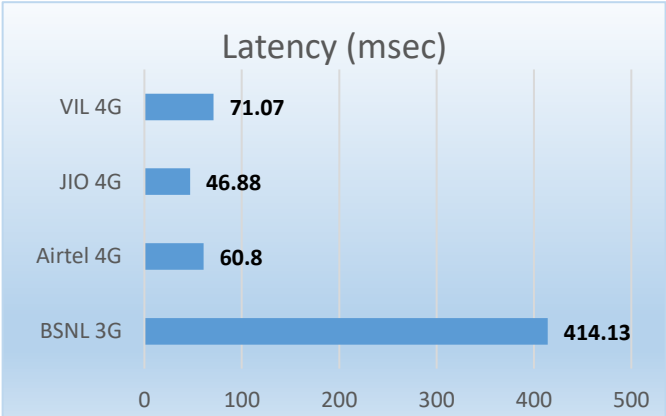
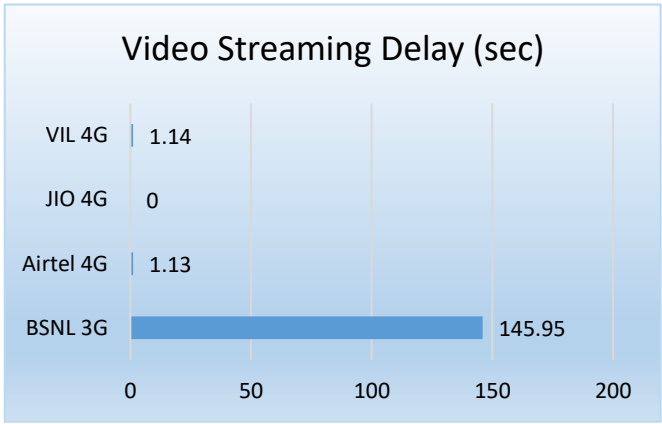
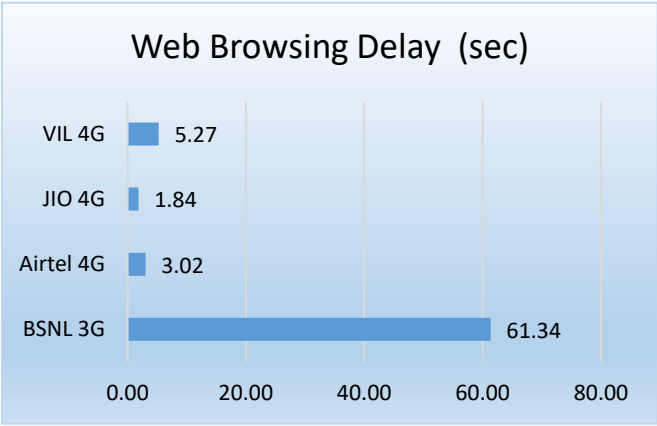
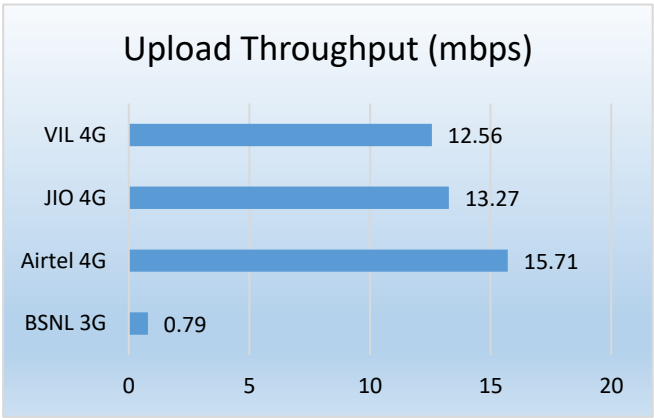
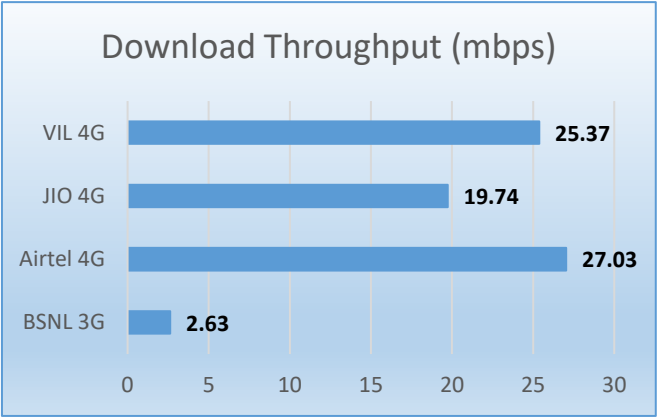
Data Services Static

Key Observations

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

Data Download, Upload Performance (Mbps), Web Browsing delay, Video Streaming and Latency 3G/4G

3G/4G/ Network:



Summary

City Level Summary(contd.)

Data Services Static	3G/4G			
	BSNL 3G	Airtel 4G	JIO 4G	VIL 4G
Download Throughput (mbps)	2.63	27.03	19.74	25.37
Upload Throughput (mbps)	0.79	15.71	13.27	12.56
Web Browsing Delay (sec)	61.34	3.02	1.84	5.27
Video Streaming Delay (sec)	145.95	1.13	0	1.14
Latency (msec)	414.13	60.8	46.88	71.07

Data Services Dynamic (Data Test on Move)	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (mbps)	1.42	49.22	12.57	22.64
Upload Throughput (mbps)	0.69	10.78	*	7.14

* UL Throughput data & plots Dynamic drive of JIO not available due to Log File Issue as declared by JIO

Summary

City Level Data Services Static(contd.)

Data Services Static - Hassanamba Temple	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	1.973	28.31	12.29	24.55
Upload Throughput (Mbps)	0.59	16.46	16.3	15.64
Web Browsing Delay (sec)	79.11	2.14	1.73	4.77
Video Streaming Delay (sec)	144.08	1.52	0	0.82
Latency (ms)	297	56.4	70.54	75.4

Maharaja Park	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	2.81	25.38	7.9	44.57
Upload Throughput (Mbps)	0.58	6.53	9.41	15.282
Web Browsing Delay (sec)	51.5	1.56	1.78	3.978
Video Streaming Delay (sec)	147.68	1.57	0	0.82
Latency (ms)	183.2	58	39	71

Data Services Static - KSRTC Bus Terminal	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	2.58	43	14.39	9.54
Upload Throughput (Mbps)	0.66	22.54	16.09	6.72
Web Browsing Delay (sec)	89.31	4.84	1.76	6.76
Video Streaming Delay (sec)	145.99	0.65	0	2.15
Latency (ms)	204.6	68.6	52.36	68.4

Summary

City Level Data Services Static(contd.)

Data Services Static - GOVT Science College	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	2.16	12.95	45.12	35.92
Upload Throughput (Mbps)	0.59	13.07	15.53	15.5
Web Browsing Delay (sec)	123.13	5.28	0.97	5.45
Video Streaming Delay (sec)	145.7	1.1	0	1.34
Latency (ms)	778	73	35.84	73

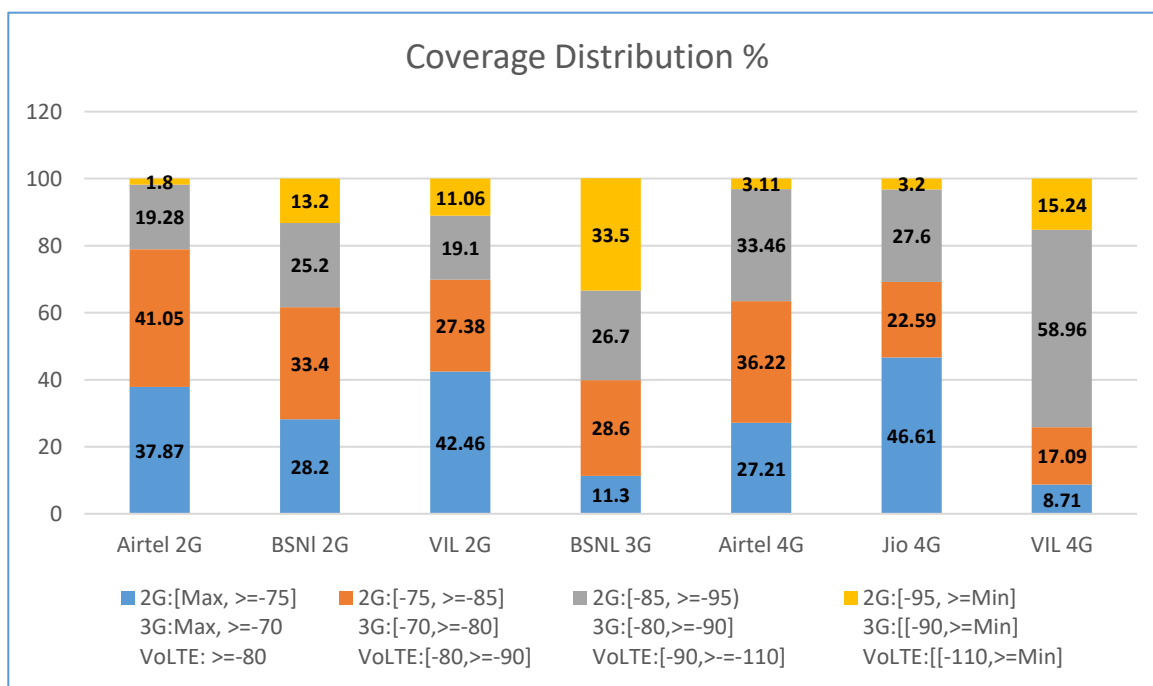
Data Services Static - RTO Hassan	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	3.45	18.14	16.38	19.28
Upload Throughput (Mbps)	1.03	15.39	12.75	12.68
Web Browsing Delay (sec)	11.41	2.15	0.81	5.67
Video Streaming Delay (sec)	146.96	0.96	0	0.88
Latency (ms)	286.4	64.2	32.8	69.6

Data Services Static - Railway Station Hassan	3G	4G		
	BSNL	Airtel	JIO	VIL
Download Throughput (Mbps)	2.79	34.42	22.37	18.32
Upload Throughput (Mbps)	1.28	20.3	9.52	9.53
Web Browsing Delay (sec)	13.6	2.16	4	5.01
Video Streaming Delay (sec)	145.28	0.98	0	0.84
Latency (ms)	735.6	44.8	50.47	69

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	78.92
BSNI 2G	61.60
VIL 2G	69.84
BSNL 3G	66.50
Airtel 4G	96.69
Jio 4G	96.80
VIL 4G	84.76

