

Operator Assisted Drive Test Report

For

Kalaburagi

14th to 17th Feb 2024

Kalaburgi – Bidar (NH/SH) - 175 Kms

(14th Feb 2024)

Kalaburgi & Surrounding Area - 295 Kms

(15th to 17th Feb 2024)

TRAI RO, Bengaluru

Key Performance Indicators:

- All TSPs have met the 2% QOS benchmark of Drop Call Rate.
- All TSPs have met the 3% QOS benchmark of Call Block Rate.
- All 2G/3G/4G TSPs have not met the $\geq 95\%$ Rx Quality except BSNL 2G and VIL 3G.
- All 2G/3G/4G TSPs have met the $\geq 95\%$ 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 **14th to 17th Feb 2024**. The drive test covered the route of **470 Kms** including NH/SH of **175 Kms** & **6** hotspots. Approximately **600** calls were made for each of the **9** networks: three 2G networks, Two 3G network, and four LTE networks covering four TSPs.

Overview

Voice
Summary

Data
Summary

Overview

Regional Office, TRAI Bengaluru conducted Operator Assisted Drive Test from **14th to 17th Feb 2024** covering various locations in **Kalaburgi & 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 **470 Kms** including NH/SH of **175 Kms** over a period of 4 days from **14th to 17th Feb 2024**. Approximately **600** calls were made for each of the 9 networks: three 2G (Lock Mode) networks, Two 3G (Dual mode) network, and four 4G networks covering 4 unique TSPs.

Data Tests: Dynamic data test (Test Data on Move) was conducted for **470 Kms** including NH/SH of **175 Kms** over a period of 4 days for download throughput for 3G & 4G technology. Data Tests were performed at 6 static locations of 8 networks; three 2G (Lock mode) networks, one 3G (Dual mode) network, and four 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.**

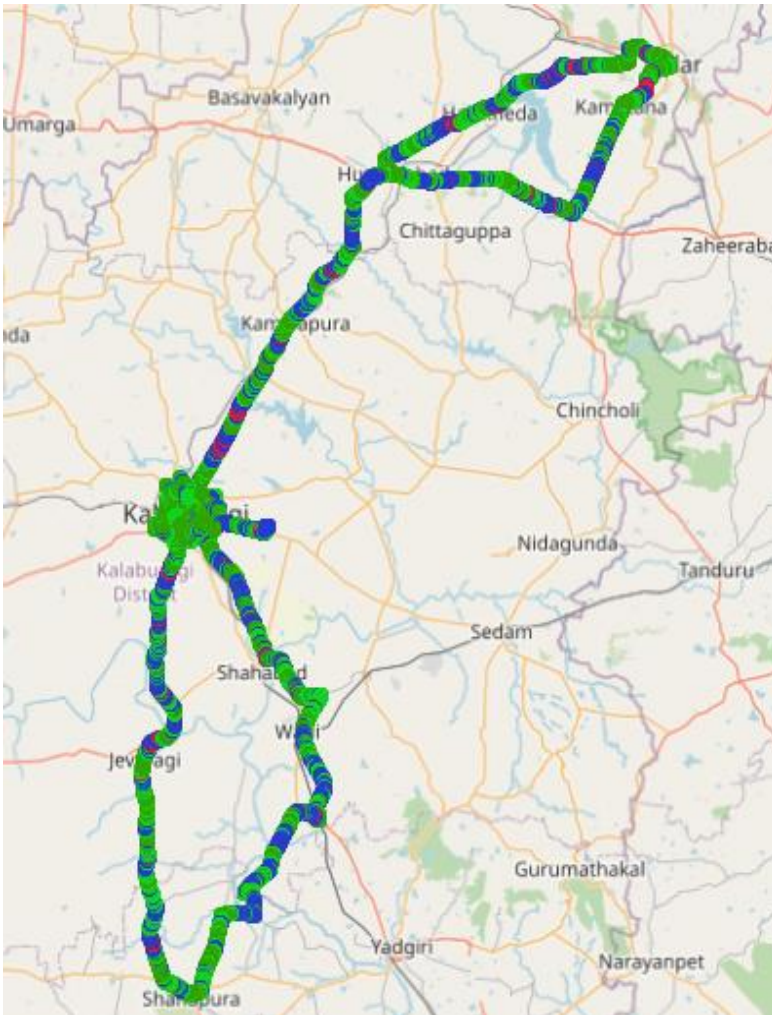
* For Voice and Data KPI's, 2G measurement is done with UE locked on 2G, 3G measurement is done with UE in Dual mode (2G & 3G) and 4G measurement is done with UE in Free Mode.

* 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.

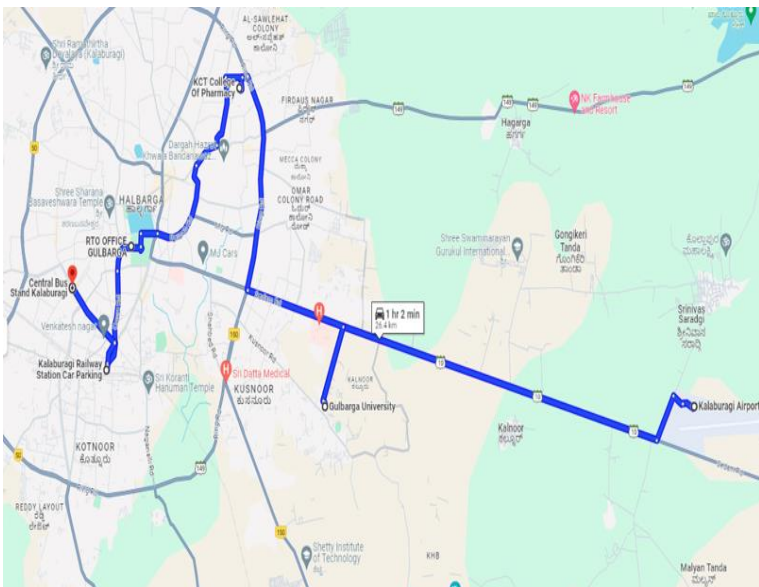
| Service | Specifications |
|-----------------|---|
| Download | 2G (Locked) - 500KB, 3G (Dual) - 20 MB, 4G (Free) - 40 MB |
| Upload | 2G (Locked) - 100KB, 3G (Dual) - 5 MB, 4G (Free) - 10 MB |
| Web Browsing | 3 links of e/m commerce website www.amazon.in , www.flipkart.com and PayTm |
| Latency |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

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



| Areas covered | |
|---------------|-----------|
| Gubarga | Bhankoor |
| Aurad | Shahbad |
| Kamalapur | wadi |
| Humnabad | Nalwar |
| Helikhed b | kollur |
| Andur | shirwal |
| Bidar | Allisagar |
| Bagdal | shahpur |
| Mannekhalli | C cross |
| Humnabad | Jewargi |

Data Service Test- Static Locations



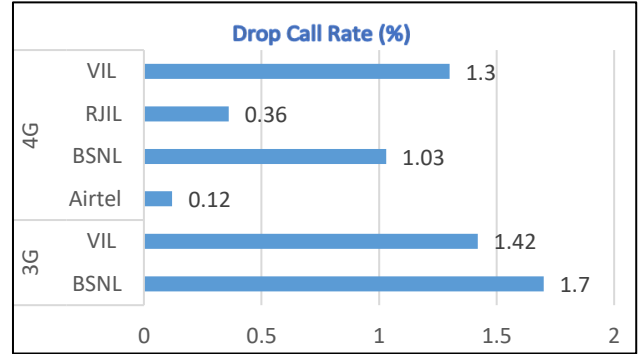
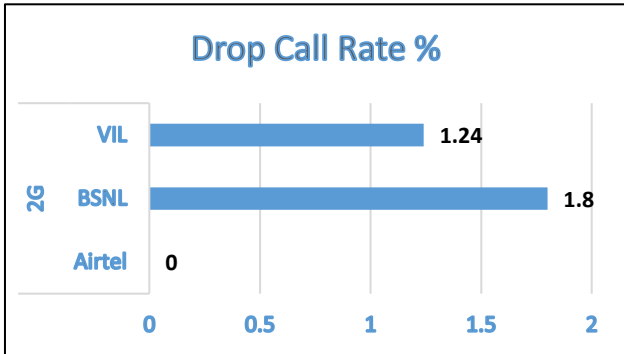
| |
|------------------------|
| 1. Airport |
| 2. Gulbarga University |
| 3.KCT Pharmacy |
| 4. RTO Gulbarga |
| 5. Railway station |
| 6. Central Busstand |

Voice Calls

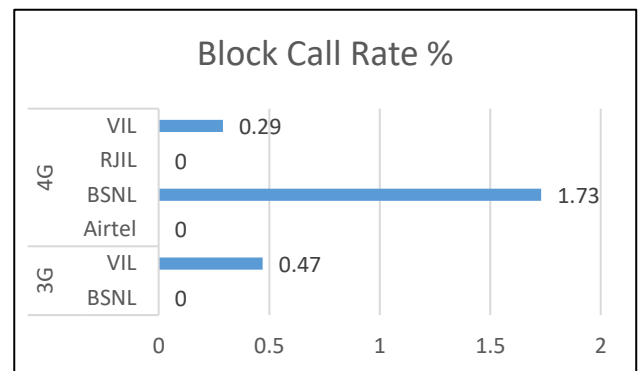
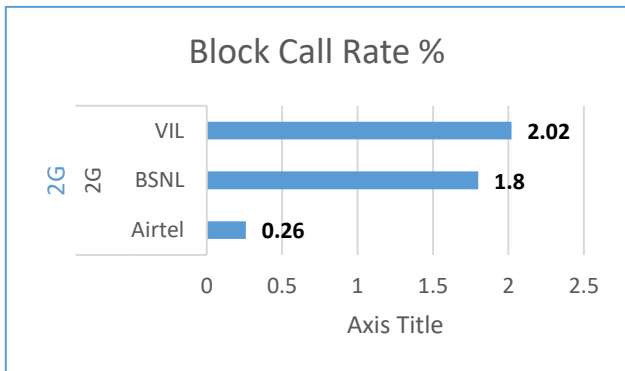
Key Observations

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 | VIL | Airtel | BSNL | RJIL | VIL |
| Drop Call Rate % | 0 | 1.8 | 1.24 | 1.7 | 1.42 | 0.12 | 1.03 | 0.36 | 1.3 |
| Block Call Rate % | 0.26 | 1.8 | 2.02 | 0 | 0.47 | 0 | 1.73 | 0 | 0.29 |

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate.
- 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% | 84.97 | 74.00 | 80.51 |

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

| TSPs | 3G | | 4G | | | |
|------------|-------|-------|--------|-------|-------|-------|
| | BSNL | VIL | Airtel | BSNL | JIO | VIL |
| Coverage % | 70.00 | 68.92 | 99.33 | 89.00 | 98.39 | 90.95 |

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

| TSPs | 3G | | 4G | | | |
|----------------------|------|-------|--------|------|-----|-------|
| | BSNL | VIL | Airtel | BSNL | JIO | VIL |
| Time Spent on 3G/4G% | 7.2 | 98.71 | 100 | 20.7 | 100 | 99.61 |

Summary

City Level Summary

| Voice Call | 2G | | |
|-----------------------|--------|-------|-------|
| | Airtel | BSNL | VIL |
| Call Attempt | 772 | 815 | 743 |
| Blocked Call Rate (%) | 0.26 | 1.8 | 2.02 |
| CSSR% (Accessibility) | 99.74 | 98.2 | 97.98 |
| Drop Call Rate (%) | 0 | 1.8 | 1.24 |
| Rx Quality (%) | 91.35 | 96 | 93.85 |
| Mobility HOSR (%) | 98.77 | 91.35 | 98.92 |

| Voice Call | 3G/4G | | | | | |
|-----------------------|---------|--------|-----------|---------|--------|--------|
| | BSNL 3G | VIL 3G | Airtel 4G | BSNL 4G | JIO 4G | VIL 4G |
| Call Attempt | 59 | 428 | 808 | 486 | 826 | 695 |
| Blocked Call Rate (%) | 0 | 0.47 | 0 | 1.73 | 0 | 0.29 |
| CSSR% (Accessibility) | 100 | 99.53 | 99.88 | 98.27 | 99.64 | 99.71 |
| Drop Call Rate (%) | 1.7 | 1.42 | 0.12 | 1.03 | 0.36 | 1.3 |
| Rx Quality (%) | 94.39 | 97.78 | 91.19 | 87.1 | 92.65 | 88.26 |
| Mobility HOSR (%) | 98.83 | 99.89 | 99 | 98.2 | 99.31 | 98.77 |

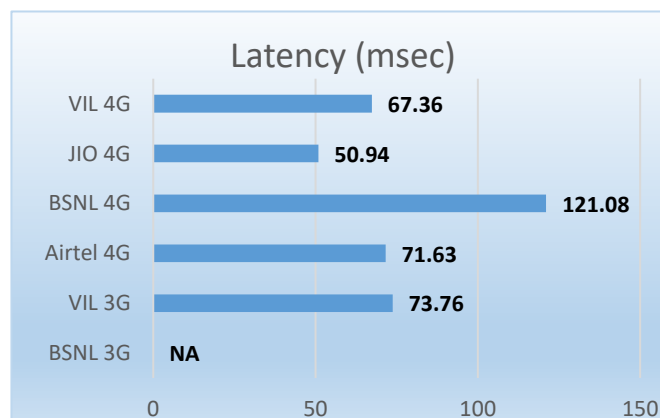
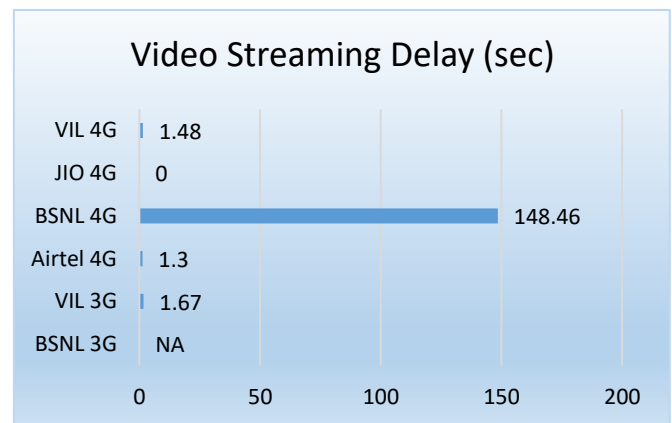
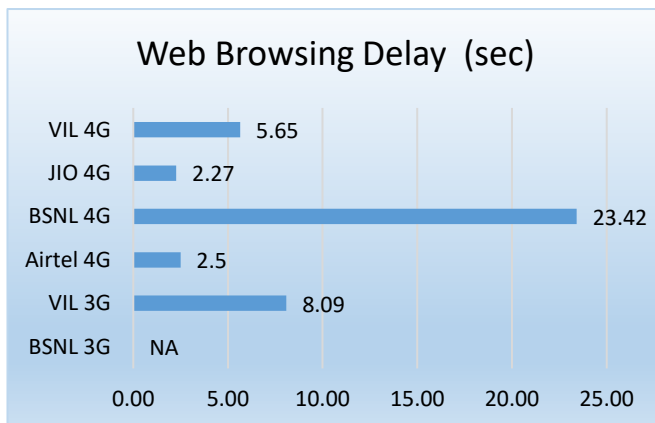
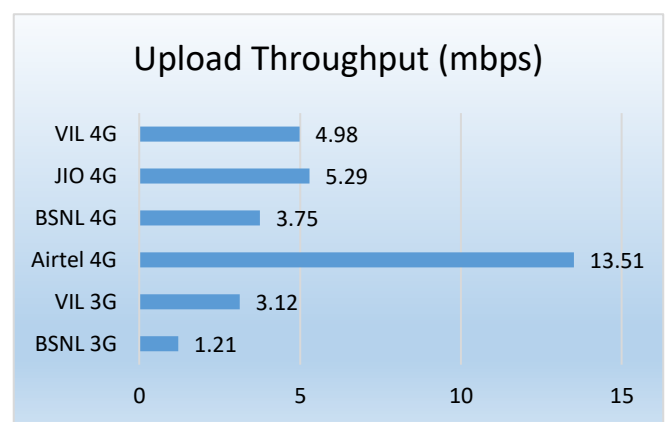
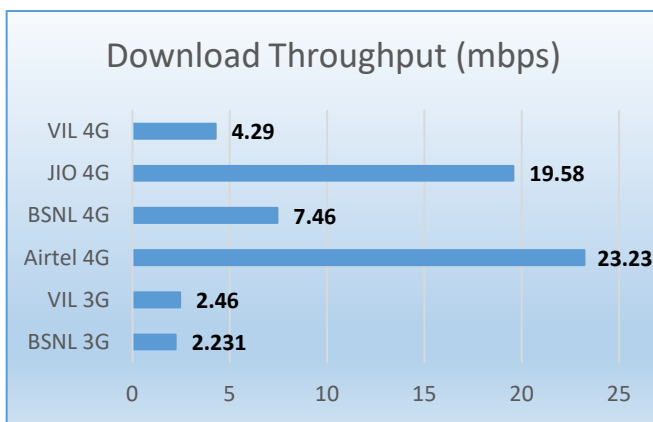
Data Services Static

