

Operator Assisted Drive Test Report

Vellore SSA

AUGUST 2023

(RO, HYDERABAD)

Key Performance Indicators: All TSPs have met the Drop Call Rate (DCR) benchmark of 2%. All TSPs have met the Call Setup Success Rate (CSSR) of 95%. All TSPs have met the Rx Quality of 95% except Airtel VoLTE & Jio VoLTE.

The Operator Assisted Drive Test has been carried out by Regional Office, Hyderabad with the help of Service Providers in Vellore, Ranipet, Tirupattur and Tiruvannamalai Districts from 9:00 AM to 8:00 PM during 22nd August to 25th August 2023. The drive test covered drive route of 450 KMs & 6 hotspots over a period of 4 days. Approximately 654 calls were made for each of the 8 networks: three 2G networks, two 3G networks and three LTE network covering four TSPs.

Overview

Regional Office, TRAI Hyderabad conducted Operator Assisted Drive Test from 22nd to 25th August 2023 covering various locations in Vellore, Ranipet, Tirupattur and Tiruvannamalai Districts. The performance of Airtel, BSNL, Vodafone Idea and Jio were monitored across various technologies (2G, 3G and 4G). The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services in terms of

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

Data: Download and Upload Throughputs, Video Streaming Interruption delay, Web Browsing Delay and Latency.

Drive Test Details :

Voice Tests: Calls were made for 90 sec duration with wait time of 10 sec between calls in all technologies. The drive test covered a drive route of approximately 450 KMs over a period of 4 days from 22nd to 25th Aug 2023. Approximately 654 calls were made for each of the 8 networks: three 2G (Lock Mode) networks, two 3G (Dual mode) network and three VoLTE network covering 4 unique TSPs.

Data Tests:

1. Dynamic data test was conducted for 450 kms over a period of 3 days for download throughput for 3G & 4G technologies.

2. Data Tests were performed at 6 static locations for 2G, 3G & 4G technologies.

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

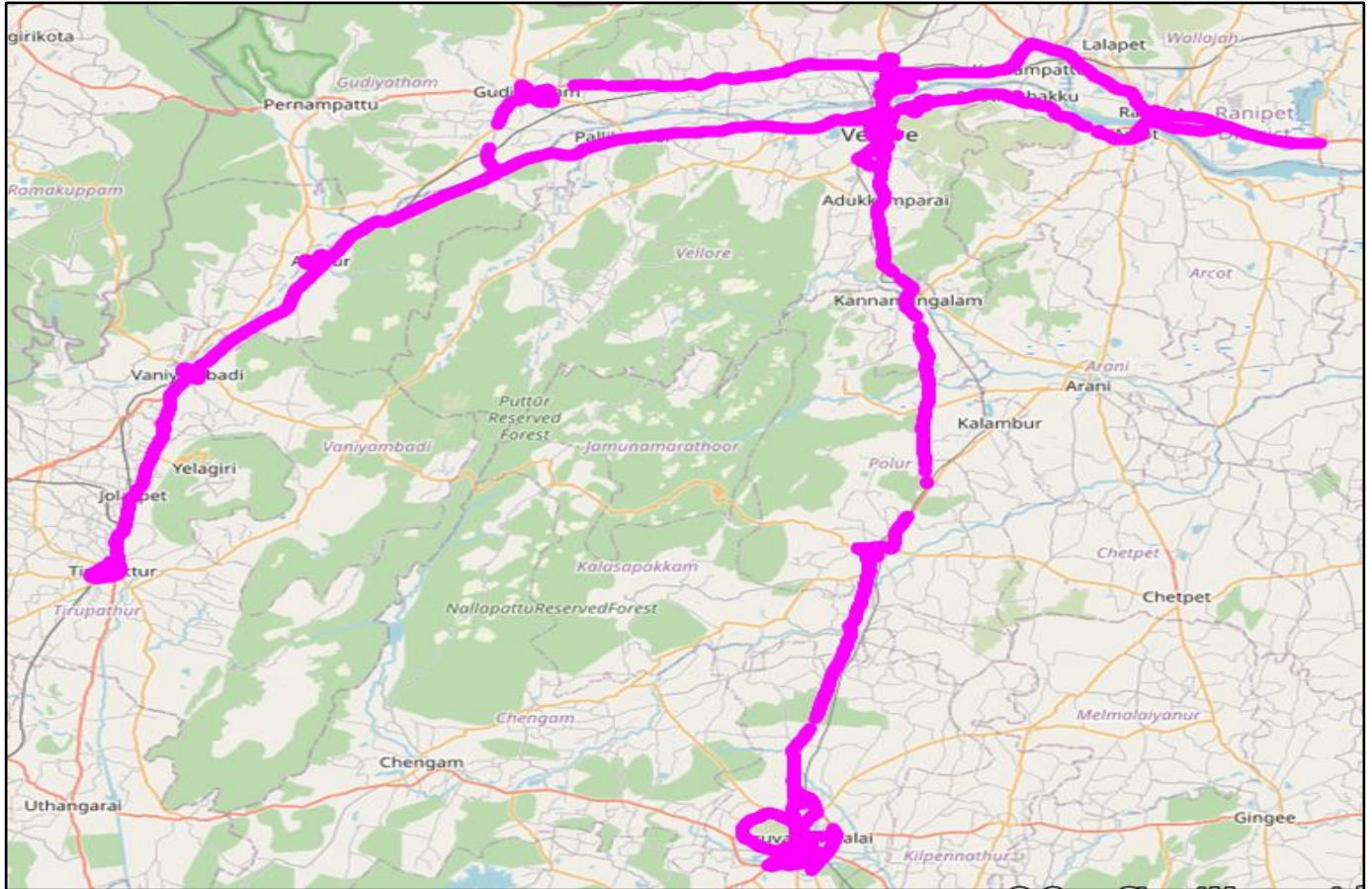
* 3G KPI's which are calculated from UE in Dual Mode (2G & 3G) includes samples and events of 2G.