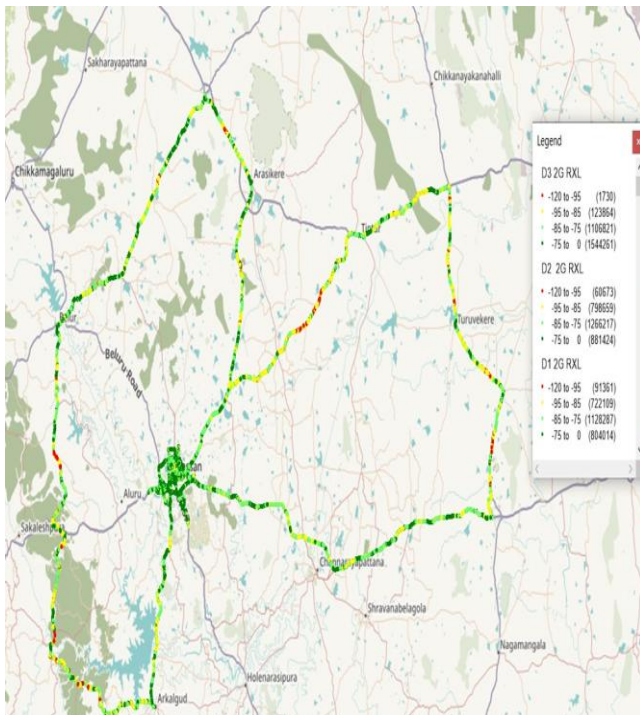


I. Coverage Details

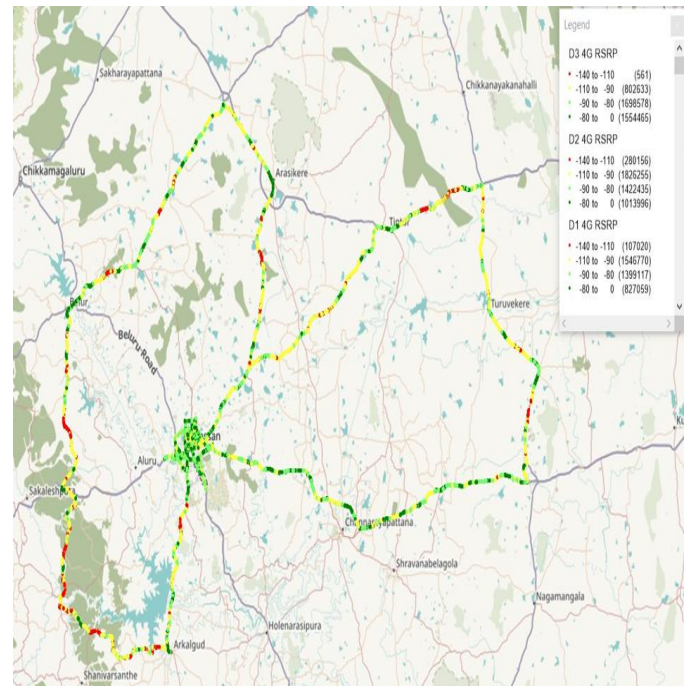
AIRTEL

Technology	Coverage Rate %
2G	78.92
4G	96.69

2G



4G



2G		
Overall RxLevel	# Samples	% PDF
[Max, >=-75]	3229699	37.87
[-75, >=-85)	3501325	41.05
[-85, >=-95)	1644632	19.28
[-95, >=Min)	153764	1.8
Total	8529420	100

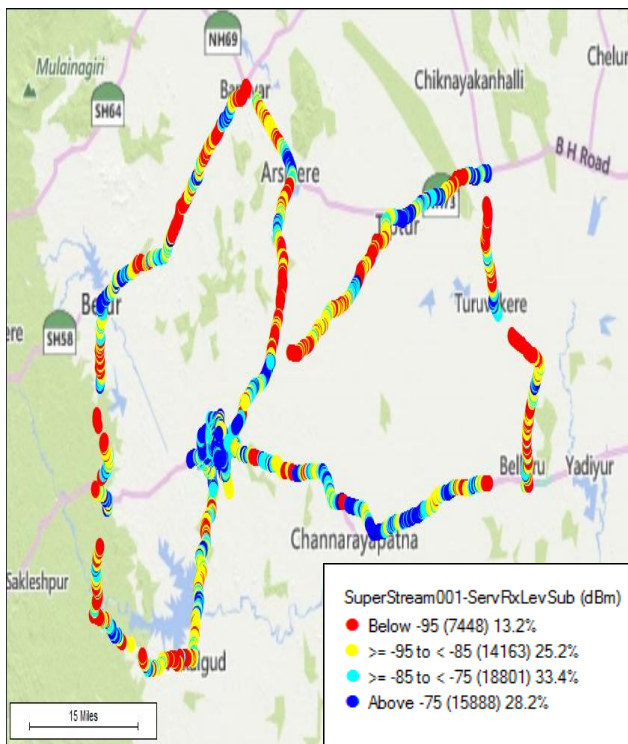
4G/VoLTE		
Overall RSRP	# Samples	% PDF
[Max, >=-80]	3395520	27.21
[-80, >=-90)	4520130	36.22
[-90, >=-110)	4175658	33.46
[-110, >=Min)	387737	3.11
Total	12479045	100

I. Coverage Details

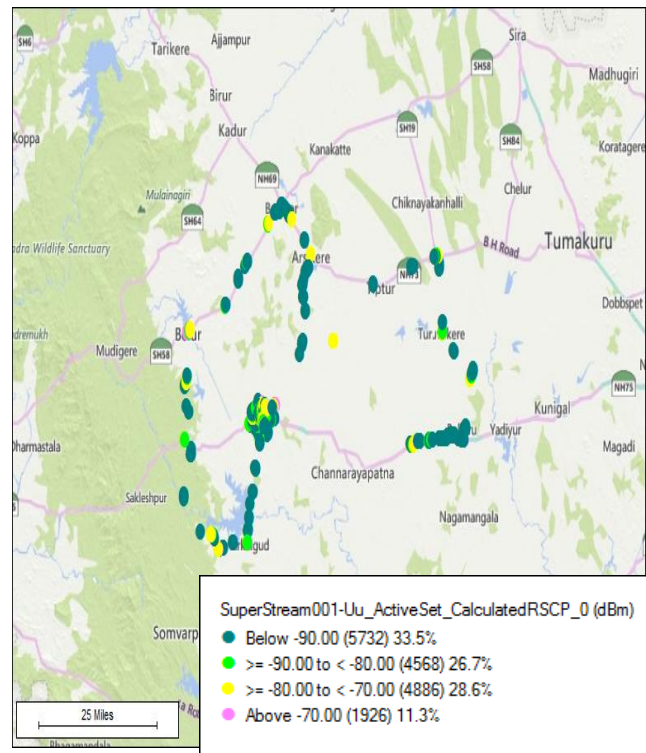
BSNL

Technology	Coverage Rate %
2G	61.60
3G	66.50

2G



3G

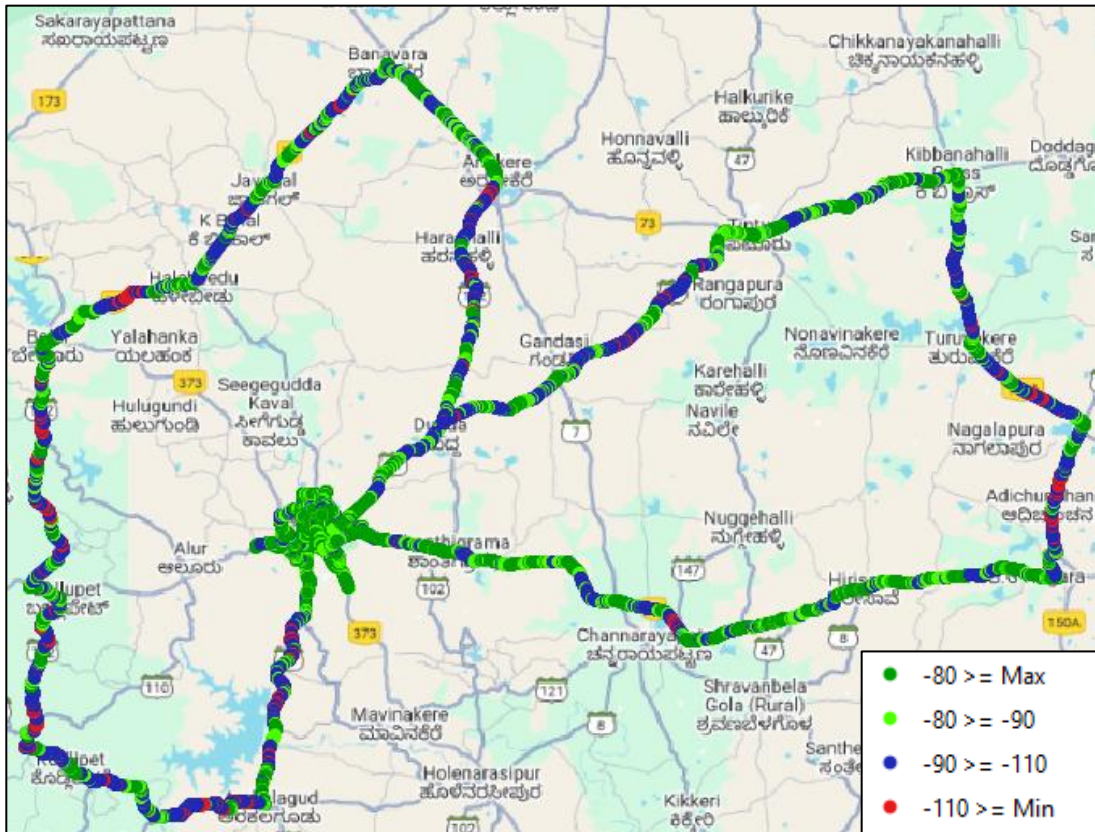


2G			3G		
Overall RxLevel	# Samples	% PDF	Overall RSCP	# Samples	% PDF
[Max, ≥ -75]	15888	28.2	[Max, ≥ -70]	1926	11.3
$[-75, \geq -85)$	18801	33.4	$[-70, \geq -80)$	4886	28.6
$[-85, \geq -95)$	14163	25.2	$[-80, \geq -90)$	4568	26.7
$[-95, \geq \text{Min})$	7448	13.2	$[-90, \geq \text{Min})$	5732	33.5
Total	56300	100	Total	17112	100