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 | 2G | | |
|----------------------------|--------|---------|--------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 93.72 | 61.875 | 97.11 |
| Upload Throughput (kbps) | 2.56 | 148.39 | 111.38 |
| Web Browsing Delay (sec) | 72.86 | 173.216 | 47.92 |
| Latency (msec) | 243.7 | 223.9 | 182.83 |

| Data Services Static | 3G | | 4G | | | |
|-----------------------------|---------|--------|-----------|---------|--------|--------|
| | BSNL 3G | VIL 3G | Airtel 4G | BSNL 4G | JIO 4G | VIL 4G |
| Download Throughput (mbps) | 2.231 | 2.46 | 23.23 | 7.46 | 19.58 | 4.29 |
| Upload Throughput (mbps) | 1.21 | 3.12 | 13.51 | 3.75 | 5.29 | 4.98 |
| Web Browsing Delay (sec) | NA | 8.09 | 2.5 | 23.42 | 2.27 | 5.65 |
| Video Streaming Delay (sec) | NA | 1.67 | 1.3 | 148.46 | 0 | 1.48 |
| Latency (msec) | NA | 73.76 | 71.63 | 121.08 | 50.94 | 67.36 |

| Data Services Dynamic (Data Test on Move) | 3G | | 4G | | | |
|---|-------|------|--------|-------|-------|-------|
| | BSNL | VIL | Airtel | BSNL | JIO | VIL |
| Download Throughput (mbps) | 2.214 | 4.23 | 10.86 | 7.102 | 15.08 | 10.03 |
| Upload Throughput (mbps) | 1.12 | NA | 8.11 | 3.73 | 3.15 | NA |

Summary

City Level Data Services Static(contd.)

| Data Services Static – Airport Klaburgi | 2G | | |
|--|--------|--------|--------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 130.4 | 49.37 | 145.66 |
| Upload Throughput (kbps) | 3.04 | 76.14 | 61.86 |
| Web Browsing Delay (sec) | 78.64 | 204.78 | 51.35 |
| Latency (ms) | 262.6 | 216 | 263 |

| Data Services Static – Airport Klaburgi | 3G | 4G | | | |
|--|-----|------|--------|-------|-----|
| | VIL | BSNL | Airtel | JIO | VIL |
| Download Throughput (Mbps) | NA | NA | 19.14 | 12.79 | NA |
| Upload Throughput (Mbps) | NA | NA | 8.09 | 3.31 | NA |
| Web Browsing Delay (sec) | NA | NA | 2.33 | 2.66 | NA |
| Video Streaming Delay (sec) | NA | NA | 0.86 | 0 | NA |
| Latency (ms) | NA | NA | 68.2 | 42.03 | NA |

| Data Services Static – Gulbarga University | 2G | | |
|---|--------|--------|--------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 45.91 | 39.7 | 76.35 |
| Upload Throughput (kbps) | 2.29 | 47.25 | 154.32 |
| Web Browsing Delay (sec) | 57.34 | 201.98 | 54.552 |
| Latency (msec) | 259.6 | 190 | 159 |

| Data Services Static - Gulbarga University | 3G | 4G | | | |
|---|--------|--------|--------|-------|-------|
| | VIL | BSNL | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 2.40 | 2.55 | 30.46 | 15.82 | 3.35 |
| Upload Throughput (Mbps) | 3.53 | 4.68 | 17.45 | 2.95 | 3.20 |
| Web Browsing Delay (sec) | 8.87 | 30.99 | 0.31 | 2.56 | 7.29 |
| Video Streaming Delay (sec) | 2.87 | 148.62 | 1.58 | 0 | 1.42 |
| Latency (ms) | 110.40 | 123.6 | 70.8 | 56 | 53.60 |

Summary

City Level Data Services Static(contd.)

| Data Services Static – KCT College of Pharmacy | 2G | | |
|---|--------|--------|---------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 93.78 | 90.04 | 89.87 |
| Upload Throughput (kbps) | 2.26 | 192.23 | 124.036 |
| Web Browsing Delay (sec) | 55.91 | 196.80 | 39.016 |
| Latency (ms) | 262 | 190.80 | 220 |

| Data Services Static – KCT College of Pharmacy | 3G | 4G | | | |
|---|------|--------|--------|-------|------|
| | VIL | BSNL | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 2.89 | 12.44 | 5.91 | 14.75 | 4 |
| Upload Throughput (Mbps) | 3.8 | 4.91 | 13.63 | 6.43 | 2.33 |
| Web Browsing Delay (sec) | 7.25 | 21.01 | 2.51 | 2.16 | 5.08 |
| Video Streaming Delay (sec) | 1.53 | 150.29 | 1.31 | 0 | 0.73 |
| Latency (ms) | 75 | 146.40 | 70 | 62 | 80 |

| Data Services Static – RTO Office Gulbarga | 2G | | |
|---|--------|--------|--------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 114.38 | 59.97 | 82.31 |
| Upload Throughput (kbps) | 1.62 | 172.85 | 71.116 |
| Web Browsing Delay (sec) | 60.09 | 174.46 | 55.486 |
| Latency (msec) | 211 | 194 | 160 |

| Data Services Static – RTO Office Gulbarga | 3G | 4G | | | |
|---|------|--------|--------|-------|-------|
| | VIL | BSNL | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 3.05 | 4.91 | 33.46 | 30.16 | 2.05 |
| Upload Throughput (Mbps) | 2.93 | 1.77 | 21.21 | 7.29 | 12.37 |
| Web Browsing Delay (sec) | 5.81 | 21.12 | 4.03 | 2.45 | 3.06 |
| Video Streaming Delay (sec) | 1.79 | 147.79 | 2.49 | 0 | 1.87 |
| Latency (ms) | 71 | 77.6 | 81 | 55 | 71 |

Summary

City Level Data Services Static(contd.)

| Data Services Static – Railway Station Gulbarga | 2G | | |
|--|--------|--------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 116.78 | 70.24 | 76.93 |
| Upload Throughput (kbps) | 2.1 | 221.83 | 93.38 |
| Web Browsing Delay (sec) | 75.17 | 196.80 | 37.84 |
| Latency (ms) | 216 | 254.80 | 149 |

| Data Services Static – Railway Station Gulbarga | 3G | 4G | | | |
|--|------|-------|--------|-------|------|
| | VIL | BSNL | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 2.29 | 4.95 | 34.77 | 29.09 | 8.39 |
| Upload Throughput (Mbps) | 3.98 | 2.28 | 17.65 | 7.71 | 3.27 |
| Web Browsing Delay (sec) | 8.75 | 28.18 | 2.33 | 1.82 | 6.47 |
| Video Streaming Delay (sec) | 1.02 | 148 | 0.63 | 0 | 1.9 |
| Latency (ms) | 53 | 129.4 | 88 | 34 | 64 |

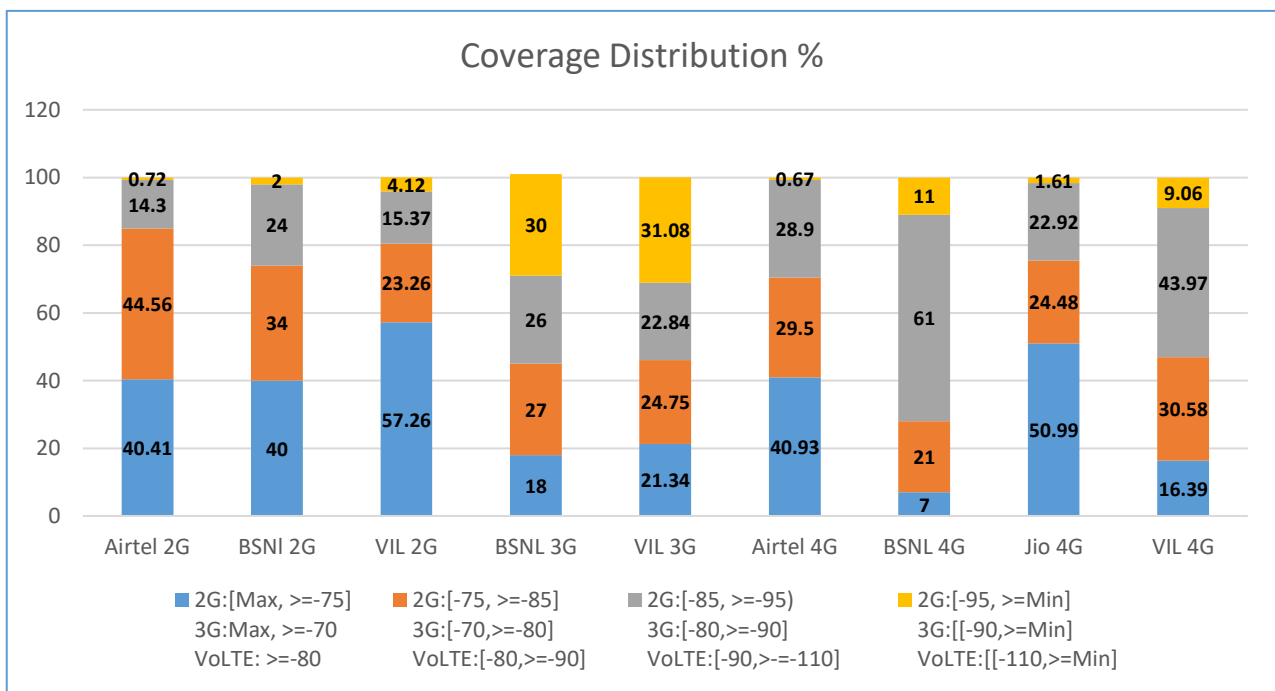
| Data Services Static – Central Bus Stand Gulbarga | 2G | | |
|--|--------|--------|--------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 61.06 | 61.97 | 111.55 |
| Upload Throughput (kbps) | 4.04 | 186.05 | 163.56 |
| Web Browsing Delay (sec) | 110 | 64.48 | 49.26 |
| Latency (msec) | 250.8 | 295.32 | 146 |

| Data Services Static – Central Bus Stand Gulbarga | 3G | 4G | | | |
|--|------|--------|--------|-------|------|
| | VIL | BSNL | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 1.65 | 12.43 | 15.6 | 14.95 | 3.67 |
| Upload Throughput (Mbps) | 1.36 | 5.13 | 3 | 4.05 | 3.71 |
| Web Browsing Delay (sec) | 9.75 | 15.76 | 3.5 | 2 | 6.36 |
| Video Streaming Delay (sec) | 1.15 | 147.59 | 0.92 | 0 | 1.49 |
| Latency (ms) | 59 | 128.38 | 51 | 56 | 68 |

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 | 84.97 |
| BSNI 2G | 74.00 |
| VIL 2G | 80.51 |
| BSNL 3G | 70.00 |
| VIL 3G | 68.92 |
| Airtel VoLTE | 99.33 |
| BSNL 4G | 89.00 |
| Jio VoLTE | 98.39 |
| VIL VoLTE | 90.95 |

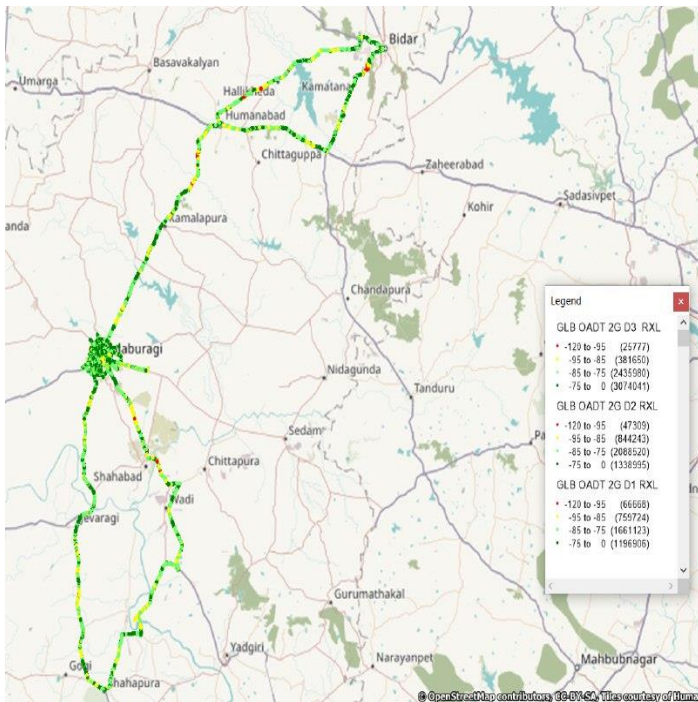


I. Coverage Details

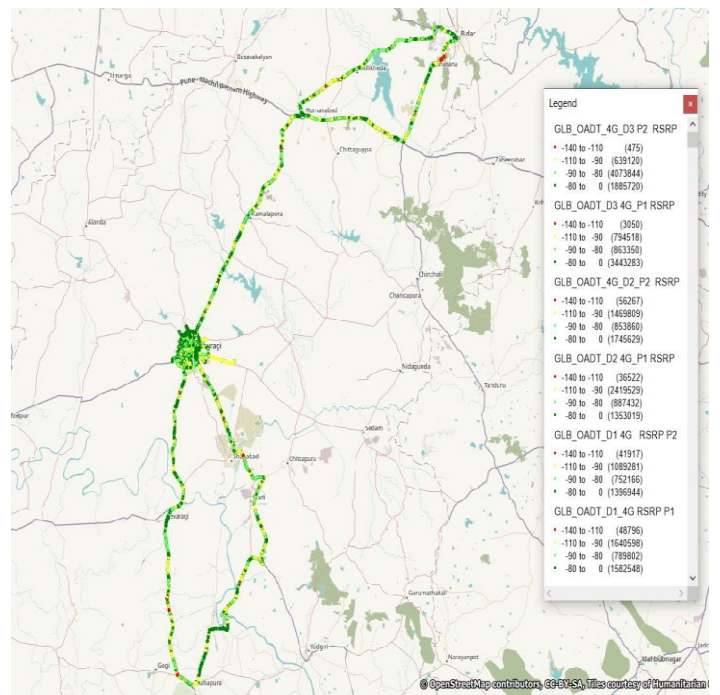
AIRTEL

| Technology | Coverage Rate % |
|------------|-----------------|
| 2G | 84.97 |
| 4G | 99.33 |

2G



4G



2G

| Overall RxLevel | # Samples | % PDF |
|-----------------|-----------------|------------|
| [Max, >=-75] | 5609942 | 40.41 |
| [-75, >=-85) | 6185623 | 44.56 |
| [-85, >=-95) | 1985617 | 14.30 |
| [-95, >=Min) | 99754 | 0.72 |
| Total | 13880936 | 100 |

4G/VoLTE

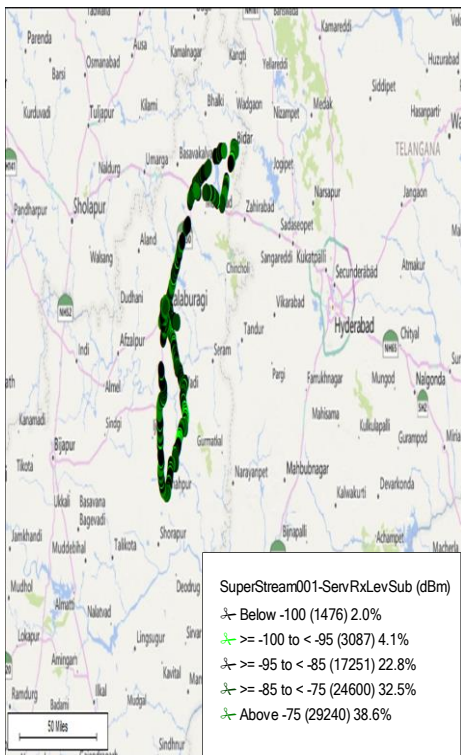
| Overall RSRP | # Samples | % PDF |
|---------------|-----------------|------------|
| [Max, >=-80] | 11407143 | 40.93 |
| [-80, >=-90) | 8220454 | 29.50 |
| [-90, >=-110) | 8052855 | 28.90 |
| [-110, >=Min) | 187027 | 0.67 |
| Total | 27867479 | 100 |

I. Coverage Details

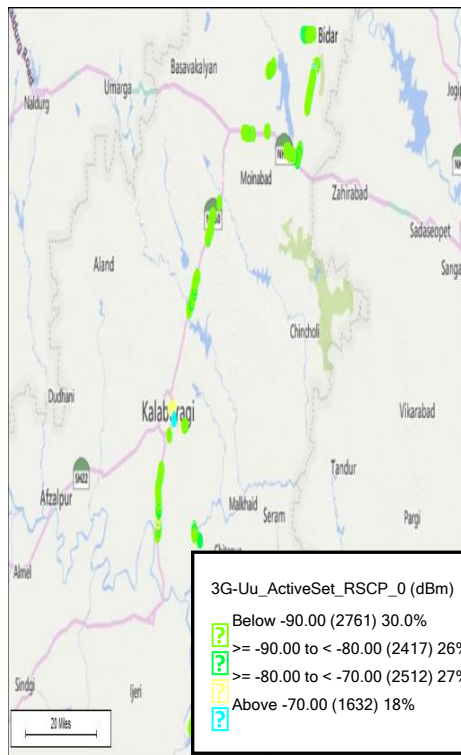
BSNL

| Technology | Coverage Rate % |
|------------|-----------------|
| 2G | 74 |
| 3G | 70 |
| 4G | 89 |