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

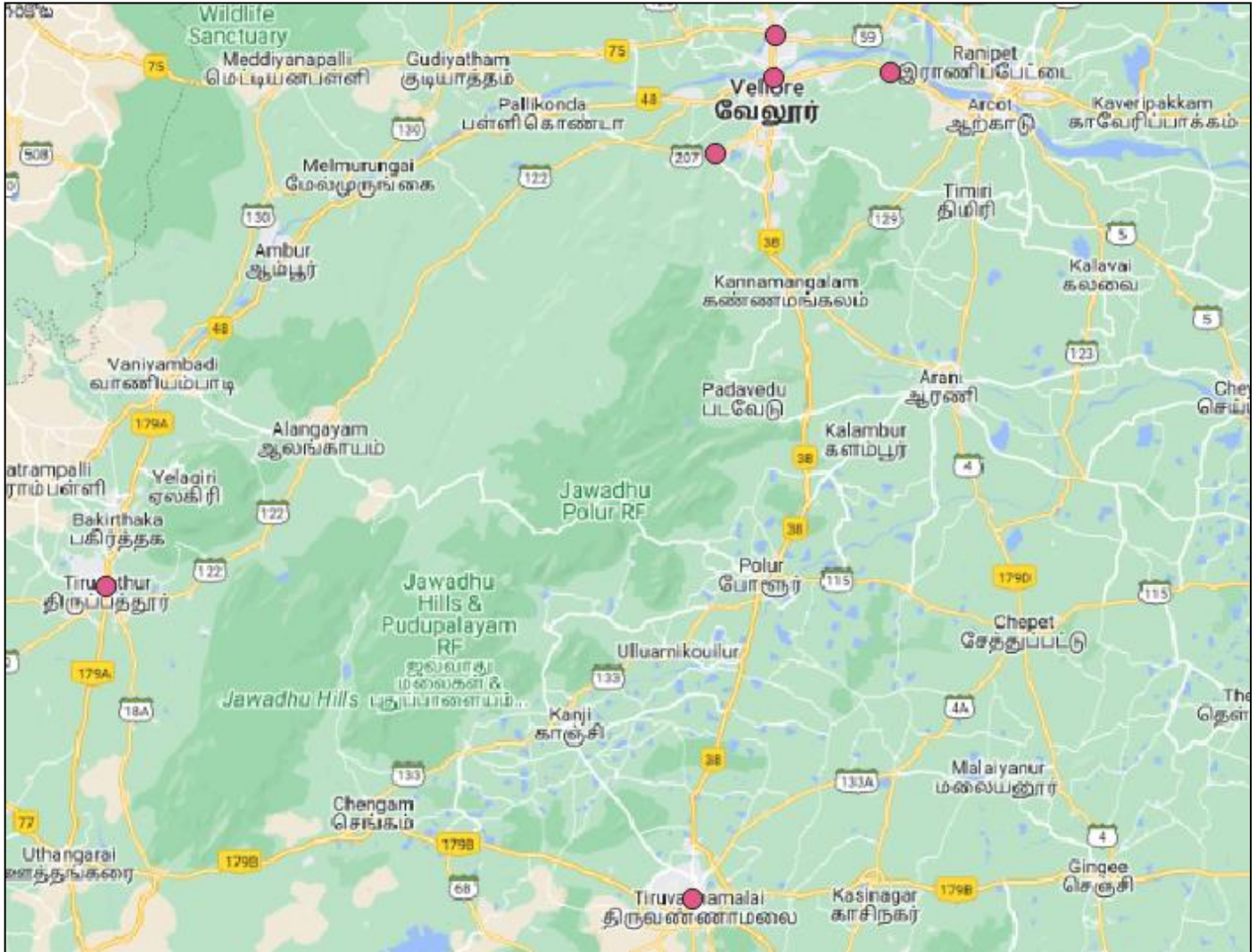
| Service | Specifications |
|--------------|---|
| Download | 2G (Locked) - 500KB, 3G (Dual) - 20 MB, 4G (Free) - 40 MB |
| Upload | 2G (Locked) - 100KB, 3G (Dual) - 5 MB, 4G (Free) - 10 MB |
| Web Browsing | 3 links of e/m commerce website www.amazon.in, www.flipkart.com and www.myntra.com. |
| Latency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