I. Coverage Details

JIO

Technology	Coverage Rate %
4G	96.80



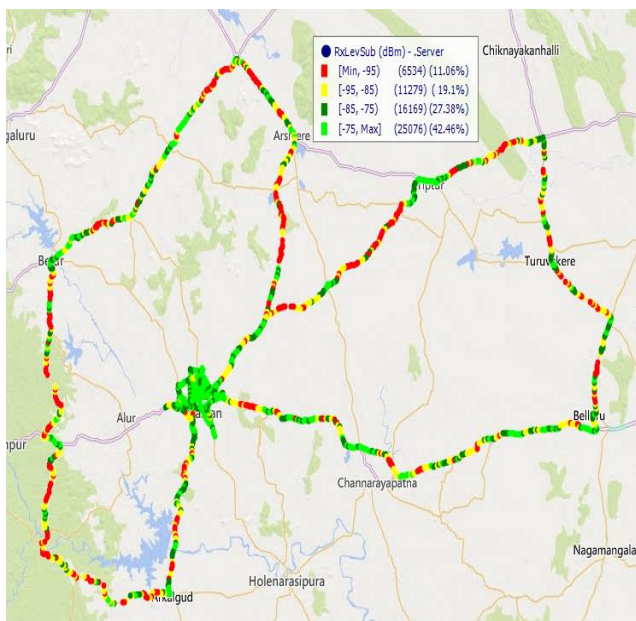
4G/VoLTE		
Overall RSRP	# Samples	% PDF
[Max, >=-80]	28727	46.61
[-80, >=-90)	13927	22.59
[-90, >=-110)	17011	27.6
[-110, >=Min)	1974	3.2
Total	61639	100

I. Coverage Details

VIL

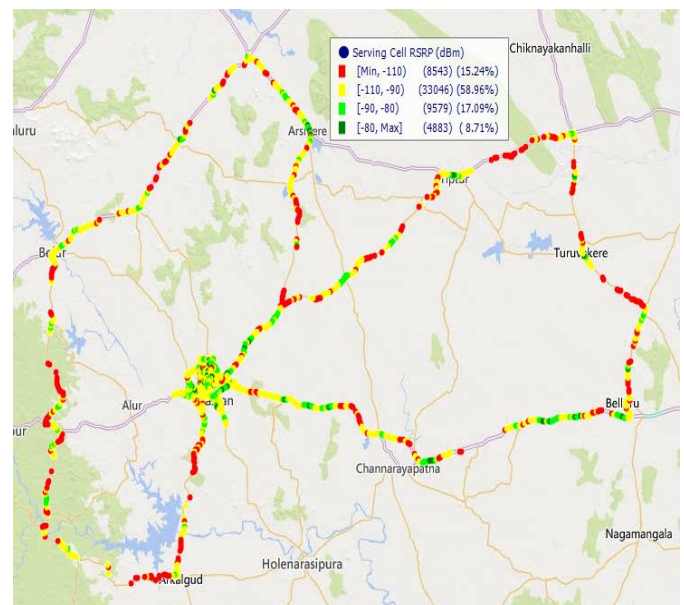
Technology	Coverage Rate %
2G	69.84
4G	84.76

2G



2G		
Overall RxLevel	# Samples	% PDF
[Max, >=-75]	25076	42.46
[-75, >=-85)	16169	27.38
[-85, >=-95)	11279	19.10
[-95, >=Min)	6534	11.06
Total	59058	100

4G

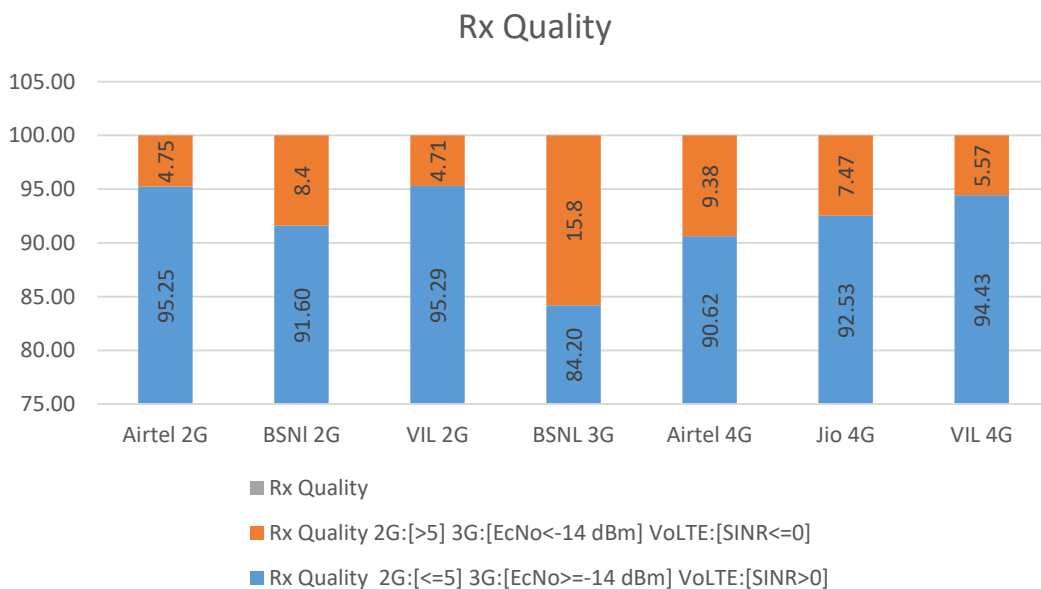


4G		
Overall RSRP	# Samples	% PDF
[Max, >=-80]	4883	8.71
[-80, >=-90)	9579	17.09
[-90, >=-110)	33046	58.96
[-110, >=Min)	8543	15.24
Total	56051	100

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 4G is considered to be good, where as quality beyond this benchmark is considered to be bad. The benchmark should usually be $\geq 95\%$.

Rx Quality	Rx Quality 2G:[≤ 5] 3G:[EcNo ≥ -14 dBm] VoLTE:[SINR > 0]
Airtel 2G	95.25
BSNI 2G	91.6
VIL 2G	95.29
BSNL 3G	84.2
Airtel 4G	90.62
Jio 4G	92.53
VIL 4G	94.43

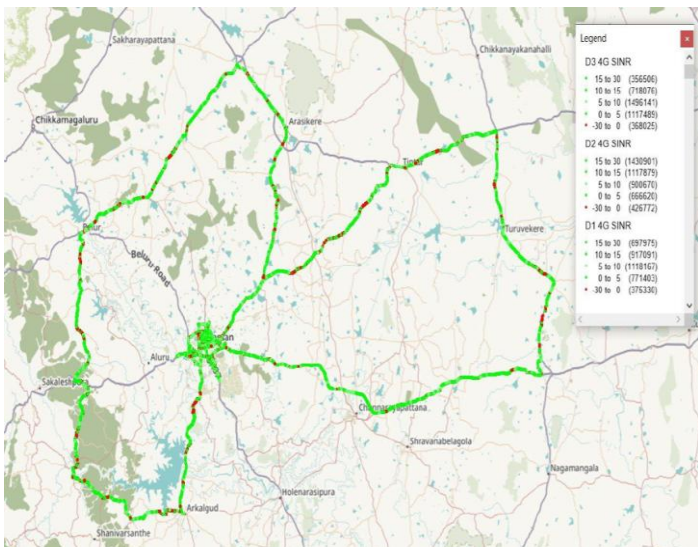


II. Quality Details

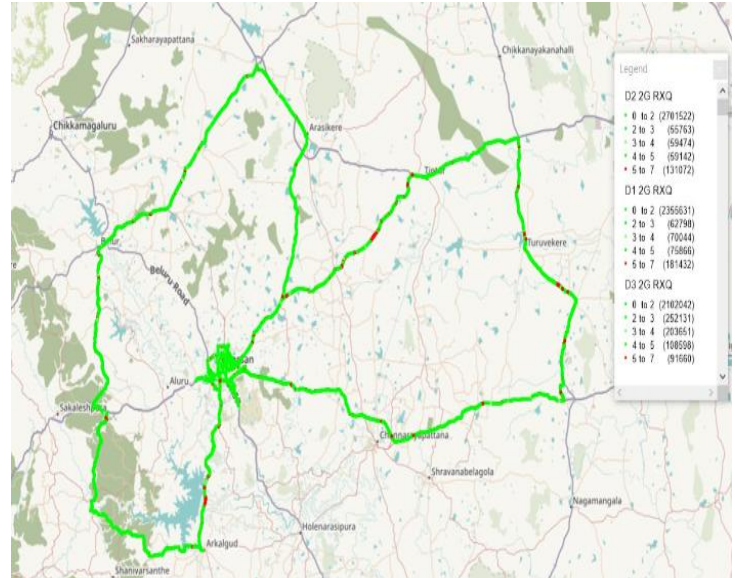
Airtel

Technology	Rx Quality %
2G	95.25
4G	90.62

2G



4G



Overall Rx Quality	# Samples	% PDF
(Min, <=2)	7159195	84.12%
(2, <=3)	370692	4.36%
(3, <=4)	333169	3.91%
(4, <=5)	243606	2.86%
(5, <=Max)	404164	4.75%
Total	8510826	100

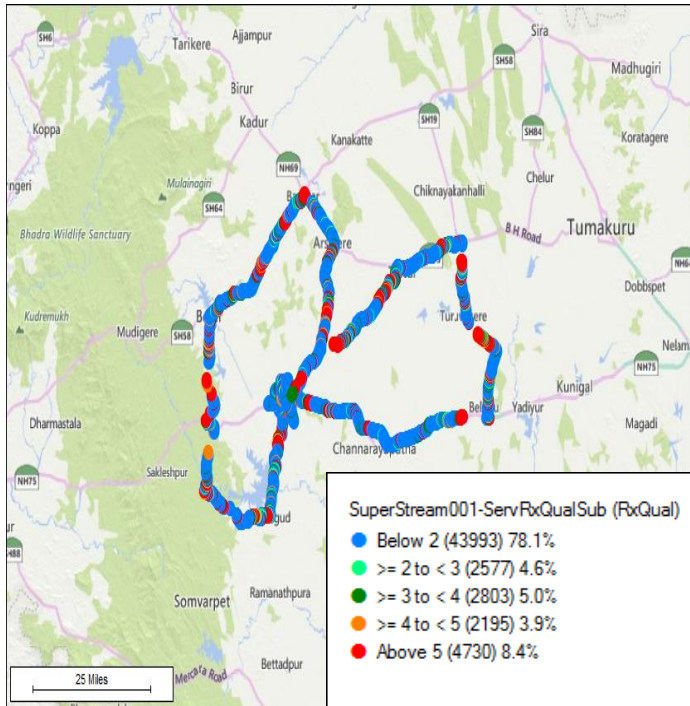
Overall SINR	# Samples	% PDF
(Min, <=0)	1171127	9.38
(0, <=5)	2555512	20.48
(5, <=10)	3514978	28.16
(10, <=15)	2753046	22.06
(15, <=Max)	2485382	19.91
Total	12480045	100