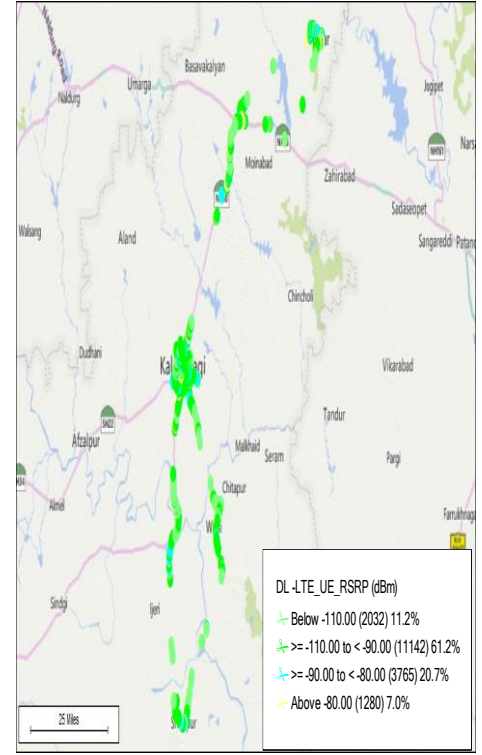
2G



3G



4G



| 2G | | |
|-----------------|--------------|------------|
| Overall RxLevel | # Samples | % PDF |
| [Max, >=-75] | 29240 | 40 |
| [-75, >=-85] | 24600 | 34 |
| [-85, >=-95] | 17251 | 24 |
| [-95, >=Min] | 1476 | 2 |
| Total | 72567 | 100 |

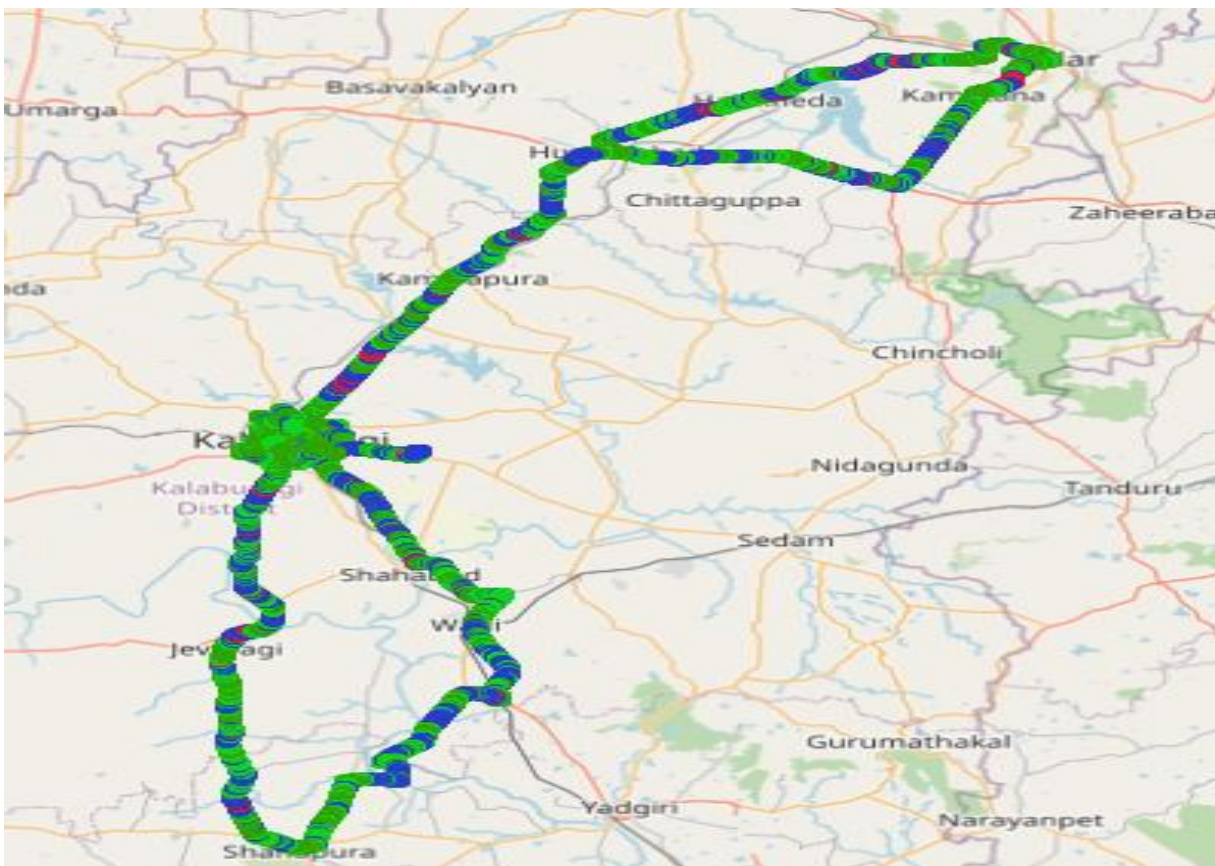
| 3G | | |
|--------------|-------------|------------|
| Overall RSCP | # Samples | % PDF |
| [Max, >=-70] | 1632 | 18 |
| [-70, >=-80] | 2512 | 27 |
| [-80, >=-90] | 2417 | 26 |
| [-90, >=Min] | 2761 | 30 |
| Total | 9332 | 100 |

| 4G | | |
|---------------|--------------|------------|
| Overall RSRP | # Samples | % PDF |
| [Max, >=-80] | 1280 | 7 |
| [-80, >=-90] | 3765 | 21 |
| [-90, >=-110] | 11142 | 61 |
| [-110, >=Min] | 2032 | 11 |
| Total | 14907 | 100 |

I. Coverage Details

JIO

| Technology | Coverage Rate % |
|------------|-----------------|
| 4G | 98.39 |



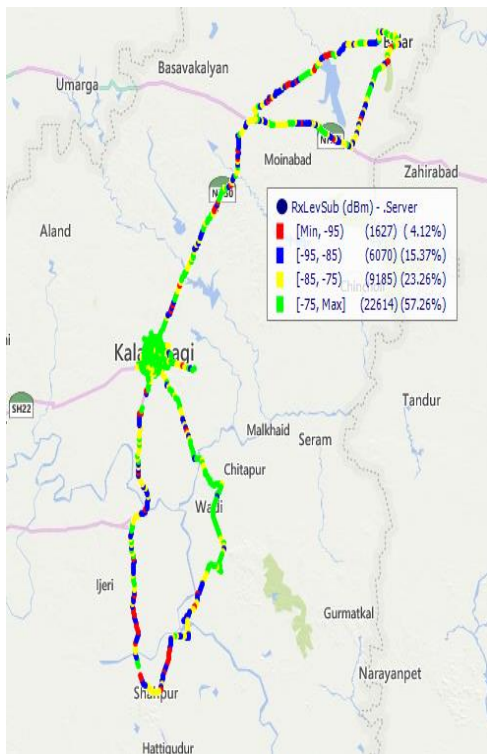
| 4G/VoLTE | | |
|---------------|--------------|------------|
| Overall RSRP | # Samples | % PDF |
| [Max, >=-80] | 47226 | 50.99 |
| [-80, >=-90) | 22670 | 24.48 |
| [-90, >=-110) | 21223 | 22.92 |
| [-110, >=Min) | 1493 | 1.61 |
| Total | 92612 | 100 |

I. Coverage Details

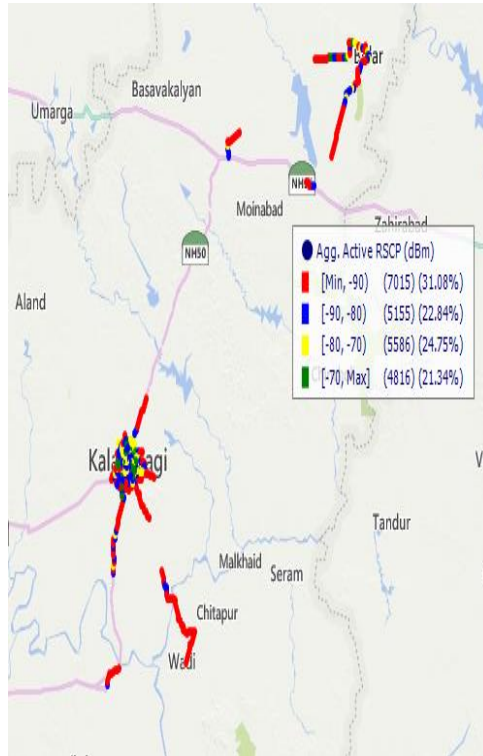
VIL

| Technology | Coverage Rate % |
|------------|-----------------|
| 2G | 80.51 |
| 3G | 68.92 |
| 4G | 90.95 |

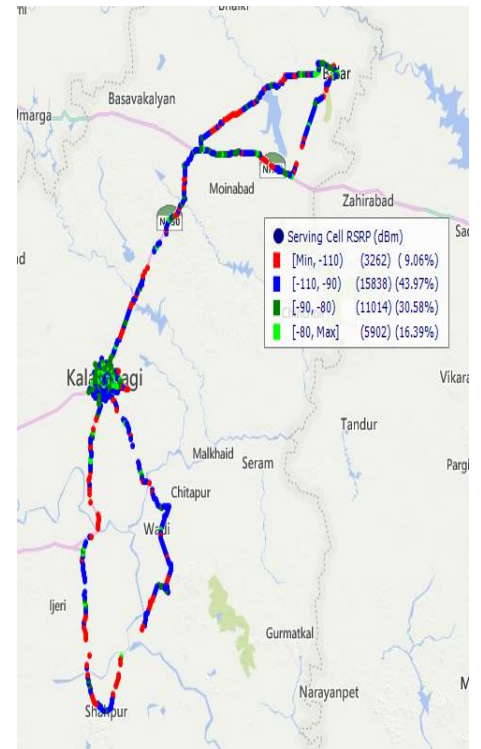
2G



3G



4G



| 2G | | |
|-----------------|--------------|---------------|
| Overall RxLevel | # Samples | % PDF |
| [Max, >=-75] | 22614 | 57.26 |
| [-75, >=-85] | 9185 | 23.26 |
| [-85, >=-95] | 6070 | 15.37 |
| [-95, >=Min] | 1627 | 4.12 |
| Total | 39496 | 100.00 |

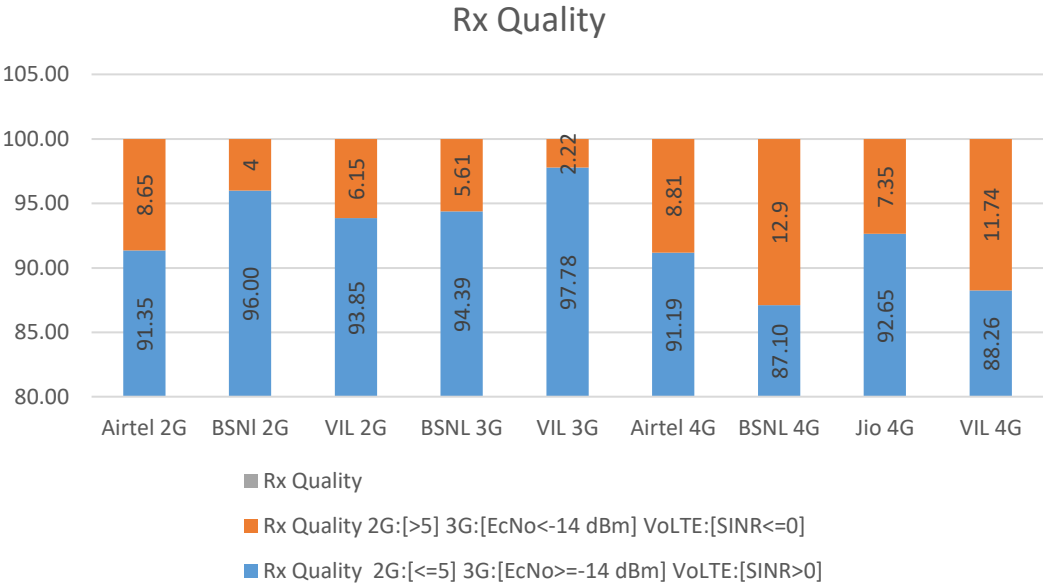
| 3G | | |
|--------------|--------------|---------------|
| Overall RSCP | # Samples | % PDF |
| [Max, >=-70] | 4816 | 21.34 |
| [-70, >=-80] | 5586 | 24.75 |
| [-80, >=-90] | 5155 | 22.84 |
| [-90, >=Min] | 7015 | 31.08 |
| Total | 22572 | 100.00 |

| 4G | | |
|---------------|--------------|---------------|
| Overall RSRP | # Samples | % PDF |
| [Max, >=-80] | 5902 | 16.39 |
| [-80, >=-90] | 11014 | 30.58 |
| [-90, >=-110] | 15838 | 43.97 |
| [-110, >=Min] | 3262 | 9.06 |
| Total | 36016 | 100.00 |

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 $\geq 95\%$.

| TSP | Rx Quality % |
|-----------|--------------|
| Airtel 2G | 91.35 |
| BSNI 2G | 96.00 |
| VIL 2G | 93.85 |
| BSNL 3G | 94.39 |
| VIL 3G | 97.78 |
| Airtel 4G | 91.19 |
| BSNL 4G | 87.10 |
| Jio 4G | 92.65 |
| VIL 4G | 88.26 |

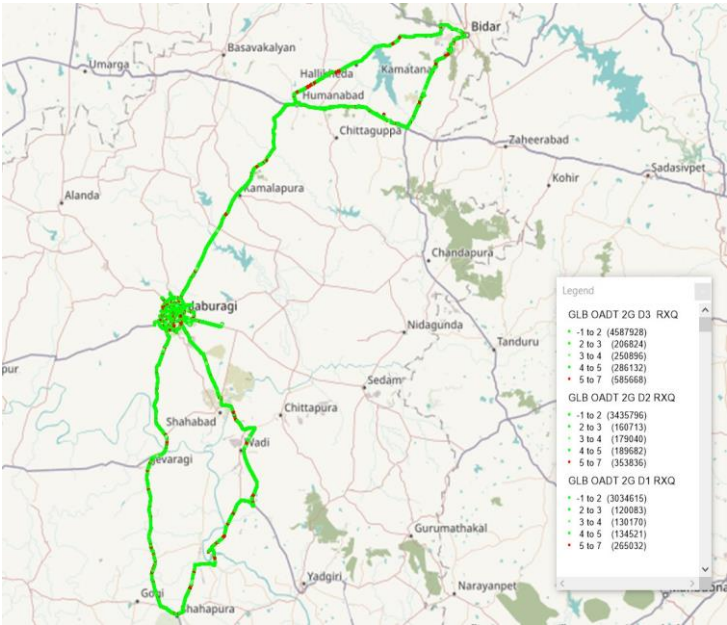


II. Quality Details

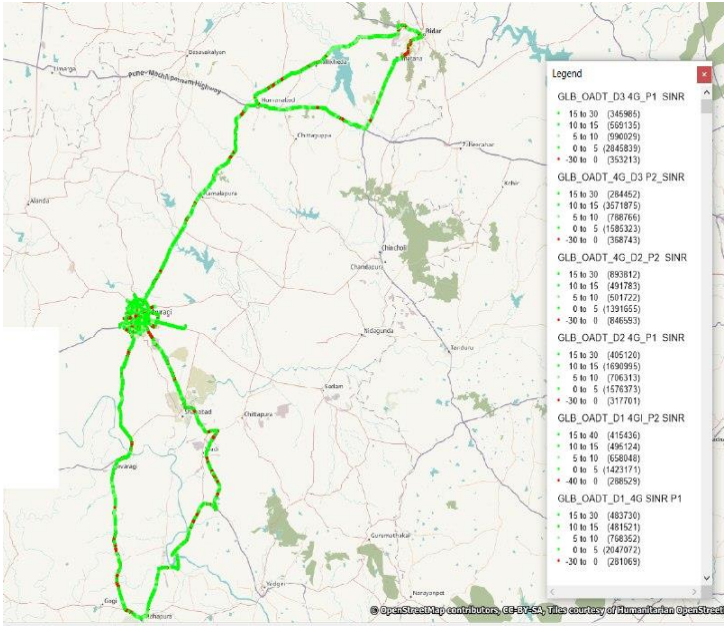
Airtel

| Technology | Rx Quality % |
|------------|--------------|
| 2G | 91.35 |
| 4G | 91.19 |