Overview

Voice & Dynamic Data Test Drive Route



| Areas Covered – Vellore & Ranipet Town (Day 1) | | Areas Covered-Tirupattur (Day 2) | Areas Covered-Tiruvannamalai (Day 3) |
|--|-------------------|----------------------------------|--------------------------------------|
| Vellore Town | Sathuvacheri | Old Katpadi | Vellore Town |
| Saidapet | Collector Office | Gudiyatham Road | Adukamparai |
| CMC Hospital | Alamelumangapuram | Latteri | Kaniyampadi |
| Salavanpet | Arapakkam | KV Kuppam | Kannmangalam |
| Velapadi | Pootuthakku | Gudiyatham | Polur Town |
| Otteri | Melvisharam | Mathanur | Kalasapakkam |
| Kosapet | Arcot | Ambur Town | Tiruvannamalai Collectrate |
| Allapuram | Ranipet | Vaniyambadi Town | Vengikal |
| Ariyur | Muthukadai | Jolarpet | TVM Girivalam Road |
| Pennathur | Narasingapuram | Tirupattur Town | New Bustsand |
| VIT | BHEL Ranipet | Pallikondan | Maruthi Nagar |
| Bagayam | Wallajah | Virinchipuram | Ramanashramam |
| Konavattam | Kaveripakkam | Konavattam Highway | Kilnathur |