II. Quality Details

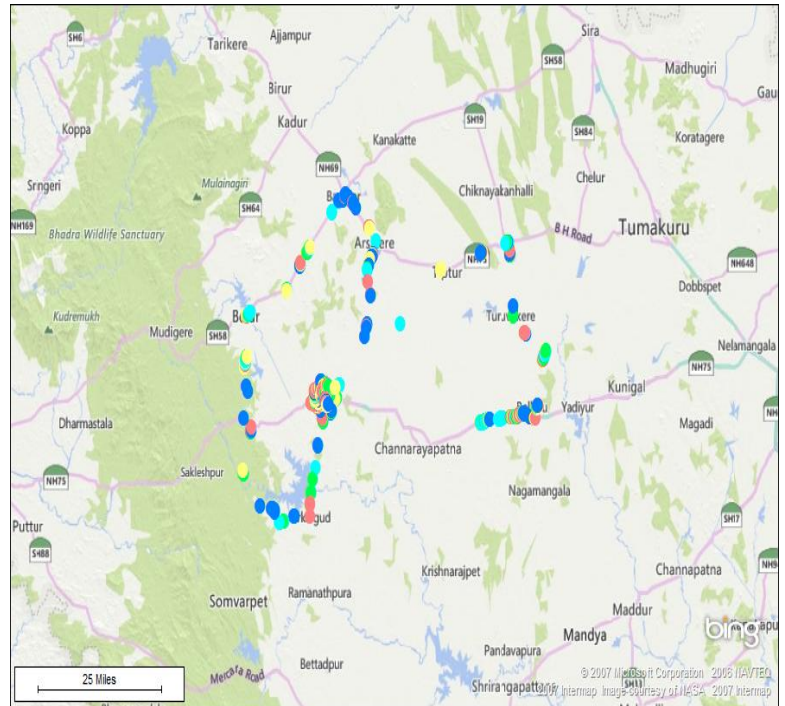
BSNL

Technology	Rx Quality %
2G	91.60
3G	84.20

2G



3G



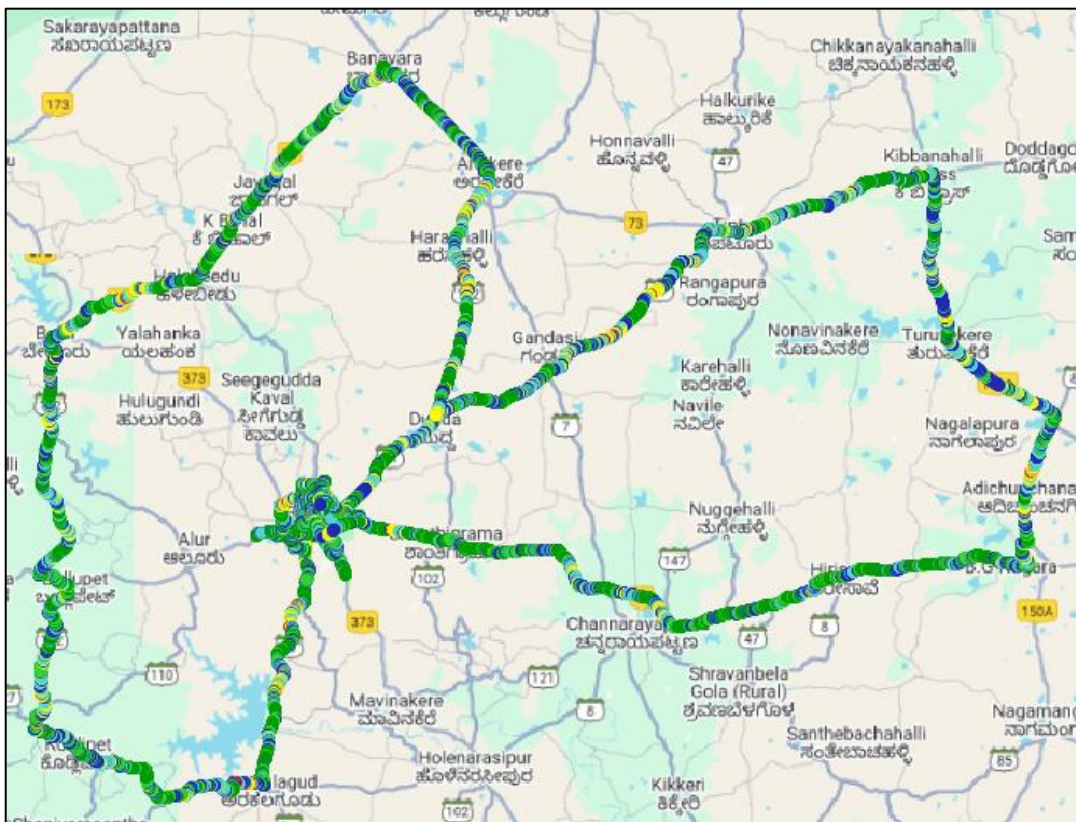
Overall Rx Quality	# Samples	% PDF
(Min, ≤ 2)	43993	78.1
(2, ≤ 3)	2577	4.6
(3, ≤ 4)	2803	5
(4, ≤ 5)	2195	3.9
(5, \leq Max)	4730	8.4
Total	56298	100

Overall EcNo	# Samples	% PDF
(Max, ≤ -6)	2287	13.4
(-6, ≤ -9)	3976	23.2
(-9, ≤ -11)	3239	18.9
(-11, ≤ -14)	4906	28.7
(-14, \leq Min)	2704	15.8
Total	17112	100

II. Quality Details

JIO

Technology	Rx Quality (%)
4G/4G	92.53



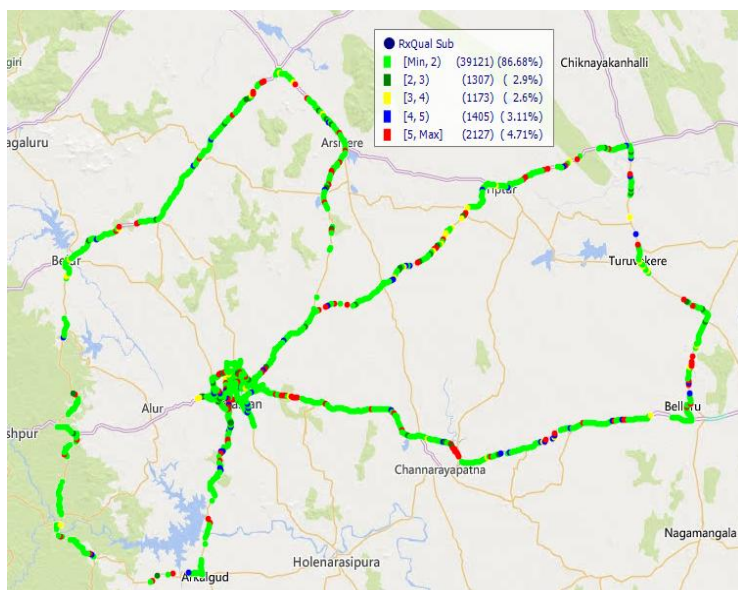
Overall SINR	# Samples	% PDF
(15, <=Max)	18953	30.75
(10, <=15)	13328	21.62
(5, <=10)	13968	22.66
(0, <=5)	10789	17.50
(-6, <=0)	4320	7.01
(Min, <=-6)	281	0.46
Total	61639	100

II. Quality Details

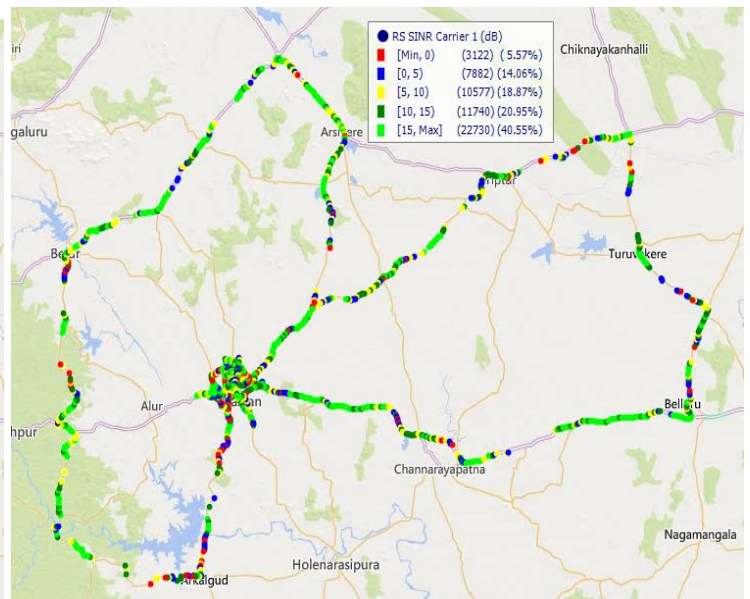
VIL

Technology	Rx Quality %
2G	95.29
4G	94.43

2G



4G

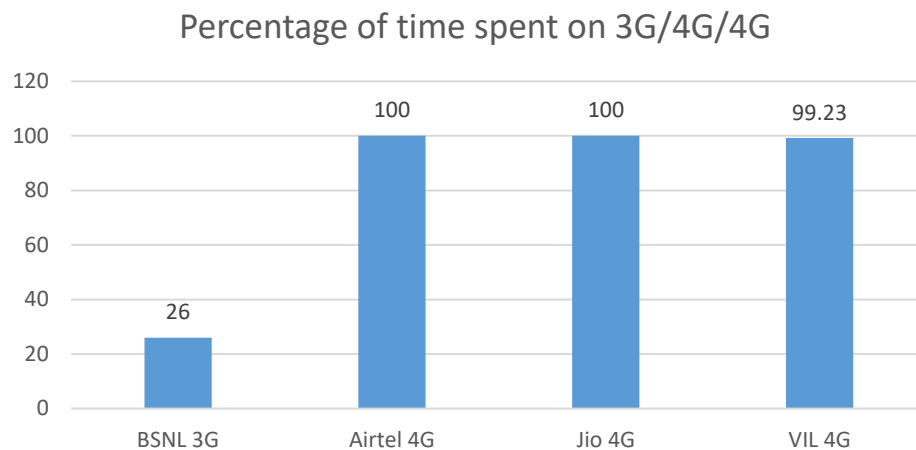


2G		
Overall Rx Quality	# Samples	% PDF
(Min, <=2)	39121	86.68
(2, <=3)	1307	2.90
(3, <=4)	1173	2.60
(4, <=5)	1405	3.11
(5, <=Max)	2127	4.71
Total	45133	100