2G



4G



| Overall Rx Quality | # Samples | % PDF |
|--------------------|-----------------|------------|
| (Min, <=2) | 11058339 | 79.43 |
| (2, <=3) | 487620 | 3.50 |
| (3, <=4) | 560106 | 4.02 |
| (4, <=5) | 611027 | 4.39 |
| (5, <=Max) | 1204536 | 8.65 |
| Total | 13921628 | 100 |

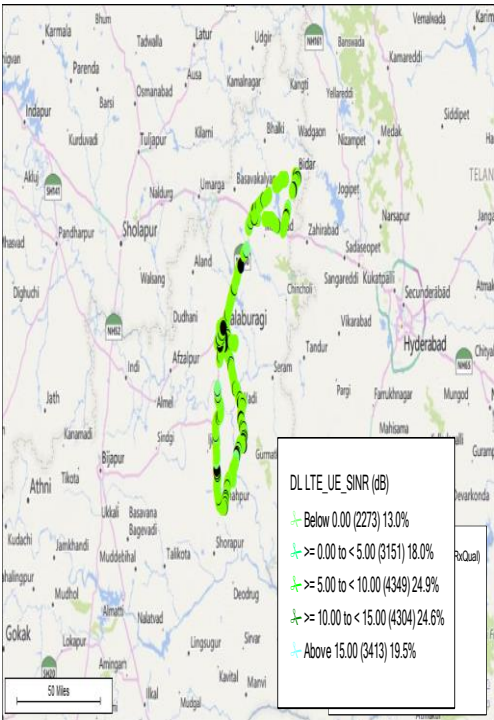
| Overall SINR | # Samples | % PDF |
|--------------|-----------------|------------|
| (Min, <=0) | 2455848 | 8.81 |
| (0, <=5) | 10869433 | 39.00 |
| (5, <=10) | 4413230 | 15.84 |
| (10, <=15) | 7300433 | 26.20 |
| (15, <=Max) | 2828575 | 10.15 |
| Total | 25411671 | 100 |

II. Quality Details

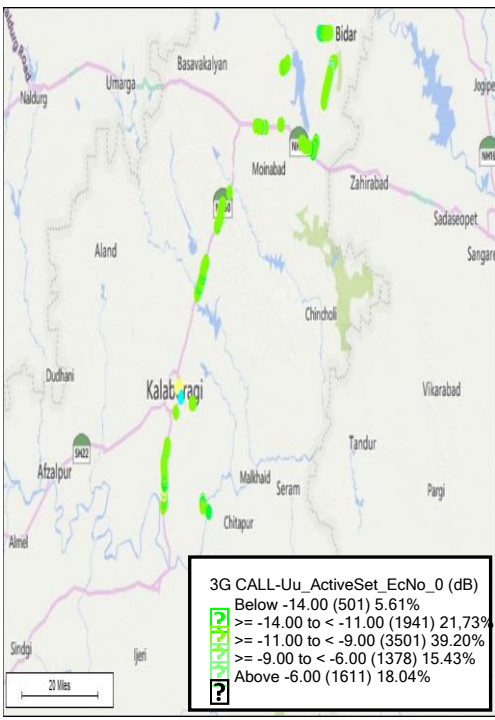
BSNL

| Technology | Rx Quality % |
|------------|--------------|
| 2G | 96 |
| 3G | 94.39 |
| 4G | 87.10 |

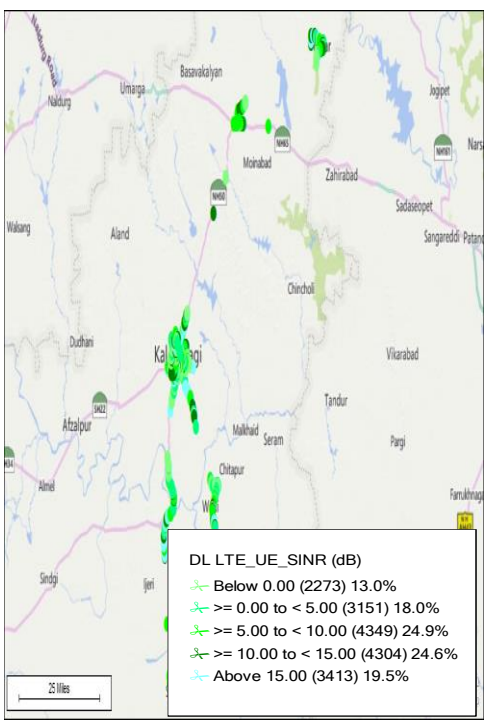
2G



3G



4G



| Overall Rx Quality | # Samples | % PDF |
|--------------------|--------------|------------|
| (Min, <=2) | 64358 | 85 |
| (2, <=3) | 3500 | 5 |
| (3, <=4) | 3381 | 4 |
| (4, <=5) | 1699 | 2 |
| (5, <=Max) | 2716 | 4 |
| Total | 75654 | 100 |

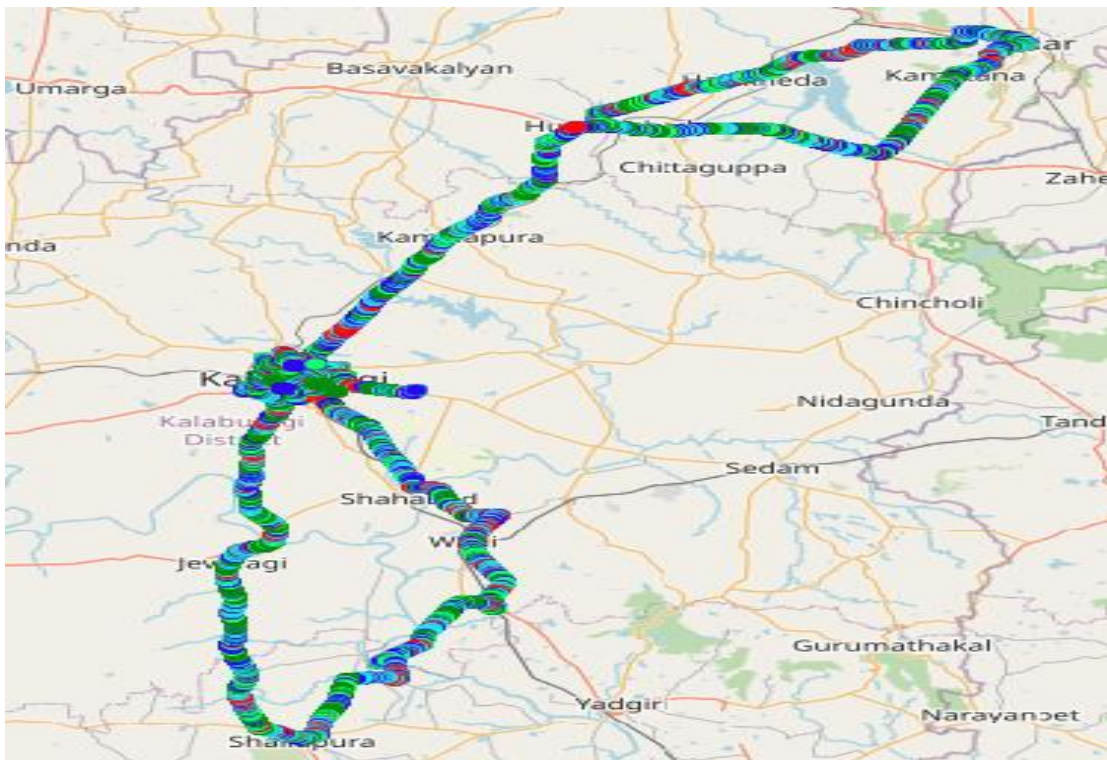
| Overall EcNo | # Samples | % PDF |
|---------------|-------------|------------|
| (Max, <=-6) | 1611 | 18.04 |
| (-6, <=-9) | 1378 | 15.43 |
| (-9, <=-11) | 3501 | 39.20 |
| (-11, <=-14) | 1941 | 21.73 |
| (-14, <= Min) | 501 | 5.61 |
| Total | 8943 | 100 |

| Overall SINR | # Samples | % PDF |
|--------------|--------------|------------|
| (MIN, <=0) | 5630 | 12.9 |
| (0, <=5) | 8921 | 20.4 |
| (5, <=10) | 8665 | 19.8 |
| (10, <=15) | 7006 | 16 |
| (15, <= Min) | 13588 | 31 |
| Total | 43810 | 100 |

II. Quality Details

JIO

| Technology | Rx Quality (%) |
|------------|----------------|
| 4G/4G | 92.65 |



| Overall SINR | # Samples | % PDF |
|--------------|--------------|------------|
| (Min, <=0) | 6805 | 7.35 |
| (0, <=5) | 17811 | 19.23 |
| (5, <=10) | 23182 | 25.03 |
| (10, <=15) | 19975 | 21.57 |
| (15, <=Max) | 24839 | 26.82 |
| Total | 92612 | 100 |

II. Quality Details

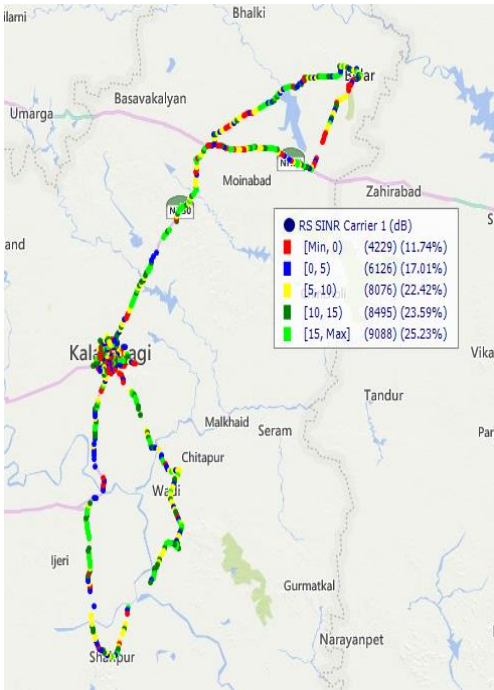
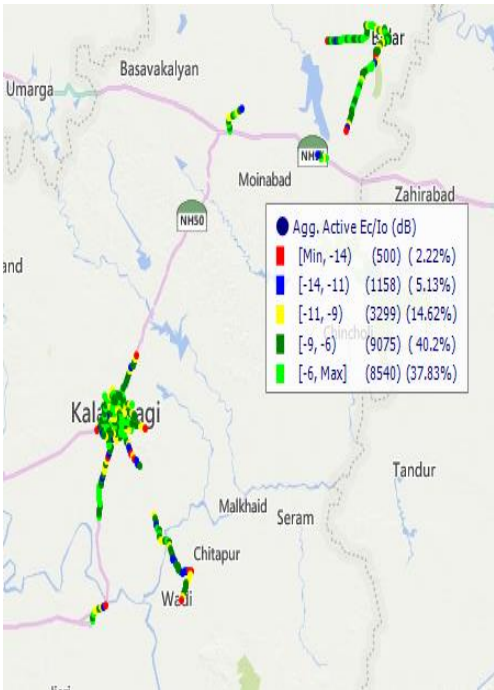
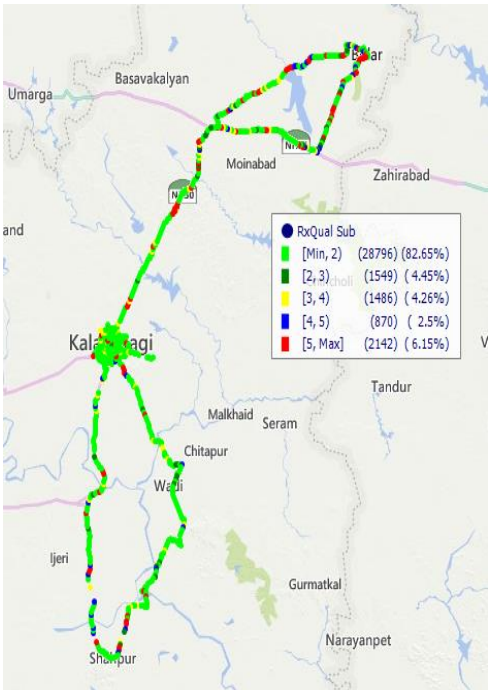
VIL

| Technology | Rx Quality % |
|------------|--------------|
| 2G | 93.85 |
| 3G | 97.78 |
| 4G | 88.26 |

2G

3G

4G



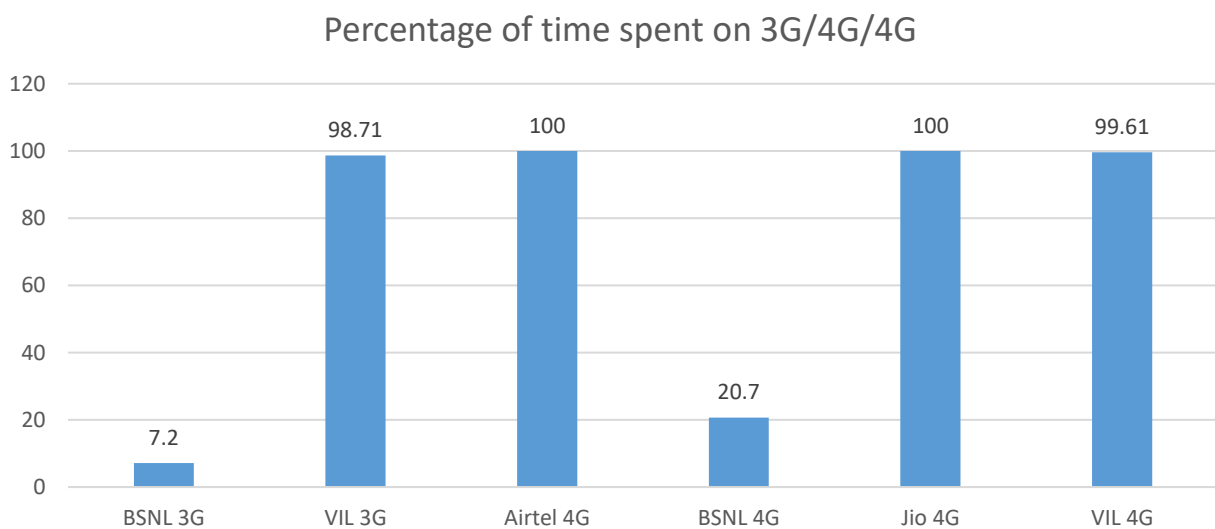
| Overall Rx Quality | # Samples | % PDF |
|--------------------|--------------|---------------|
| (Min, <=2) | 28796 | 82.65 |
| (2, <=3) | 1549 | 4.45 |
| (3, <=4) | 1486 | 4.26 |
| (4, <=5) | 870 | 2.50 |
| (5, <=Max) | 2142 | 6.15 |
| Total | 34843 | 100.00 |

| Overall EcNo | # Samples | % PDF |
|---------------|--------------|---------------|
| (Max, <=-6) | 8540 | 37.83 |
| (-6, <=-9) | 9075 | 40.20 |
| (-9, <=-11) | 3299 | 14.62 |
| (-11, <=-14) | 1158 | 5.13 |
| (-14, <= Min) | 500 | 2.22 |
| Total | 22572 | 100.00 |

| Overall SINR | # Samples | % PDF |
|--------------|--------------|---------------|
| (MIN, <=0) | 4229 | 11.74 |
| (0, <=5) | 6126 | 17.01 |
| (5, <=10) | 8076 | 22.42 |
| (10, <=15) | 8495 | 23.59 |
| (15, <= Min) | 9088 | 25.23 |
| Total | 36014 | 100.00 |