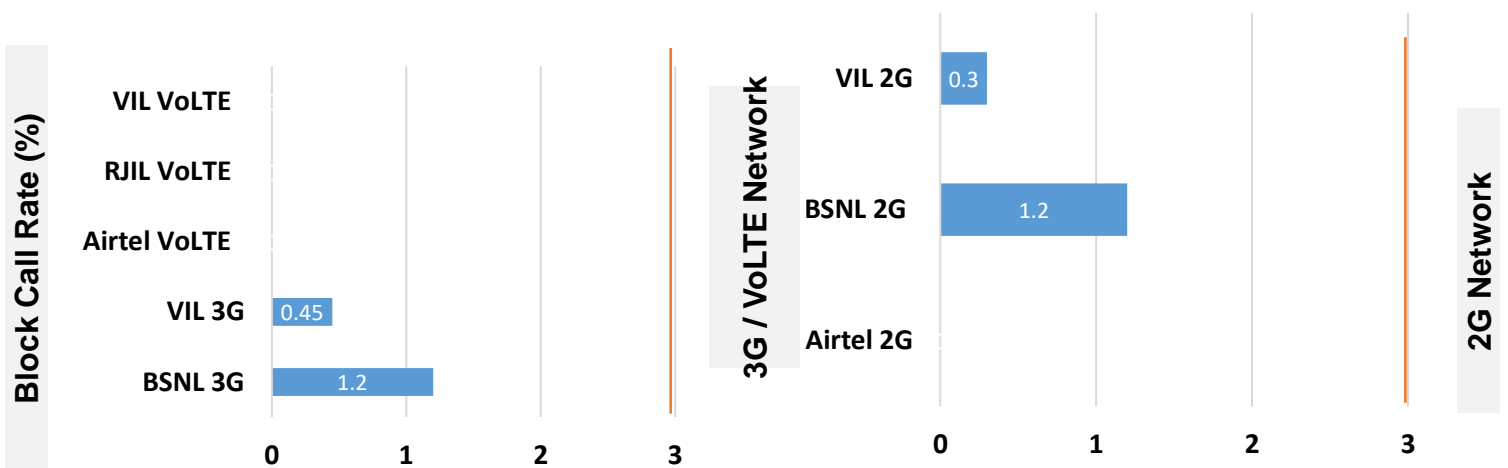
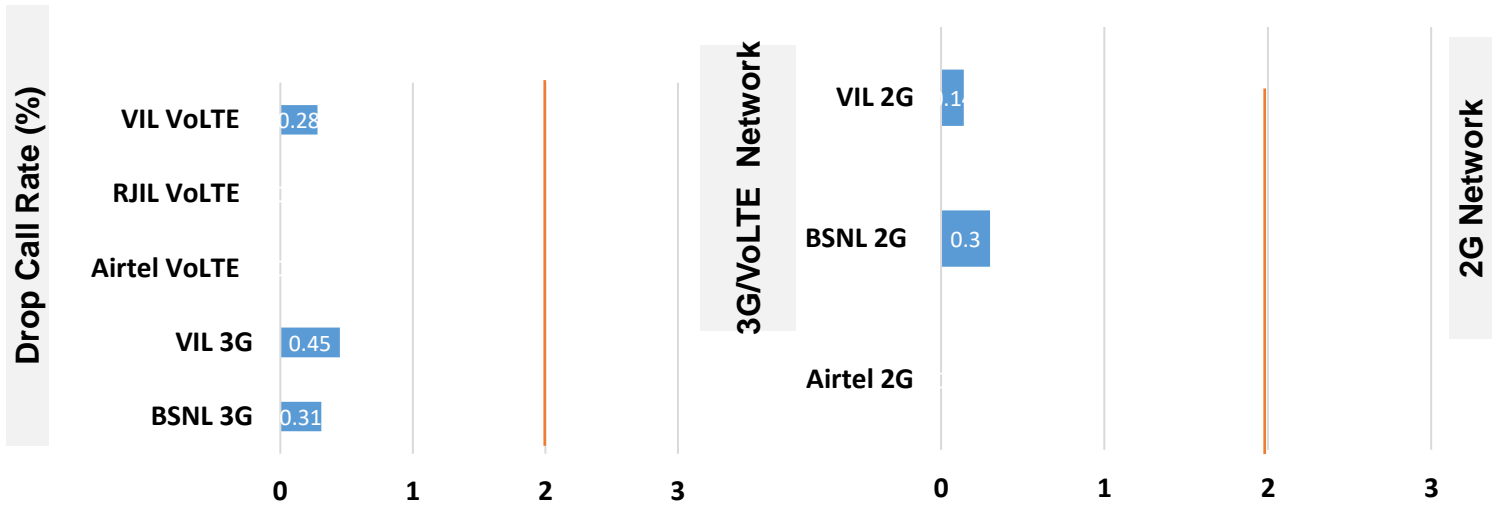
Data Service Test- Static Locations

| Static Location |
|------------------------------|
| CMC Hospital-Ranipet |
| Thirupathur Collector Office |
| Thiruvannamalai Temple |
| Golden Temple- Vellore |
| Railway Station-Katpadi |
| New Bus Stand- Vellore |

Voice Calls

Key Observations

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



| KPIs | 2G | | | 3G | | VoLTE | | |
|-------------------|--------|------|------|------|------|--------|------|------|
| | Airtel | BSNL | VIL | BSNL | VIL | Airtel | RJIL | VIL |
| Drop Call Rate % | 0 | 0.3 | 0.14 | 0.31 | 0.45 | 0 | 0 | 0.28 |
| Block Call Rate % | 0 | 1.2 | 0.30 | 1.2 | 0.45 | 0 | 0 | 0.00 |

- a) All TSPs have met the 2% QOS benchmark of Drop Call Rate (DCR%).
- b) Block Call Rate (CBR%) benchmark of 3% was achieved by all TSP's.