4G		
Overall SINR	# Samples	% PDF
(Min, <=0)	3122	5.57
(0, <=5)	7882	14.06
(5, <=10)	10577	18.87
(10, <=15)	11740	20.95
(15, <=Max)	22730	40.55
Total	56051	100

III. Technology Details

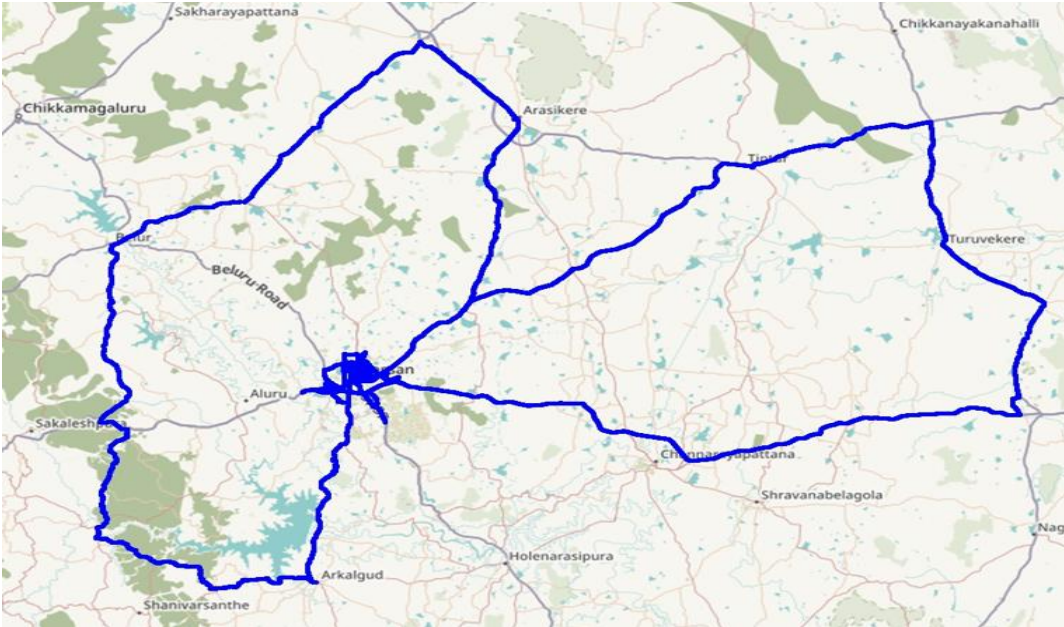
TSP	Percentage of time spent on 3G/4G/4G
BSNL 3G	26
Airtel 4G	100
Jio 4G	100
VIL 4G	99.23