III. Technology Details

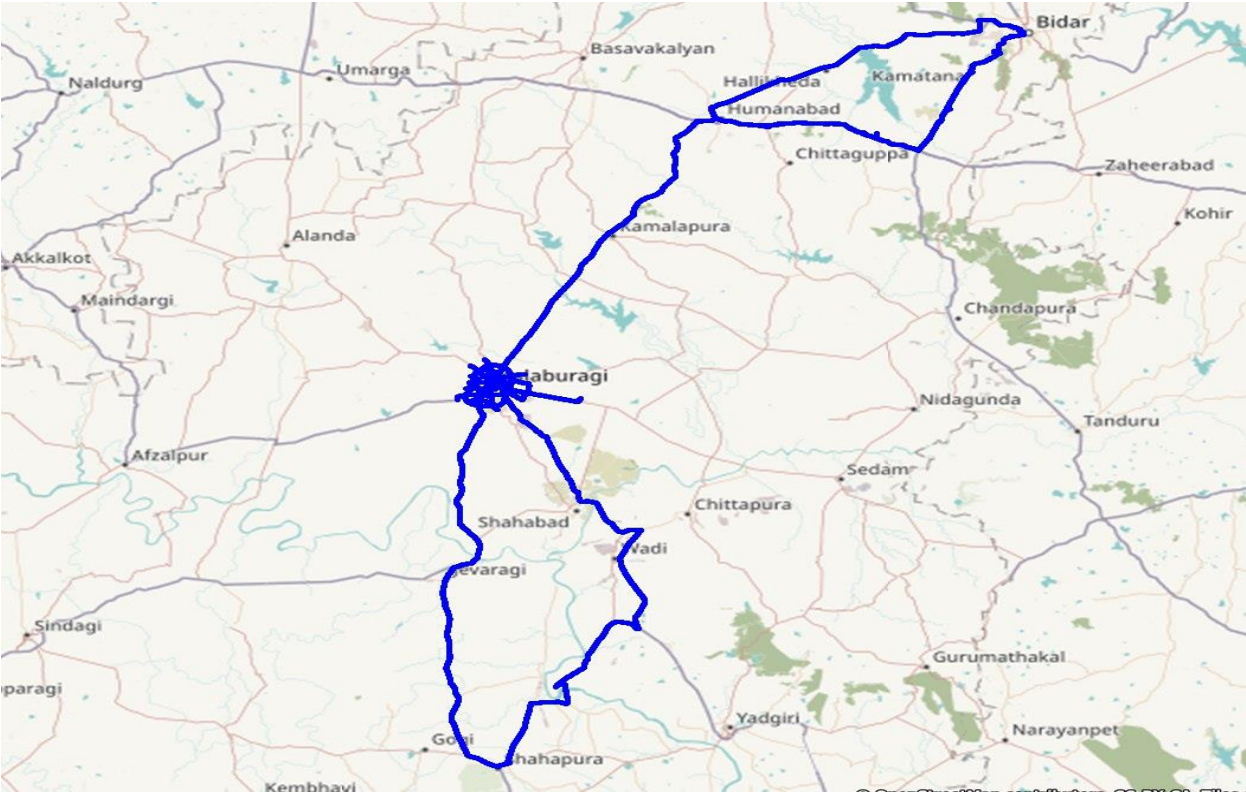
| TSP | Time Spent on 3G/4G % |
|-----------|-----------------------|
| BSNL 3G | 7.2 |
| VIL 3G | 98.71 |
| Airtel 4G | 100 |
| BSNL 4G | 20.7 |
| Jio 4G | 100 |
| VIL 4G | 99.61 |



III. Technology Details

Airtel

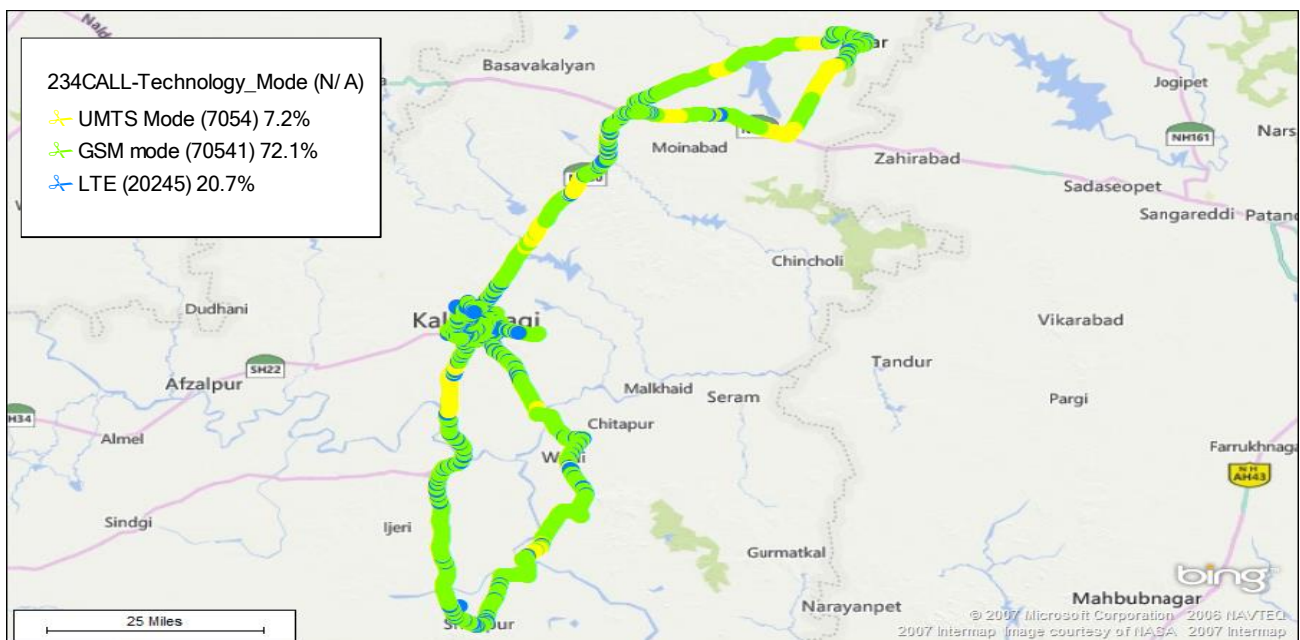
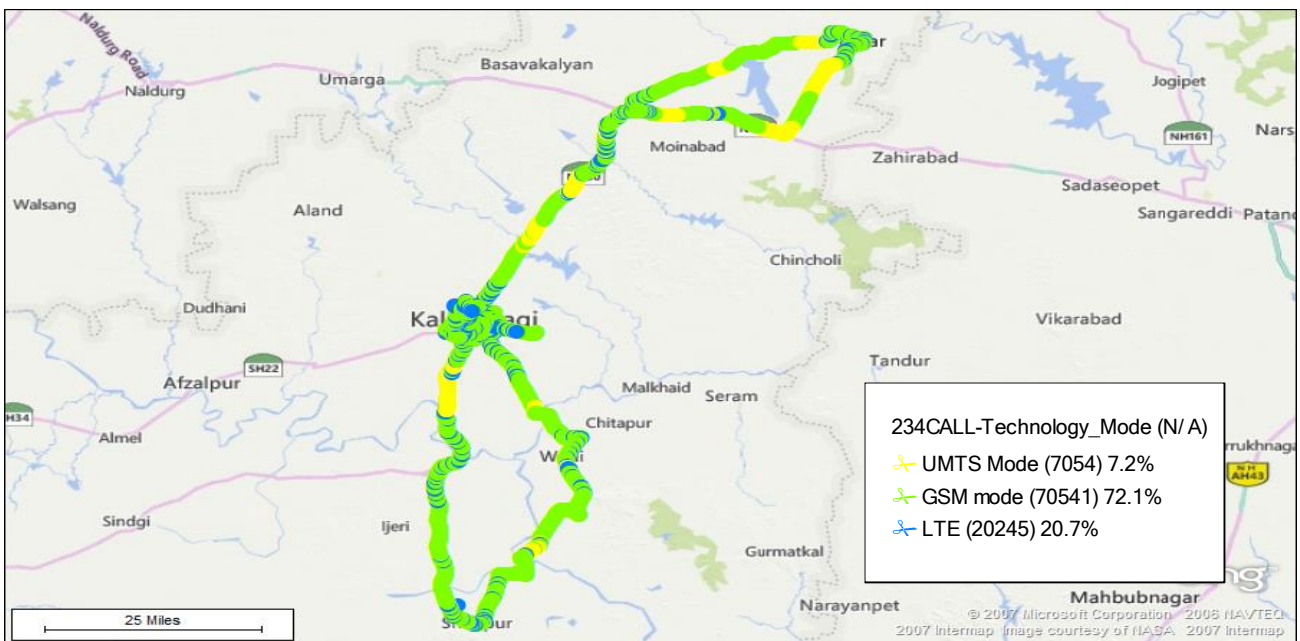
| Technology | Time Spent % |
|------------|--------------|
| 4G | 100 |



III. Technology Details

BSNL

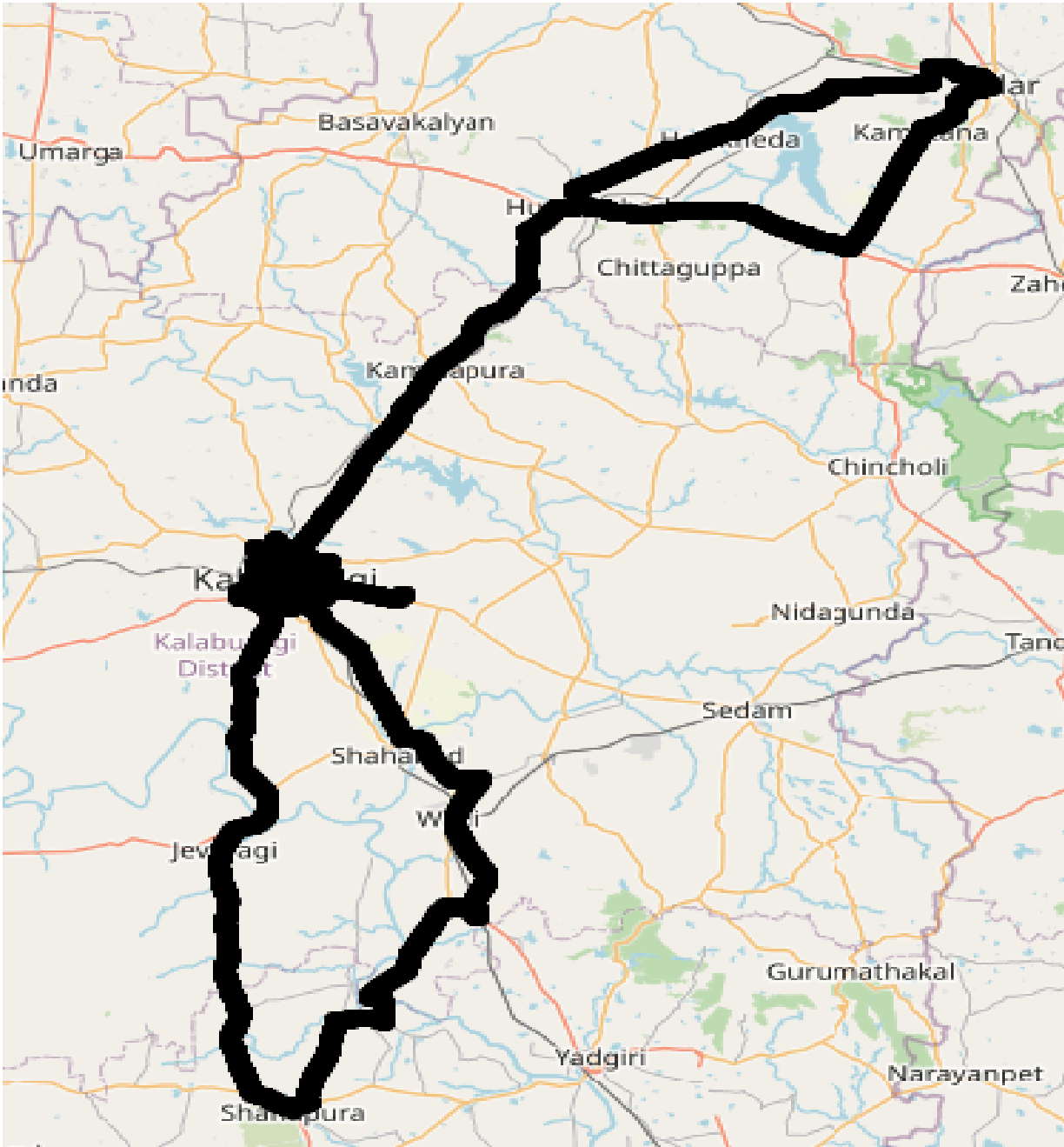
| Technology | Time Spent % |
|------------|--------------|
| 3G | 7.2 |
| 4G | 20.7 |



III. Technology Details

JIO

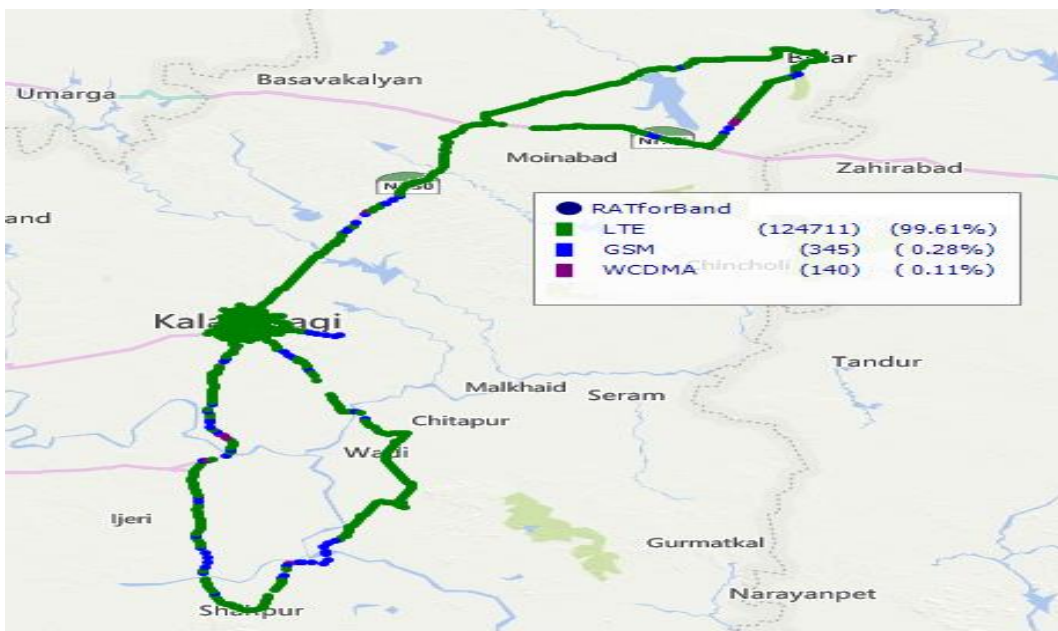
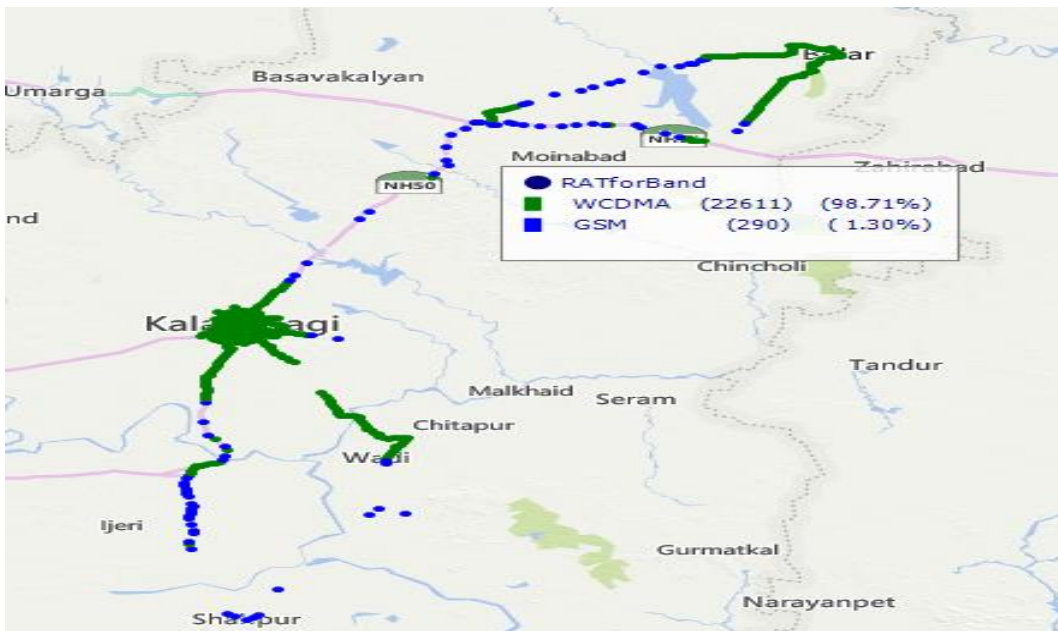
| Technology | Time Spent % |
|------------|--------------|
| 4G | 100 |



III. Technology Details

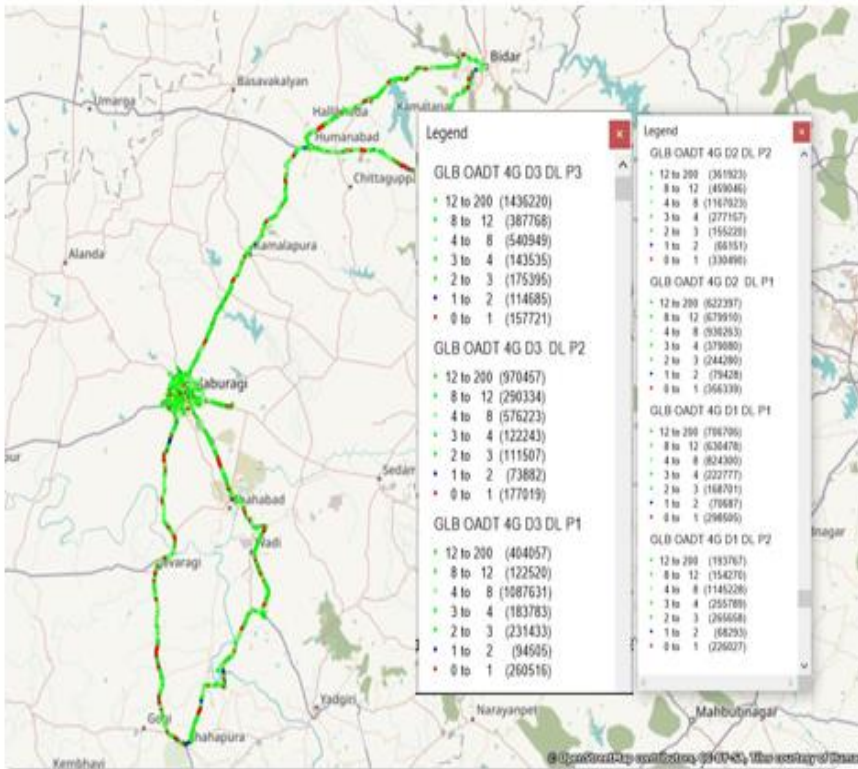
VIL

| Technology | Time Spent |
|------------|------------|
| 3G | 98.71 |
| 4G | 99.61 |