III. Technology Details

Airtel

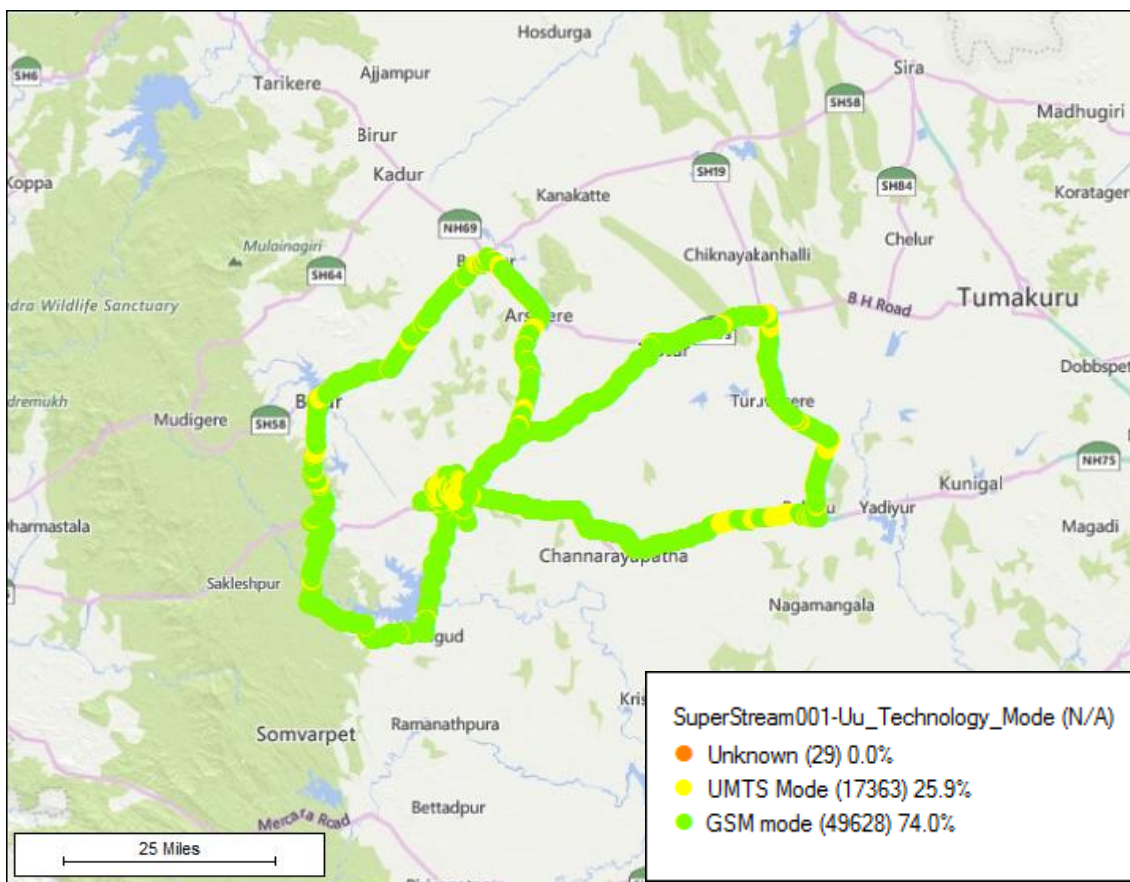
Technology	Time Spent %
4G	100



III. Technology Details

BSNL

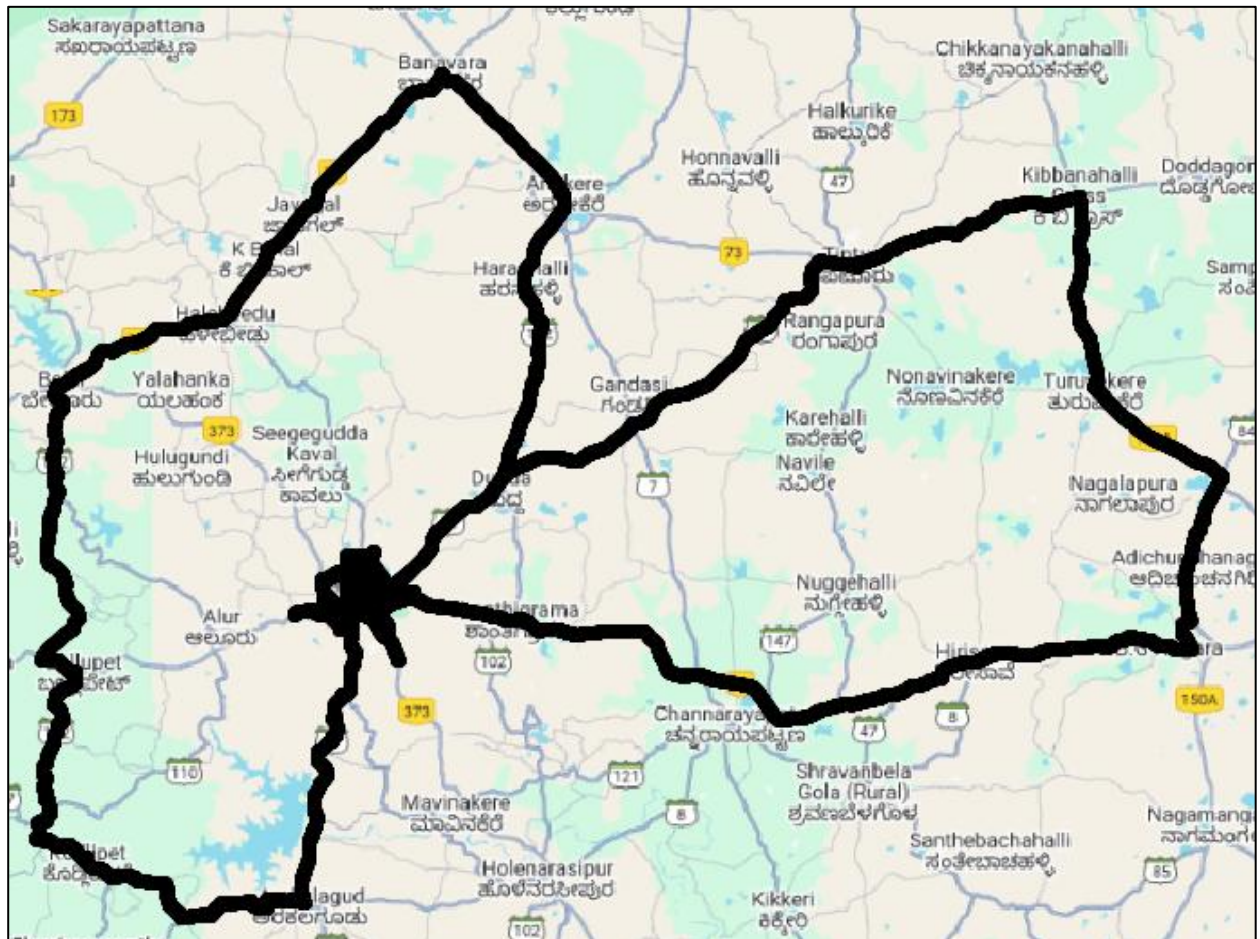
Technology	Time Spent %
3G	26



III. Technology Details

JIO

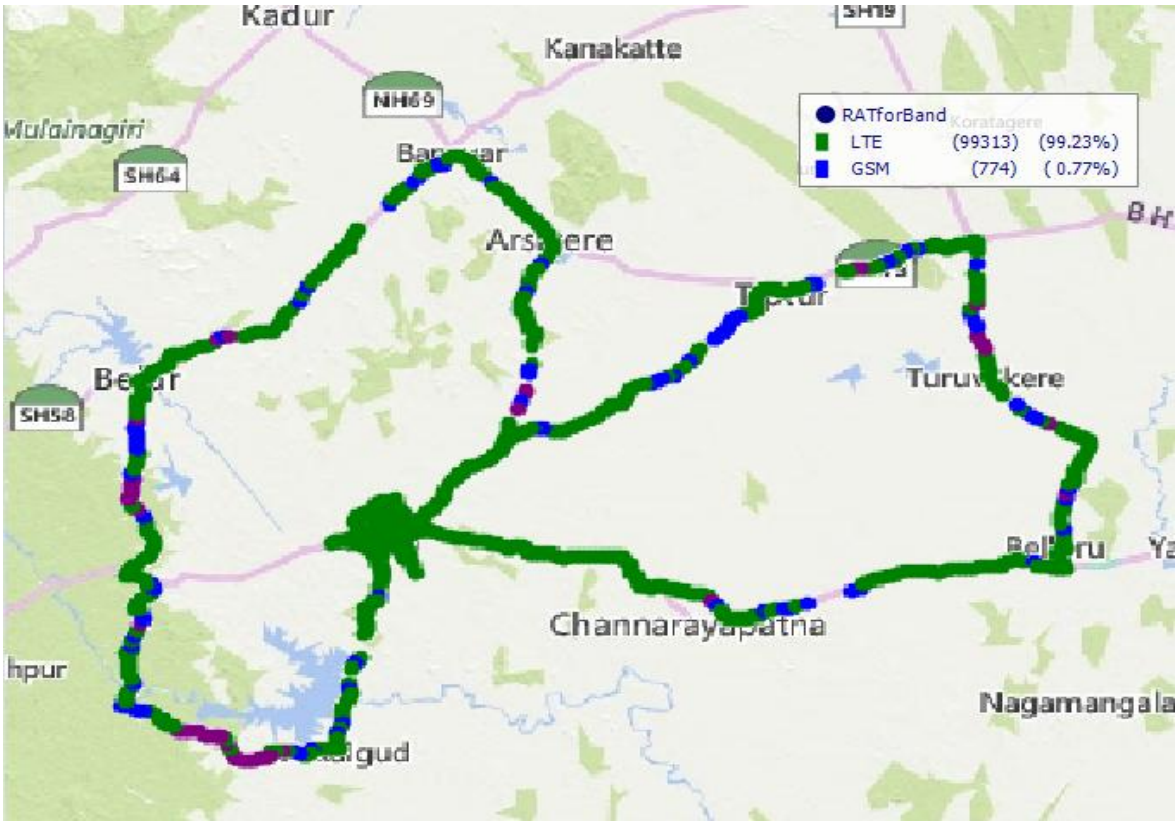
Technology	Time Spent %
4G	100



III. Technology Details

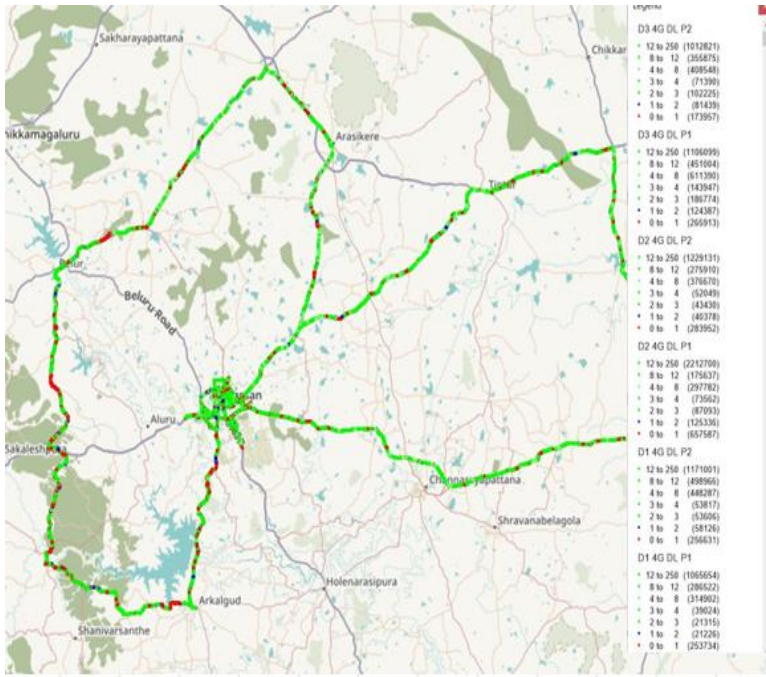
VIL

Technology	Time Spent
4G	99.23

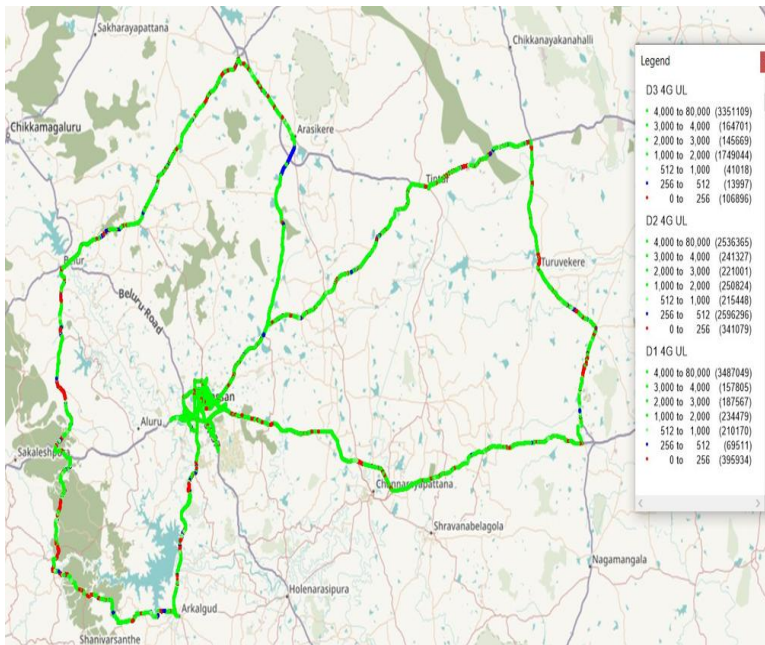


IV. Dynamic Data Test (Data Test on Move) - 4G DL/UL Details

Airtel



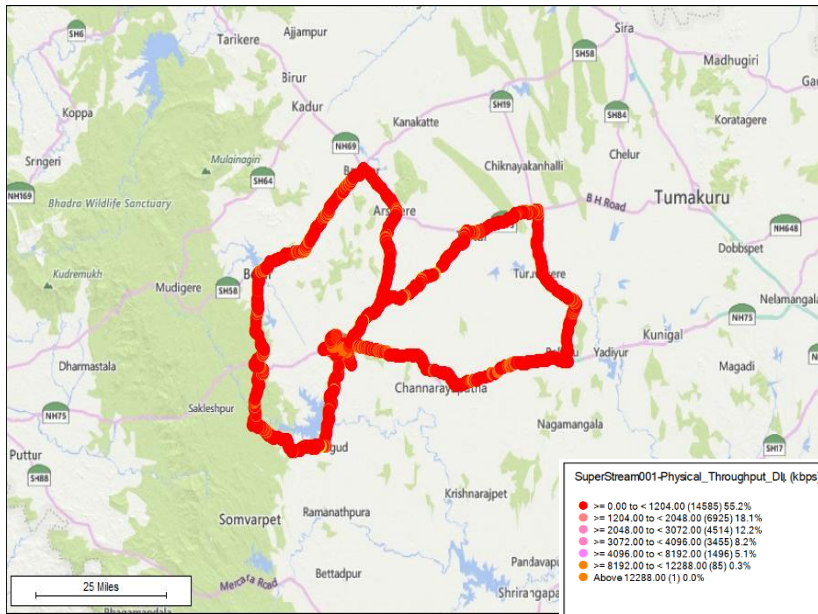
DL throughput	Total Samples	%
0 to 1 Mbps	1891774	12.15
1 to 2 Mbps	450892	2.90
2 to 3 Mbps	494443	3.18
3 to 4 Mbps	433789	2.79
4 to 8 Mbps	2457579	15.78
8 to 12 Mbps	2043914	13.13
>12 Mbps	7797406	50.08
Total	15569797	100.00



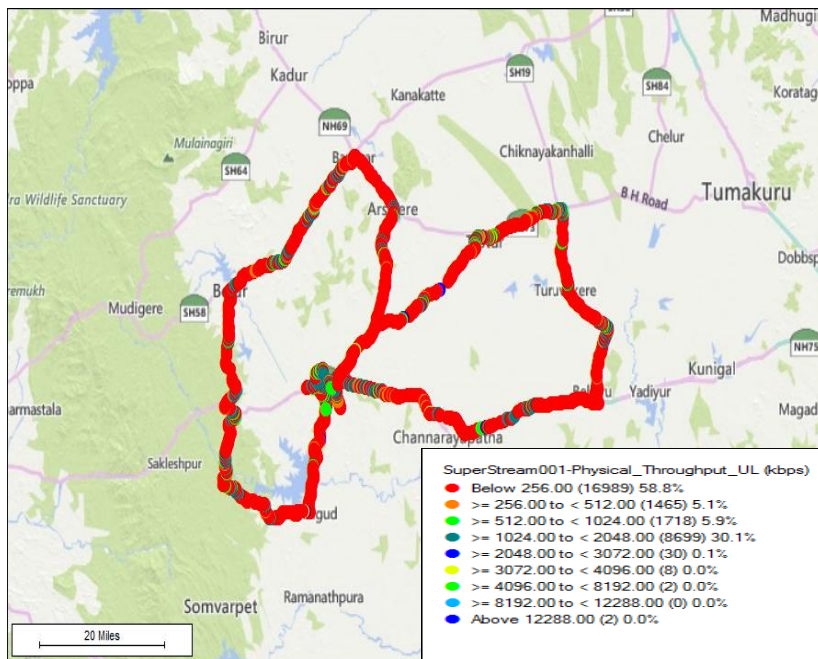
Upload throughput	Total	%
0 to 256 kbps	843909	5.05
250 to 512 kbps	2679804	16.03
512 Kbps to 1 Mbps	466636	2.79
1 to 2 Mbps	2234347	13.37
2 to 3 Mbps	554237	3.32
3 to 4 Mbps	563833	3.37
>4Mbps	9374523	56.08
Total	16717289	100.00

IV. Dynamic Data Test(Data Test on Move)- 3G/4G DL/UL Details

BSNL



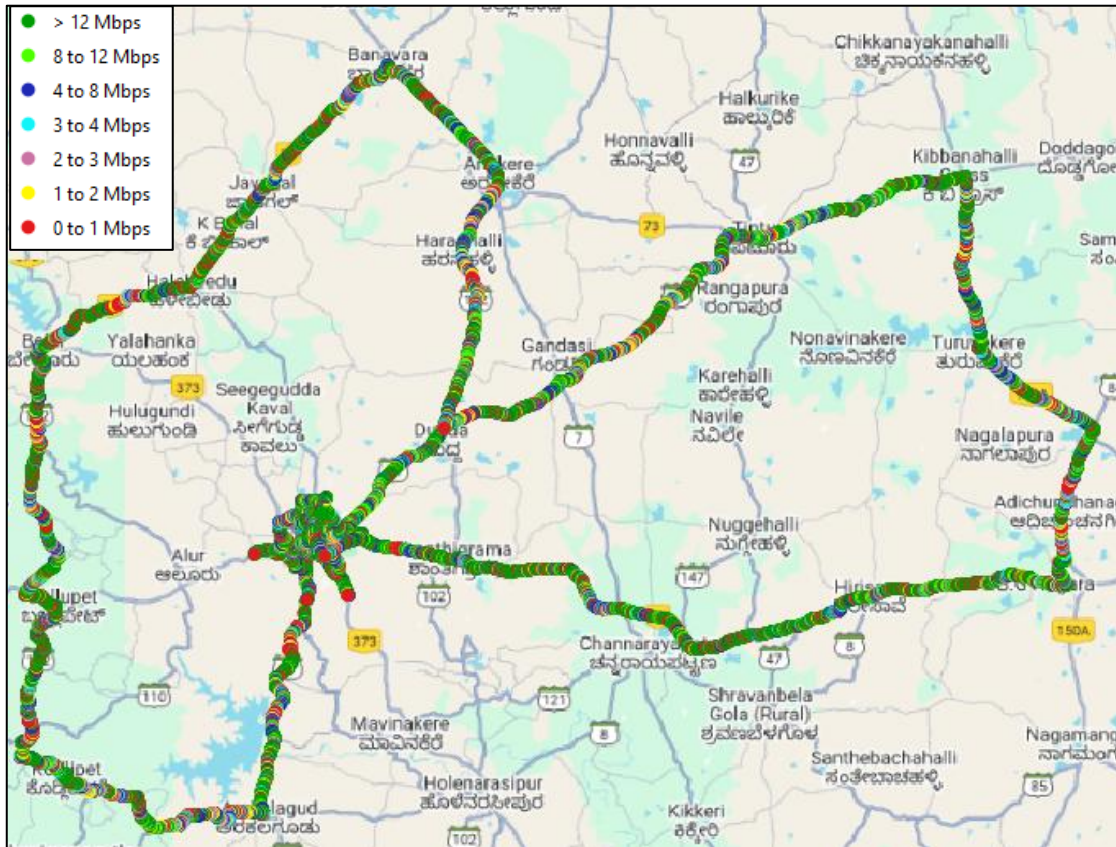
DL throughput	No. of Samples	%
0 to 1 Mbps	14585	55.2
1 to 2 Mbps	6925	18.1
2 to 3 Mbps	5625	12.2
3 to 4 Mbps	3455	8.2
4 to 8 Mbps	1496	5.1
8 to 12 Mbps	85	0.3
>12 Mbps	1	0
Total	32172	100



Upload throughput	No. of samples	%
0 to 256 kbps	16989	58.8
256 to 512 kbps	1465	5.1
512 Kbps to 1 Mbps	1718	5.9
1 to 2 Mbps	8699	30.1
2 to 3 Mbps	30	0.1
3 to 4 Mbps	2	0
>4Mbps	0	0
Total	28911	100

IV. Dynamic Data Test(Data Test on Move)- 4G DL/UL Details

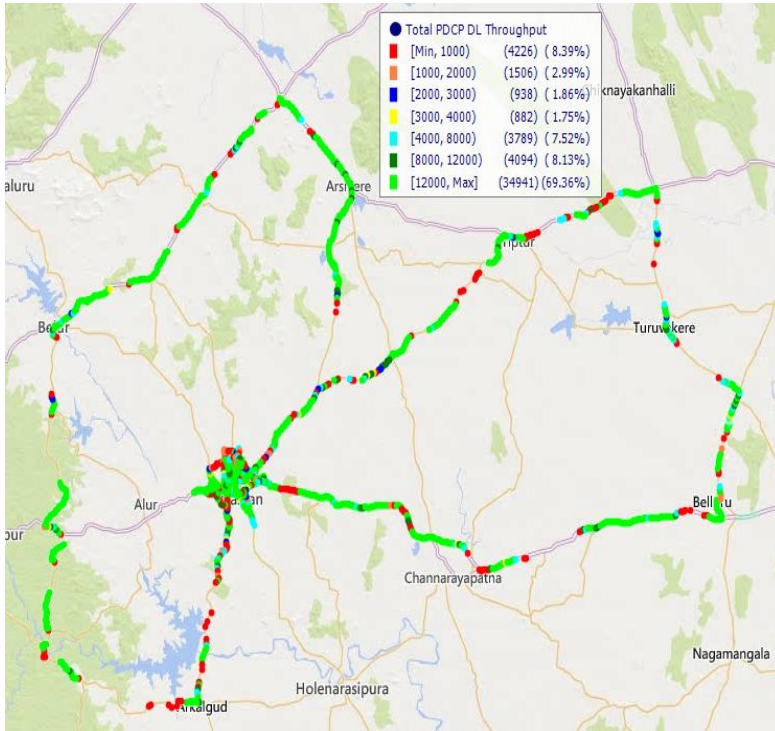
JIO



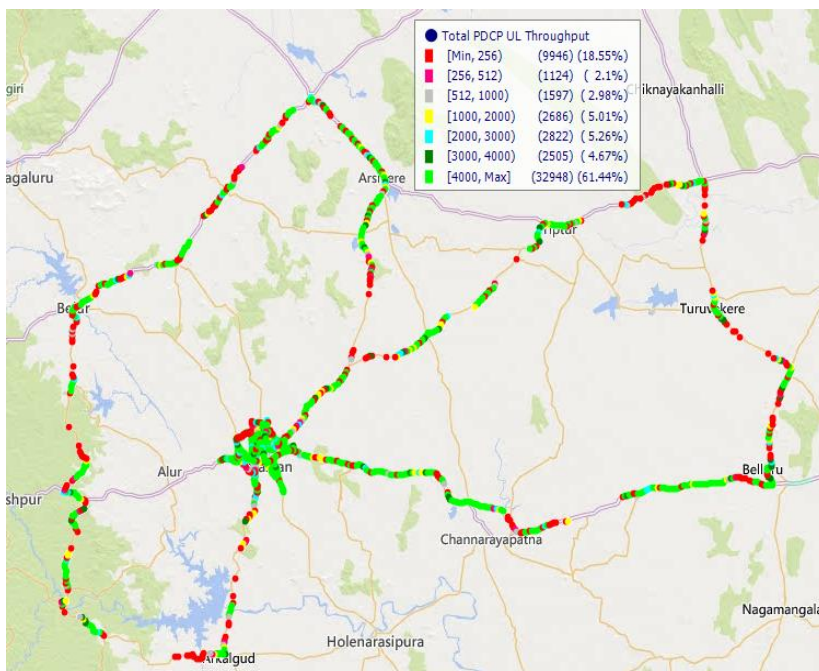
DL throughput	No. of Samples	%
0 to 1 Mbps	6378	13.63
1 to 2 Mbps	2342	5.00
2 to 3 Mbps	2418	5.17
3 to 4 Mbps	2487	5.32
4 to 8 Mbps	8222	17.57
8 to 12 Mbps	6565	14.03
>12 Mbps	18383	39.28
Total	46795	100

IV. Dynamic Data Test (Data Test on Move)- 4G DL/UL Details

VIL



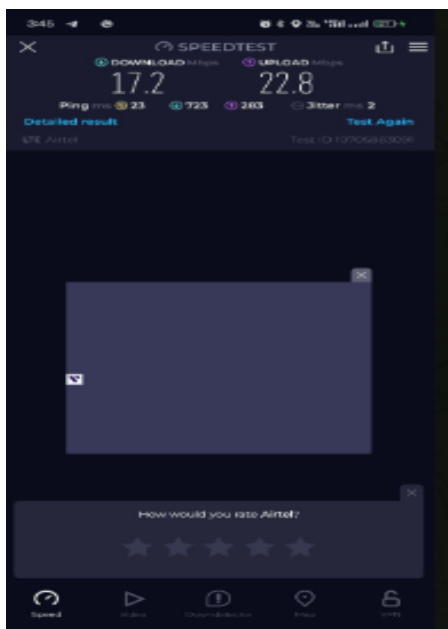
DL throughput	No. of Samples	%
0 to 1 Mbps	4226	8.39
1 to 2 Mbps	1506	2.99
2 to 3 Mbps	938	1.86
3 to 4 Mbps	882	1.75
4 to 8 Mbps	3789	7.52
8 to 12 Mbps	4094	8.13
>12 Mbps	34941	69.36
Total	50376	100



Upload throughput	No. of Samples	%
0 to 256 kbps Mbps	9946	18.55
256 to 512 kbps	1124	2.10
512 Kbps to 1 Mbps	1597	2.98
1 to 2 Mbps	2686	5.01
2 to 3 Mbps	2822	5.26
3 to 4 Mbps	2505	4.67
>4Mbps	32948	61.44
Total	53628	100

Techology-4G/VoLTE	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6
Download Speed	17.2	23.9	10.8	9.76	17.0	31.0
Upload Speed	22.8	14.4	1.14	1.9	15.8	9.47
Latency	23	27	31	27	25	32