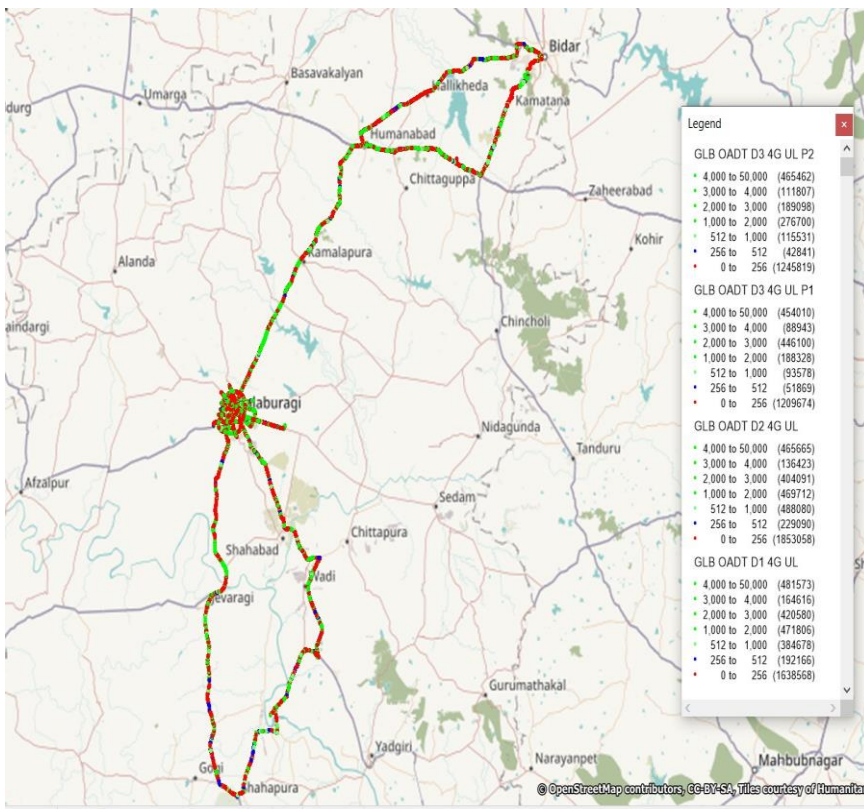


IV. Dynamic Data Test (Data Test on Move) - 4G DL/UL Details

Airtel



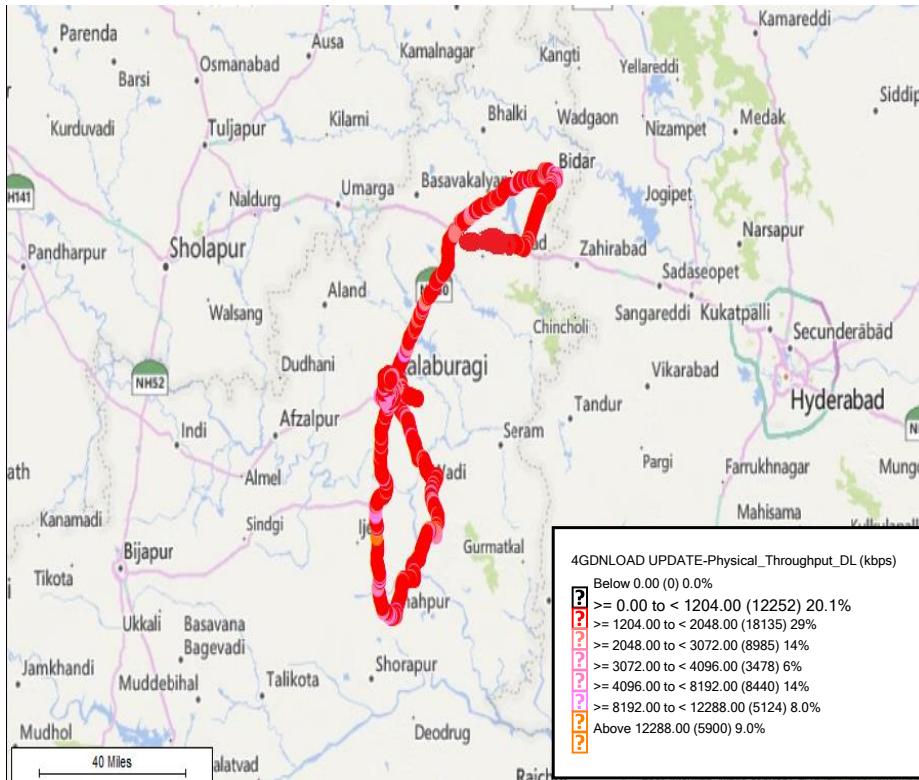
| DL throughput | No. of Samples | % |
|---------------|----------------|-------|
| 0 to 1 Mbps | 1806617 | 9.51 |
| 1 to 2 Mbps | 567631 | 2.99 |
| 2 to 3 Mbps | 1352194 | 7.12 |
| 3 to 4 Mbps | 1584364 | 8.34 |
| 4 to 8 Mbps | 6271617 | 33 |
| 8 to 12 Mbps | 2724326 | 14.34 |
| >12 Mbps | 4695527 | 24.71 |
| Total | 19002276 | 100 |



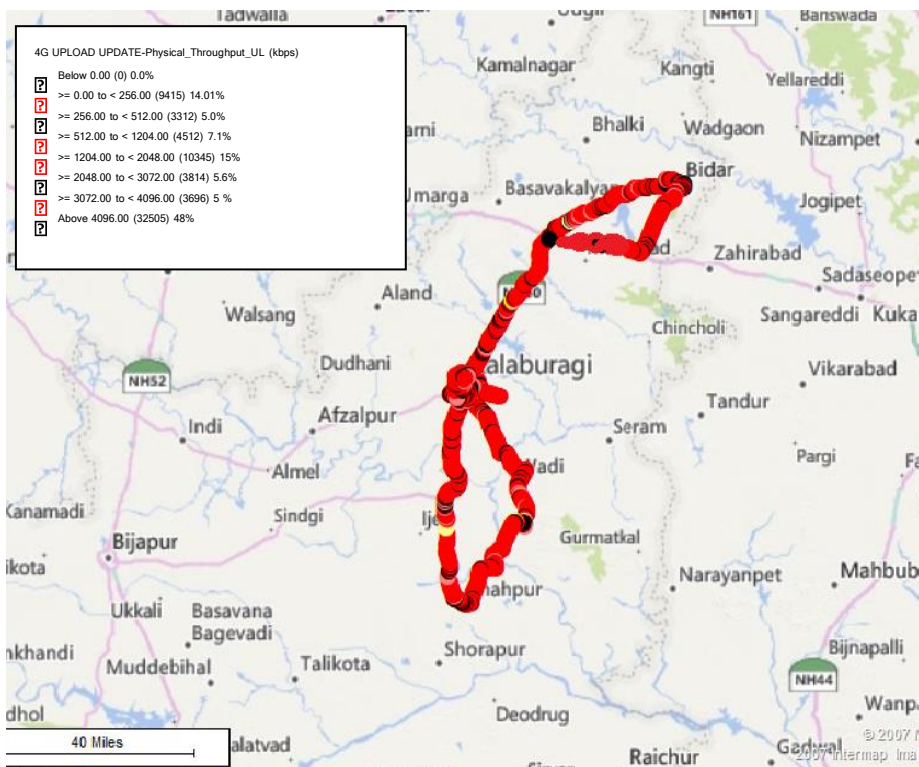
| UL throughput | No. of samples | % |
|--------------------|----------------|-------|
| 0 to 256 Kbps | 5083330 | 46.54 |
| 250 to 512 Kbps | 1003487 | 4.04 |
| 512 Kbps to 1 Mbps | 733302 | 8.47 |
| 1 to 2 Mbps | 1030087 | 11.01 |
| 2 to 3 Mbps | 622525 | 11.42 |
| 3 to 4 Mbps | 505588 | 3.93 |
| >4 Mbps | 4020263 | 14.61 |
| Total | 17333508 | 100 |

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

BSNL



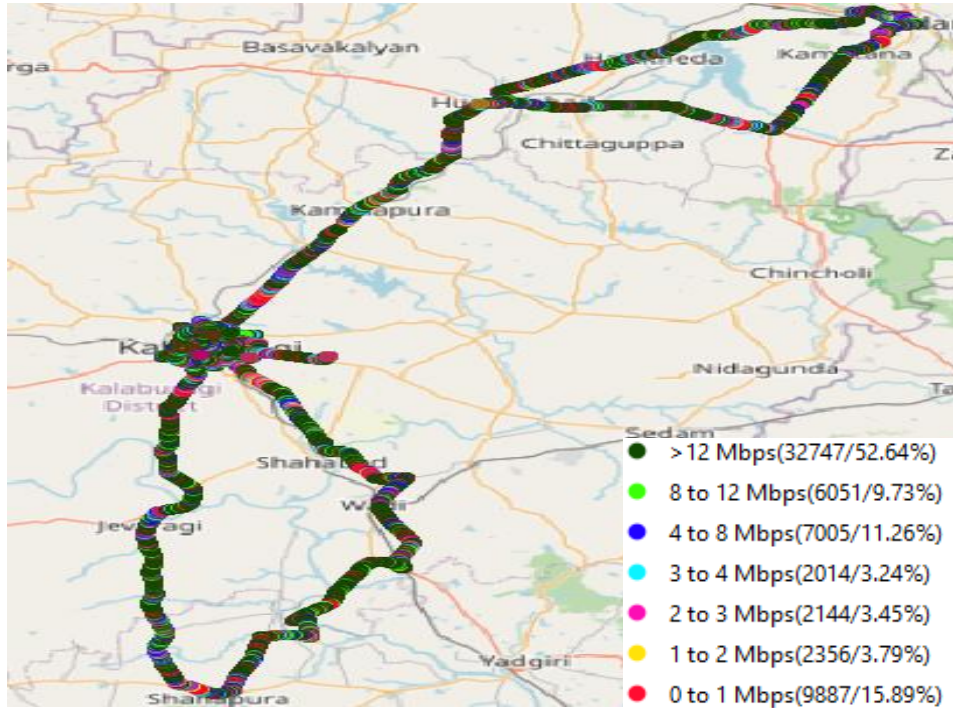
| DL throughput | No. of Samples | % |
|---------------|----------------|-----|
| 0 to 1 Mbps | 12252 | 20 |
| 1 to 2 Mbps | 18135 | 29 |
| 2 to 3 Mbps | 8985 | 14 |
| 3 to 4 Mbps | 3478 | 6 |
| 4 to 8 Mbps | 8440 | 14 |
| 8 to 12 Mbps | 5124 | 8 |
| >12 Mbps | 5900 | 9 |
| Total | 62314 | 100 |



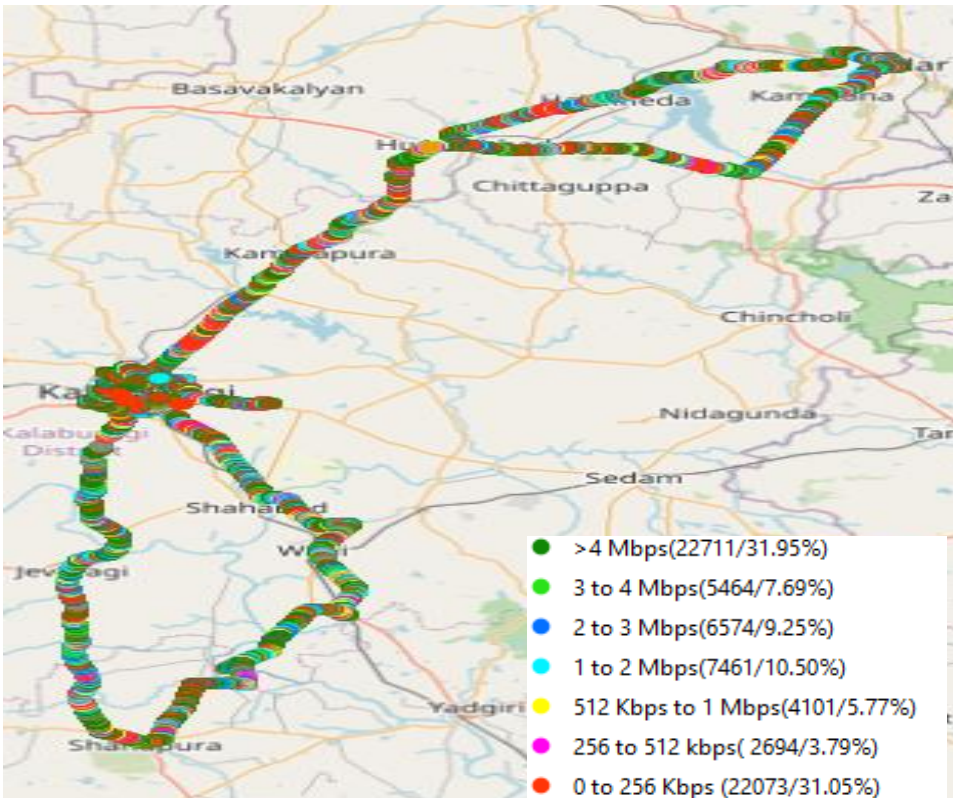
| UL throughput | No. of Samples | % |
|---------------|----------------|-----|
| 0 to 1 Mbps | 9415 | 14 |
| 1 to 2 Mbps | 3312 | 5 |
| 2 to 3 Mbps | 4512 | 7 |
| 3 to 4 Mbps | 10345 | 15 |
| 4 to 8 Mbps | 3814 | 5.6 |
| 8 to 12 Mbps | 3696 | 5 |
| >12 Mbps | 32505 | 48 |
| Total | 67599 | 100 |

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

JIO



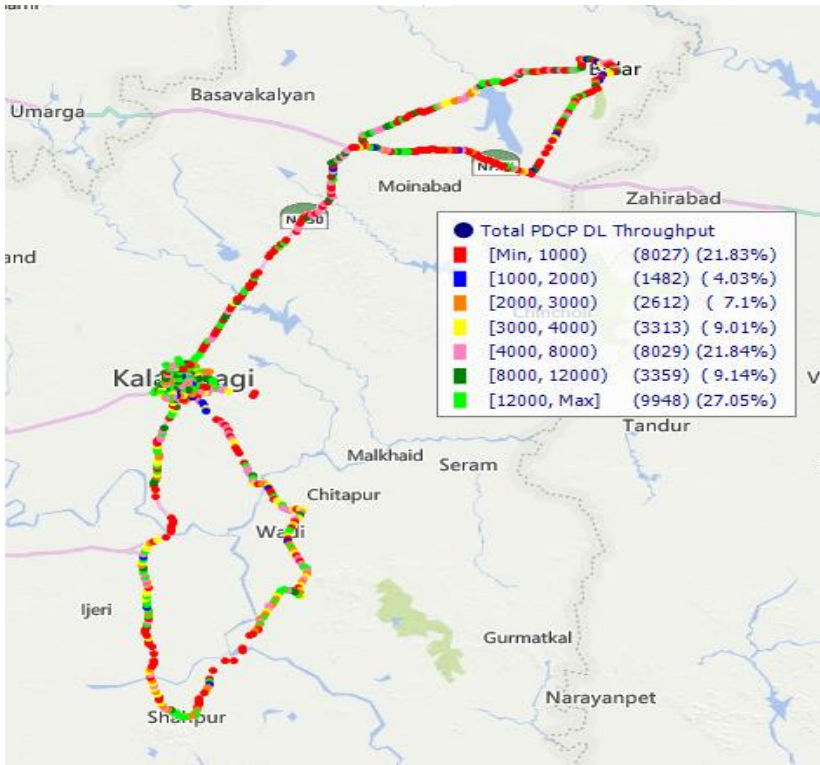
| DL throughput | No. of Samples | % |
|---------------|----------------|------------|
| 0 to 1 Mbps | 9887 | 15.89 |
| 1 to 2 Mbps | 2356 | 3.79 |
| 2 to 3 Mbps | 2144 | 3.45 |
| 3 to 4 Mbps | 2014 | 3.24 |
| 4 to 8 Mbps | 7005 | 11.26 |
| 8 to 12 Mbps | 6051 | 9.73 |
| >12 Mbps | 32747 | 52.64 |
| Total | 62204 | 100 |



| UL throughput | No. of samples | % |
|--------------------|----------------|------------|
| 0 to 256 kbps Mbps | 22073 | 31.05 |
| 256 to 512 kbps | 2694 | 3.79 |
| 512 Kbps to 1 Mbps | 4101 | 5.77 |
| 1 to 2 Mbps | 7461 | 10.50 |
| 2 to 3 Mbps | 6574 | 9.25 |
| 3 to 4 Mbps | 5464 | 7.69 |
| >4Mbps | 22711 | 31.95 |
| Total | 71078 | 100 |

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

VIL



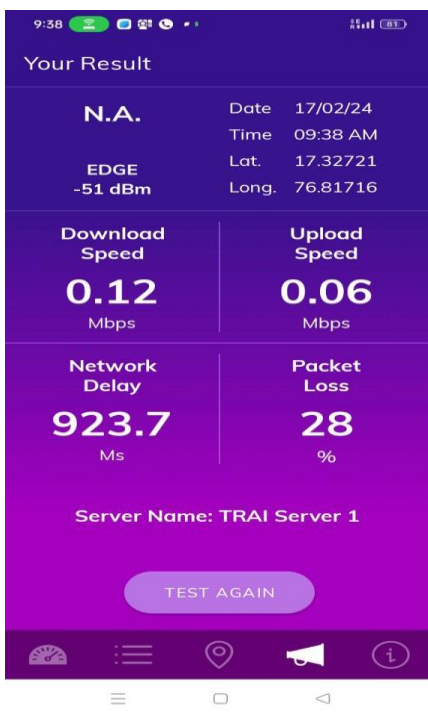
| DL throughput | No. of Samples | % |
|---------------|----------------|------------|
| 0 to 1 Mbps | 8027 | 21.83 |
| 1 to 2 Mbps | 1482 | 4.03 |
| 2 to 3 Mbps | 2612 | 7.10 |
| 3 to 4 Mbps | 3313 | 9.01 |
| 4 to 8 Mbps | 8029 | 21.84 |
| 8 to 12 Mbps | 3359 | 9.14 |
| >12 Mbps | 9948 | 27.05 |
| Total | 36770 | 100 |

| UL throughput | No. of samples | % |
|--------------------|----------------|---|
| 0 to 256 Kbps | | |
| 250 to 512 Kbps | | |
| 512 Kbps to 1 Mbps | | |
| 1 to 2 Mbps | | |
| 2 to 3 Mbps | | |
| 3 to 4 Mbps | | |
| >4Mbps | | |
| Total | | |

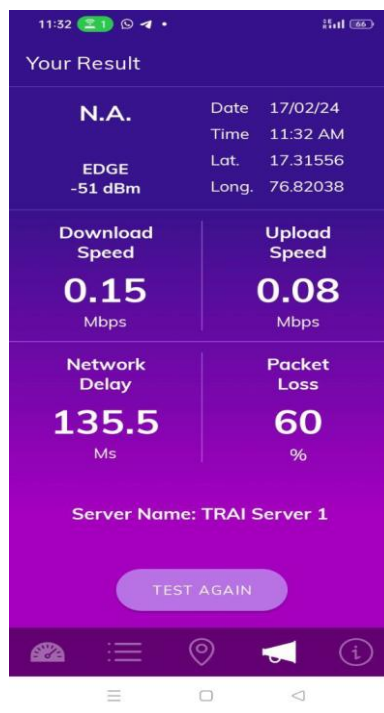
V. TRAI My Speed App Test Details-2G

| Techology-2G | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|---------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | 0.12 | 0.15 | 0.13 | 0.08 | 0.10 | 0.07 |
| Upload Speed (Mbps) | 0.06 | 0.08 | 0.04 | 0.01 | 0.05 | 0.05 |
| Latency | 923.7 | 135.7 | 108.6 | 0 | 130.8 | 110.5 |

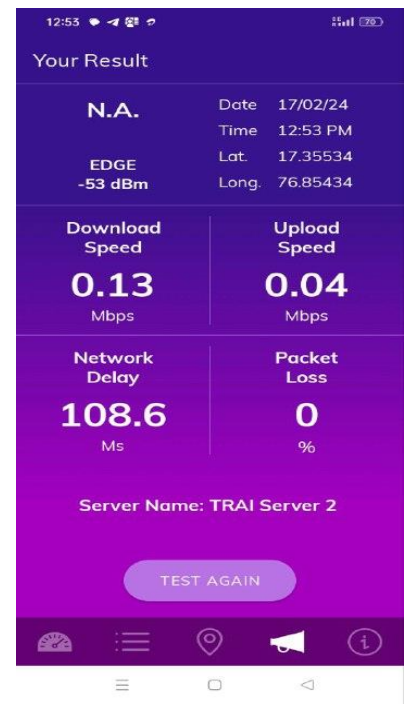
Airport



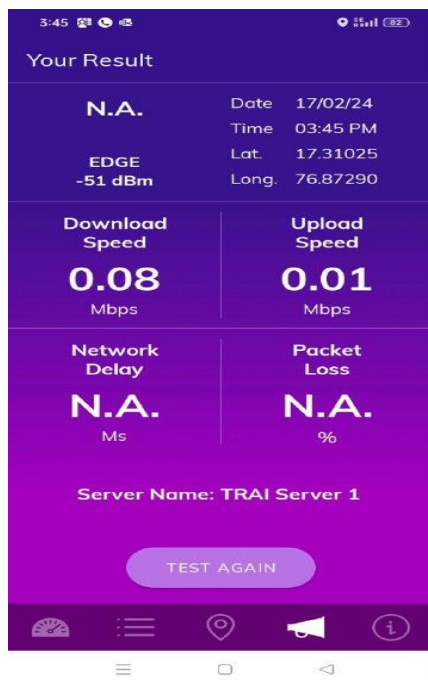
Gulbarga University



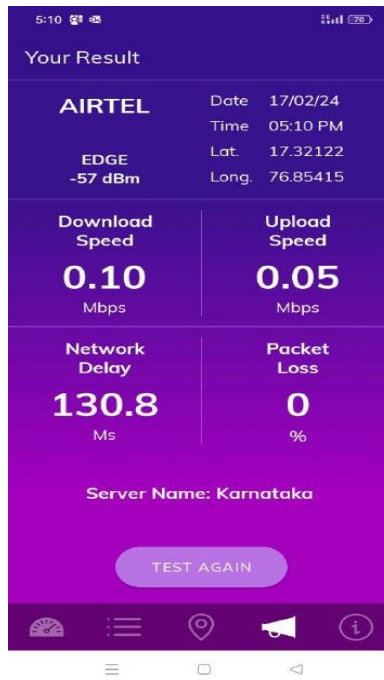
KCT College of Pharmacy



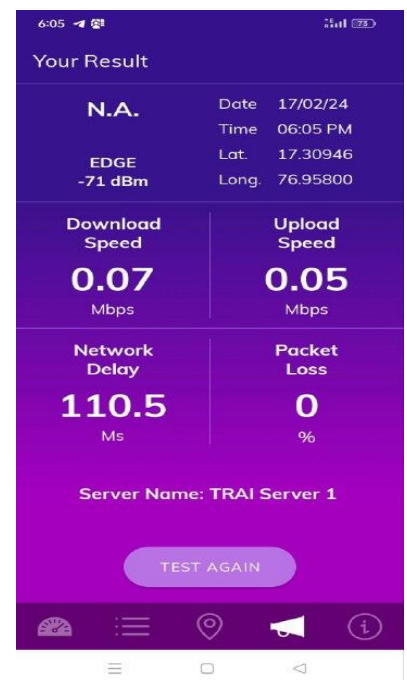
RTO Office



Railway Station

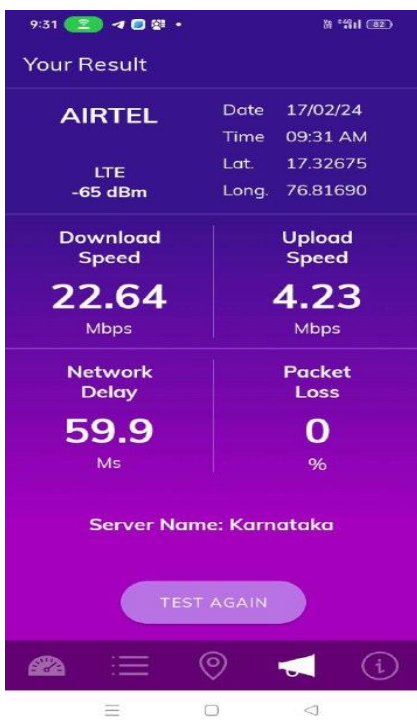


Central Busstand

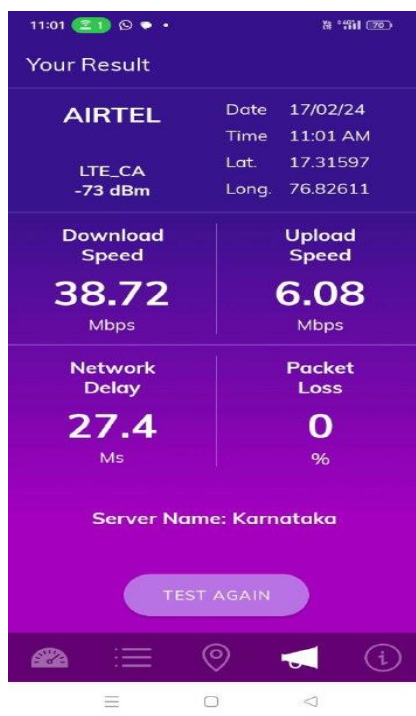


| Techology-4G/VoLTE | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|---------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | 22.64 | 38.72 | 26.56 | 11.78 | 26.45 | 16.47 |
| Upload Speed (Mbps) | 4.23 | 6.08 | 12.12 | 4.58 | 23.52 | 13.22 |
| Latency | 59.9 | 27.4 | 27.7 | 42.4 | 47.5 | 47.7 |

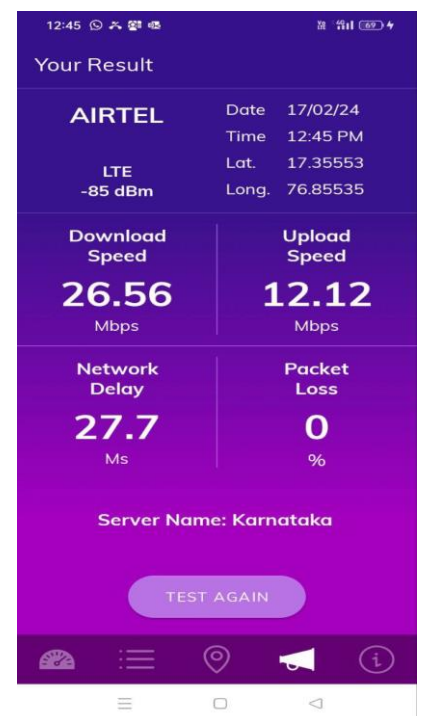
Airport



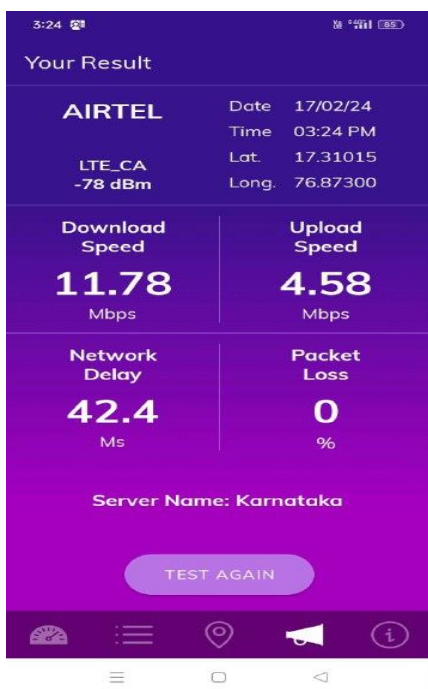
Gulbarga University



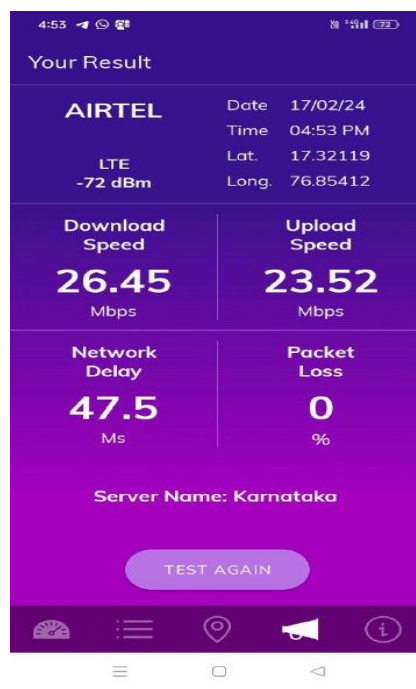
KCT College of Pharmacy



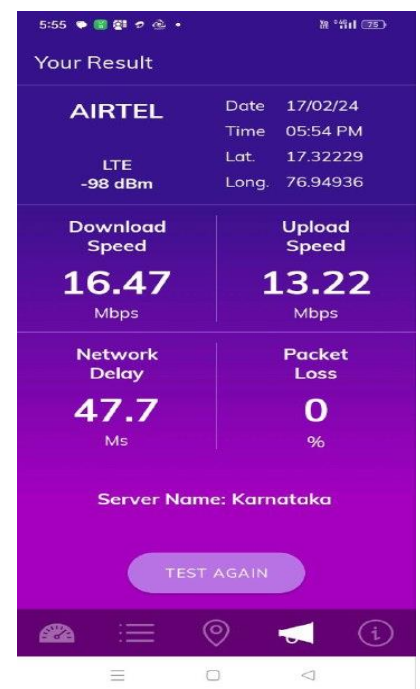
RTO Office



Railway Station



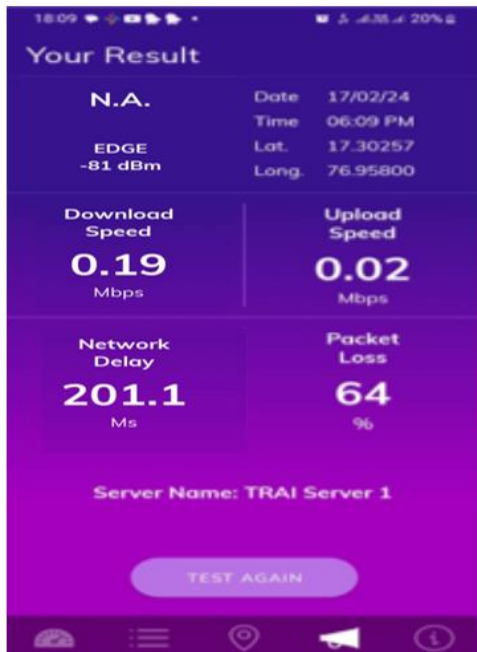
Central Busstand



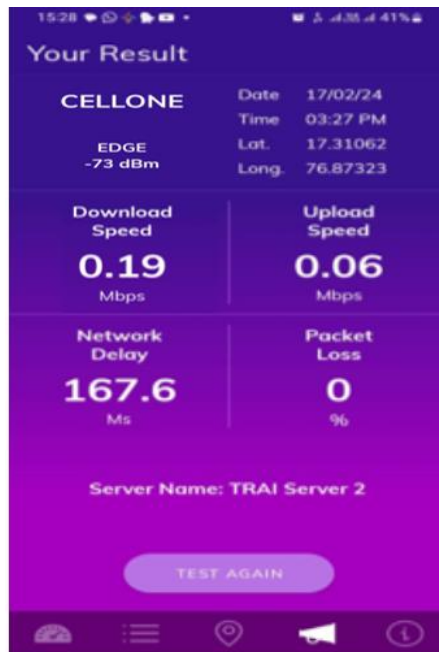
V. TRAI MySpeed App Test Details-2G

| Techology-4G/VoLTE | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|---------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | 0.19 | 0.19 | 0.22 | 0.22 | 0.14 | 0.15 |
| Upload Speed (Mbps) | 0.02 | 0.06 | 0.08 | 0.02 | 0.03 | 0.05 |
| Latency(ms) | 201.1 | 167.6 | 151.5 | 167.6 | 157 | 204.9 |