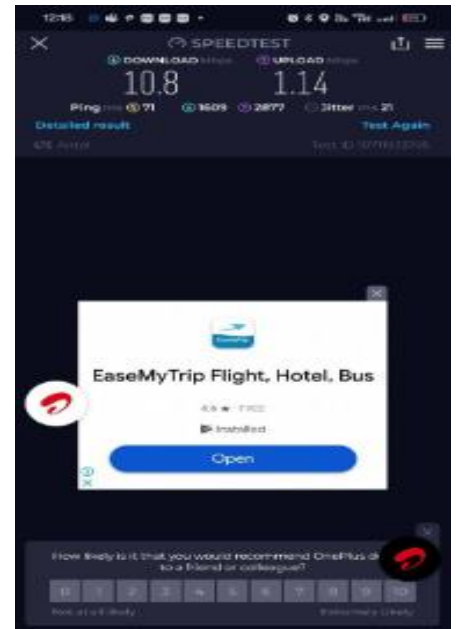
1. Hasanamba Temple



2. Maharaja Park



3. New Bus Stand



4. GOV Science college



5. RTO



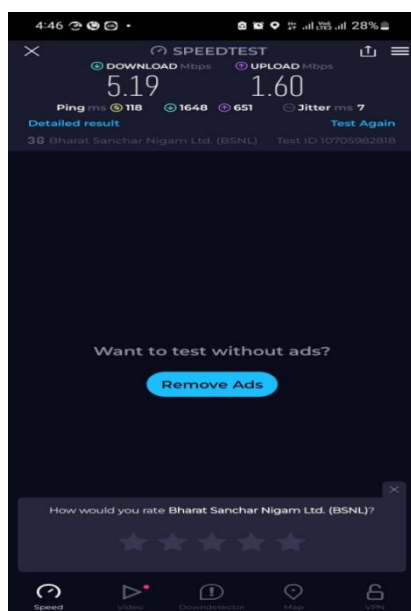
6. Railway Station



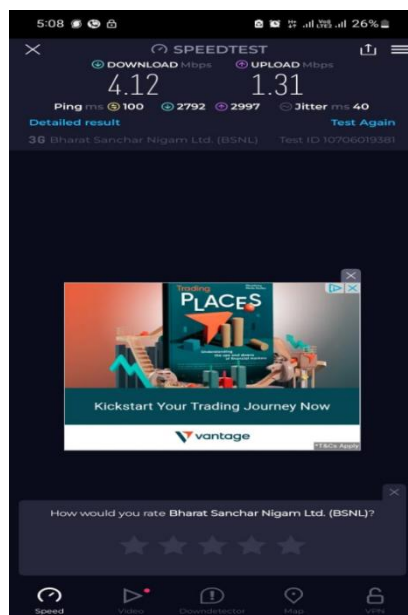
V. TRAI My Speed App Test Details- 3G/4G

Technology-3G	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6
Download Speed (Mbps)	5.19	4.12	1.45	2.99	6.74	6.25
Upload Speed (Mbps)	1.60	1.31	1.11	0.96	1.60	1.67
Latency (ms)	118	100	230	131	252	84

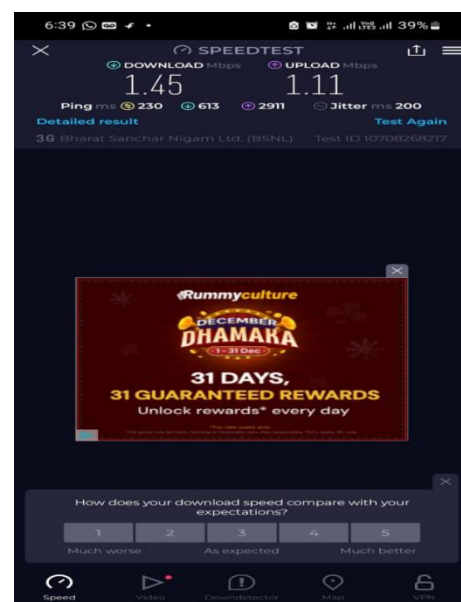
Loc 1



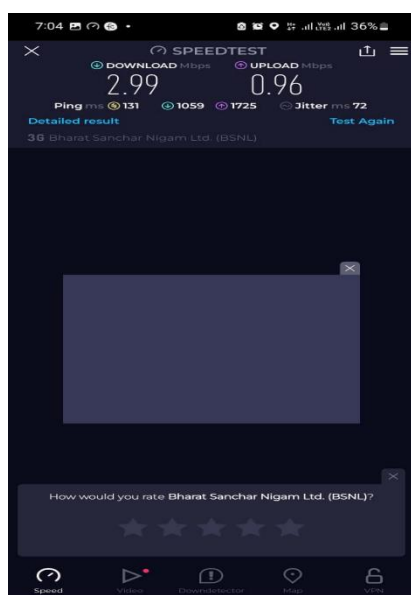
Loc 2



Loc 3



Loc 4



Loc 5



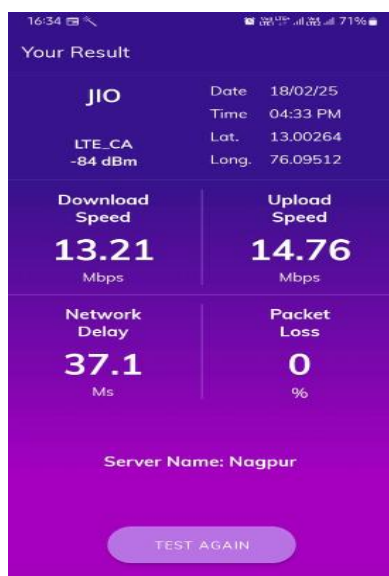
Loc 6



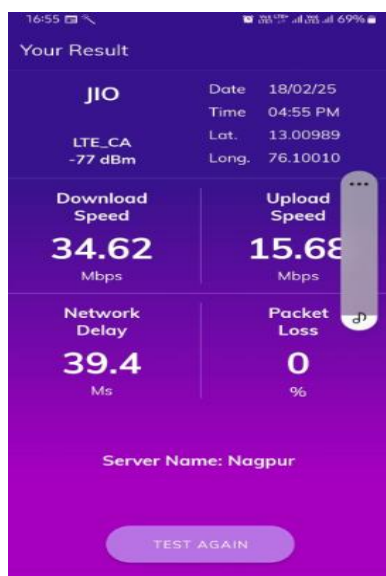
V. TRAI My Speed App Test Details-4G

Techology-4G/VoLTE	Hasanamba Temple	Maharaja Park	Govt.Science College	Hassan KSRTC Bus Stand	Hassan Railway Junction	RTO office Hassan
Download Speed	13.21	34.62	42.93	13.88	9.55	16.70
Upload Speed	14.76	15.68	17.98	6.72	13.02	3.37
Latency	37.1	39.4	62.9	71.3	97.6	67.5

Hasanamba Temple



Maharaja Park



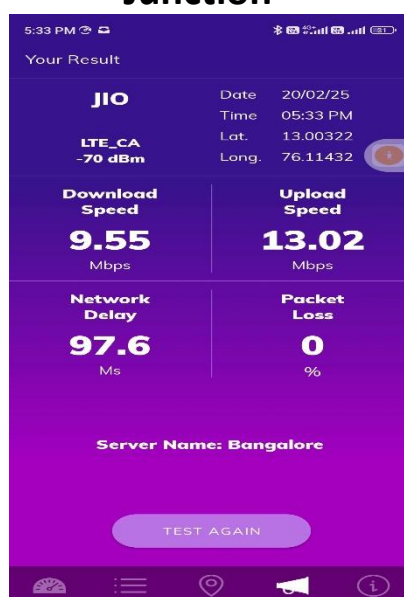
Govt.Science College



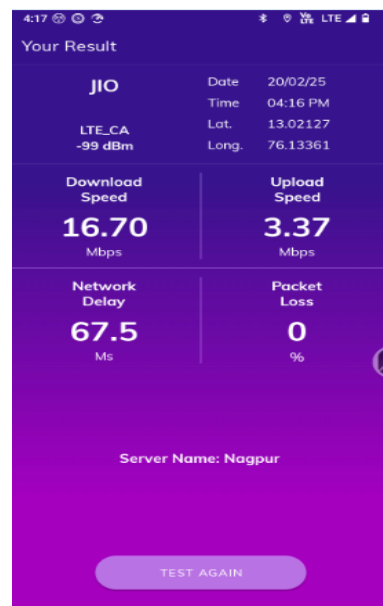
Hassan KSRTC Bus Stand



Hassan Railway Junction



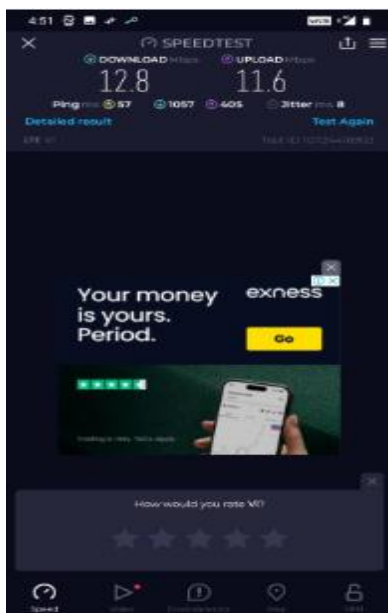
RTO office Hassan



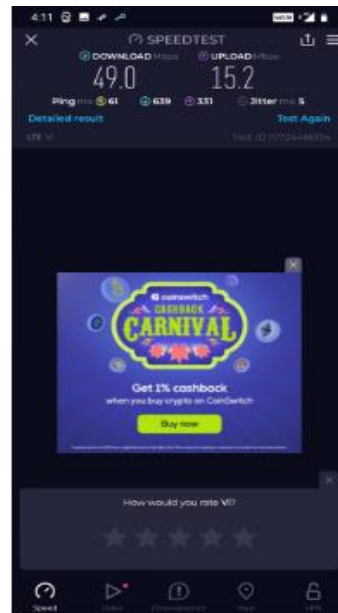
V. TRAI My Speed App Test Details-4G

Techology-4G/VoLTE	Government Science College, Hassan	Hasanamba Temple, Hassan	Hassan Railway Junction	KSRTC Bus Stand, Hassan	Maharaja Park, Hassan	RTO Office, Hassan
Download Speed	12.80	49.00	37.80	29.80	34.30	37.50
Upload Speed	11.60	15.20	9.41	15.00	14.00	13.80
Latency	57	61	53	86	47	82

Govt Science college



Hasanamba Temple



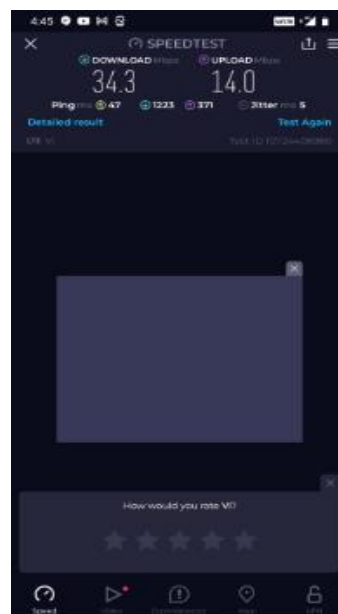
Hassan Railway Junction



KSRTC BUS Stand



Maharaja Park



RTO Office Hassan