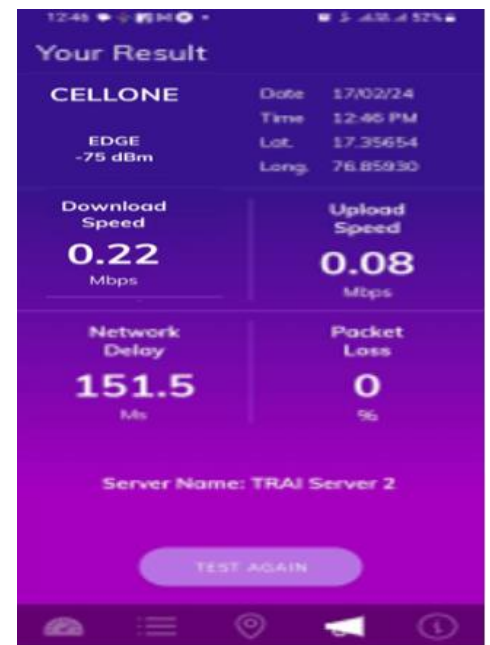
Airport



Gulbarga University



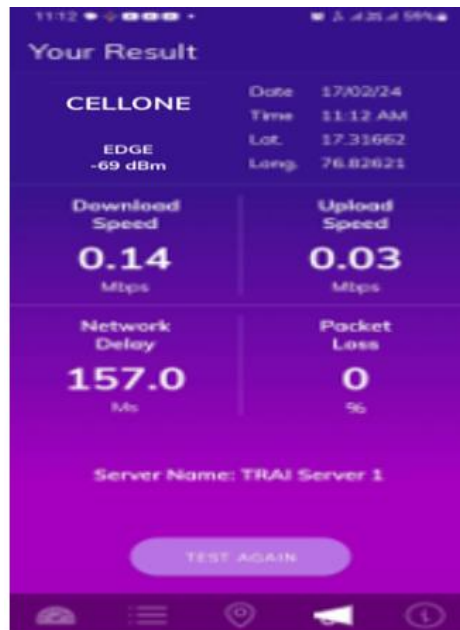
KCT College of Pharmacy



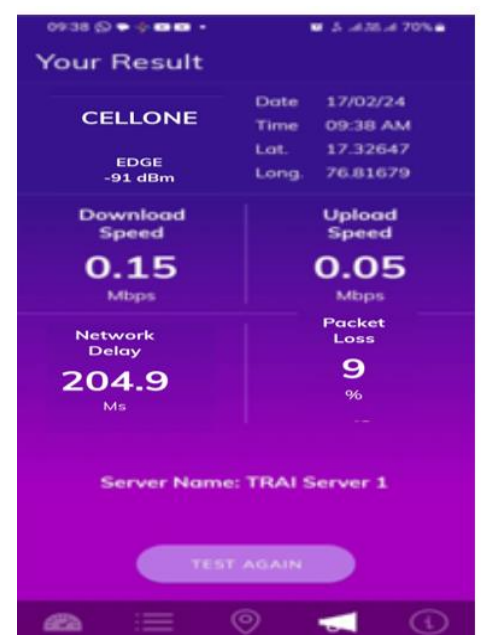
RTO Office



Railway Station



Central Busstand



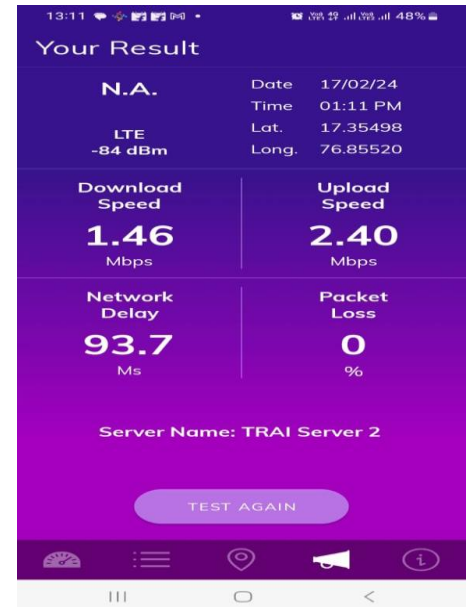
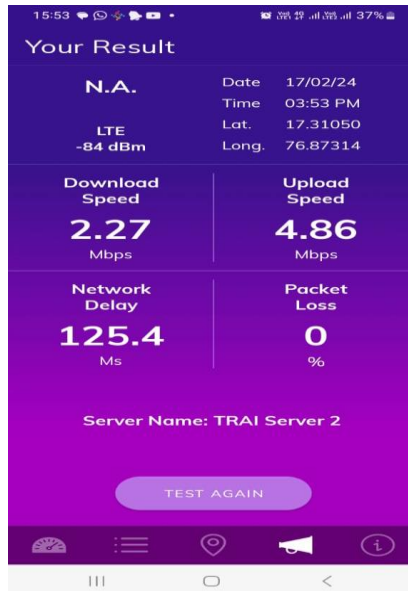
V. TRAI MySpeed App Test Details-4G

| Techology-4G | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|------------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | NO 4G SITE | 2.27 | 1.46 | 6.23 | 9.65 | 10.24 |
| Upload Speed (Mbps) | NO 4G SITE | 4.86 | 2.40 | 4.35 | 5.35 | 5.15 |
| Latency | NO 4G SITE | 63.6 | 93.7 | 73.1 | 80 | 108.3 |

Airport

Gulbarga University

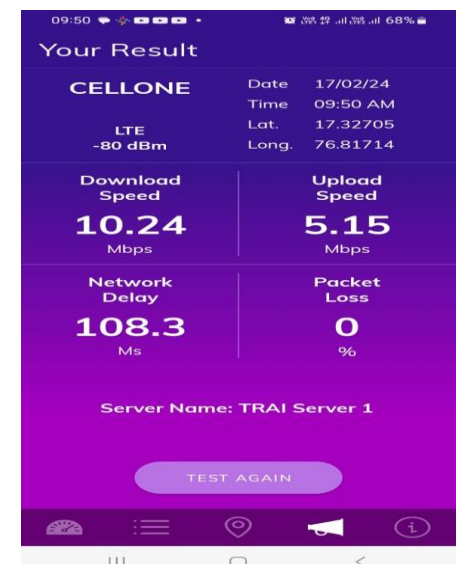
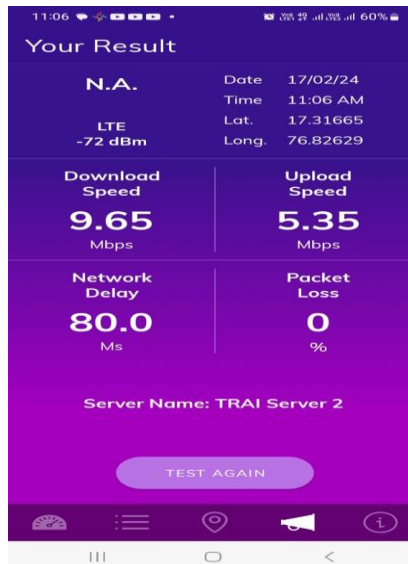
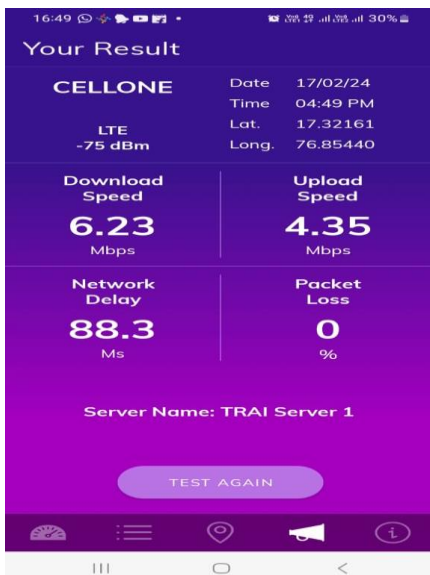
KCT College of Pharmacy



RTO Office

Railway Station

Central Busstand



V. TRAI MySpeed App Test Details-4G

| Technology-4G | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|---------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | 22.54 | 25.27 | 9.22 | 46.47 | 23.78 | 20.67 |
| Upload Speed (Mbps) | 5.20 | 4.74 | 3.32 | 9.18 | 5.64 | 7.04 |
| Latency | 64.7 | 81.3 | 63.4 | 54.9 | 52.4 | 54.5 |

Airport

JIO Date 17/02/24
Time 06:20 PM
LTE -98 dBm Lat. 17.31013
Long. 76.95354

| | |
|--|-------------------------------------|
| Download Speed 22.54 Mbps | Upload Speed 5.20 Mbps |
| Network Delay 64.7 Ms | Packet Loss 0 % |

Gulbarga University

JIO Date 17/02/24
Time 03:35 PM
LTE_CA -67 dBm Lat. 17.31020
Long. 76.87298

| | |
|--|-------------------------------------|
| Download Speed 25.27 Mbps | Upload Speed 4.74 Mbps |
| Network Delay 81.3 Ms | Packet Loss 0 % |

KCT College of Pharmacy

JIO Date 17/02/24
Time 12:47 PM
LTE_CA -85 dBm Lat. 17.35549
Long. 76.85544

| | |
|---------------------------------------|-------------------------------------|
| Download Speed 9.22 Mbps | Upload Speed 3.32 Mbps |
| Network Delay 63.4 Ms | Packet Loss 0 % |

RTO Office

JIO Date 17/02/24
Time 04:33 PM
LTE_CA -73 dBm Lat. 17.32140
Long. 76.85435

| | |
|--|-------------------------------------|
| Download Speed 46.47 Mbps | Upload Speed 9.18 Mbps |
| Network Delay 54.9 Ms | Packet Loss 0 % |

Railway Station

JIO Date 17/02/24
Time 11:08 AM
LTE_CA -64 dBm Lat. 17.31518
Long. 76.82572

| | |
|--|-------------------------------------|
| Download Speed 23.78 Mbps | Upload Speed 5.64 Mbps |
| Network Delay 52.4 Ms | Packet Loss 0 % |

Central Busstand

JIO Date 17/02/24
Time 09:29 AM
LTE -73 dBm Lat. 17.32668
Long. 76.81677

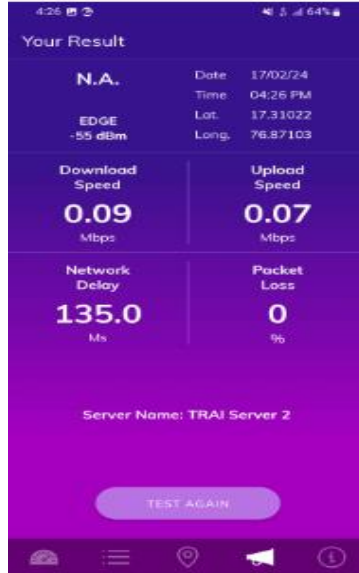
| | |
|--|-------------------------------------|
| Download Speed 20.67 Mbps | Upload Speed 7.04 Mbps |
| Network Delay 54.5 Ms | Packet Loss 0 % |

| Techology-2G | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|---------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | 0.08 | 0.09 | 0.07 | 0.07 | 0.10 | 0.08 |
| Upload Speed (Mbps) | 0.05 | 0.07 | 0.04 | 0.04 | 0.07 | 0.05 |
| Latency | 165.5 | 135.0 | 165.5 | 165.5 | 158.0 | 157.4 |

Airport



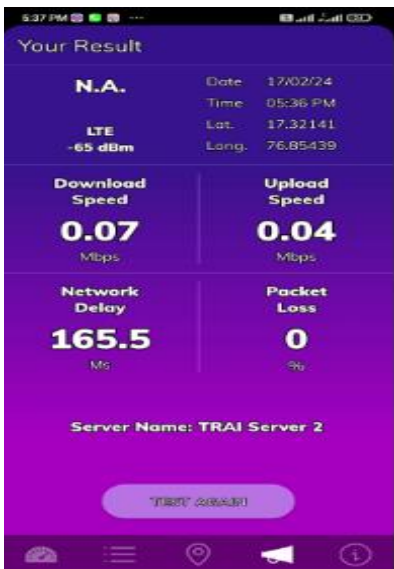
Gulbarga University



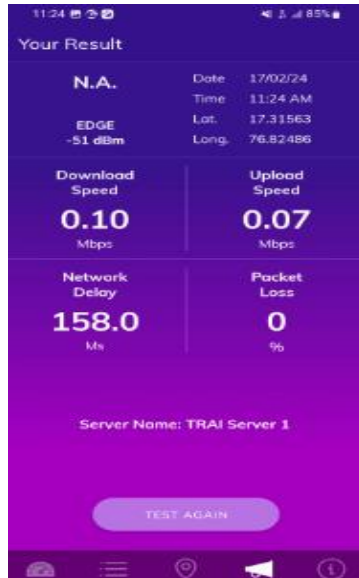
KCT College of Pharmacy



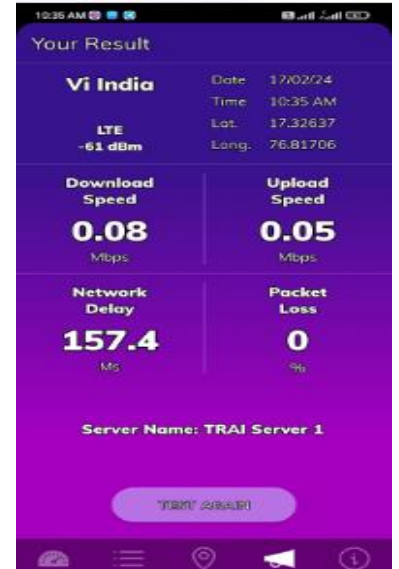
RTO Office



Railway Station

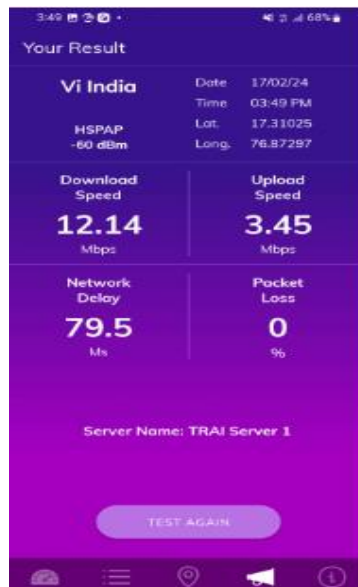


Central Busstand

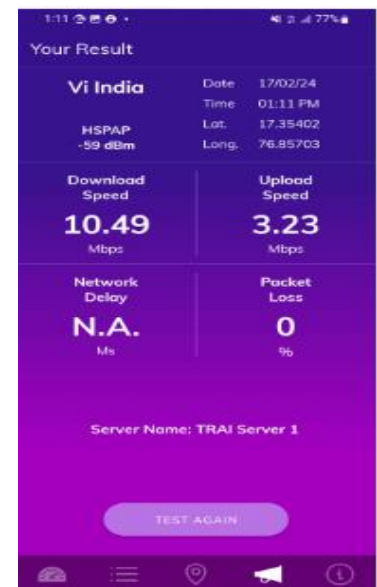


| Techology-4G/VoLTE | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|---------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | NA | 12.14 | 10.49 | 10.81 | 7.50 | 12.70 |
| Upload Speed (Mbps) | NA | 3.45 | 3.23 | 2.09 | 4.39 | 2.21 |
| Latency | NA | 79.5 | NA | 63.2 | 50.6 | 64.8 |

Airport



Gulbarga University

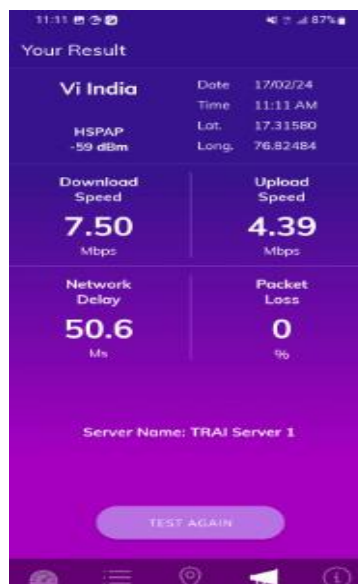


KCT College of Pharmacy

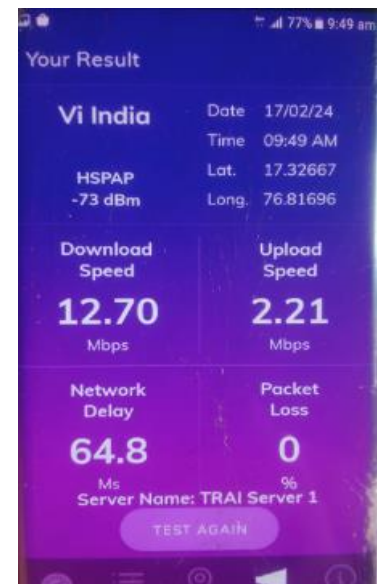
RTO Office



Railway Station



Central Busstand



| Techology-4G/VoLTE | Airport | Gulbarga University | KCT College of Pharmacy | RTO Office | Railway Station | Central Busstand |
|-----------------------|---------|---------------------|-------------------------|------------|-----------------|------------------|
| Download Speed (Mbps) | NA | 20.25 | 26.34 | 14.39 | 13.37 | 24.21 |
| Upload Speed (Mbps) | NA | 13.47 | 14.86 | 13.53 | 17.06 | 18.74 |
| Latency | NA | 36.4 | 47.1 | 51.5 | 36.4 | 47.2 |

Airport

Gulbarga University

KCT College of Pharmacy



RTO Office

Railway Station

Central Busstand