Voice Calls

Key Observations

Coverage

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

| TSPS | 2G | | |
|------------|--------|-------|-------|
| | Airtel | BSNL | VIL |
| Coverage % | 91.13 | 93.38 | 96.27 |

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

| TSPs | 3G/ VoLTE | 3G | VoLTE | | |
|------------|-----------|------|--------|-------|------|
| | BSNL | VIL | Airtel | JIO | VIL |
| Coverage % | 91.95 | 84.4 | 99.80 | 98.83 | 98.9 |

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

| TSPs | 3G/VoLTE | | | |
|--------------------------|----------|-------|-----|-------|
| | Airtel | BSNL | JIO | VIL |
| % of Time Spent on 3G/4G | 100 | 86.64 | 100 | 99.02 |

Summary

SSA Level Summary- Voice

| Voice Call | 2G | | |
|-----------------------|--------|-------|-------|
| | Airtel | BSNL | VIL |
| Call Attempt | 655 | 664 | 676 |
| Blocked Call Rate (%) | 0.00 | 1.2 | 0.296 |
| CSSR% (Accessibility) | 100 | 98.8 | 99.7 |
| Drop Call Rate (%) | 0.00 | 0.30 | 0.148 |
| Mobility HOSR (%) | 97.38 | 98.7 | 99.31 |
| Rx Quality (%) | 95.18 | 99.51 | 99.33 |

| Voice Call | BSNL 3G | VIL 3G | VoLTE | | |
|-----------------------|---------|--------|--------------|-----------|-----------|
| | | | Airtel VoLTE | JIO VoLTE | VIL VoLTE |
| Call Attempt | 656 | 664 | 610 | 648 | 664 |
| Blocked Call Rate (%) | 1.2 | 0.45 | 0.00 | 0 | 0 |
| CSSR% (Accessibility) | 98.8 | 99.55 | 100 | 100 | 100 |
| Drop Call Rate (%) | 0.31 | 0.45 | 0.00 | 0 | 0.30 |
| Mobility HOSR (%) | 99.0 | 100 | 99.68 | 99.26 | 99.7 |
| Rx Quality (%) | 98.97 | 96.1 | 86.40 | 92.92 | 97.47 |

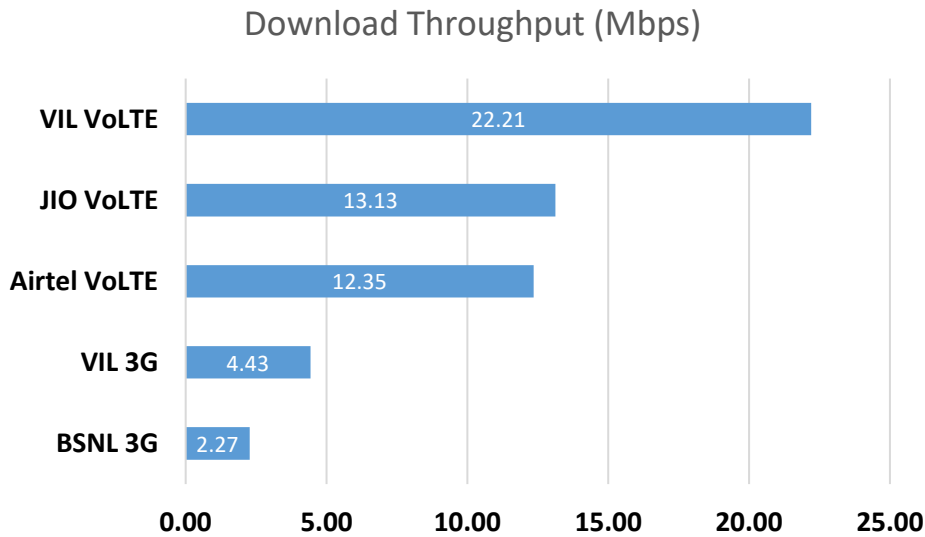
Data Services Dynamic

Key Observations

Dynamic Data was tested for 450Kms. Download Throughput was tested.

Data Download Performance (Mbps) - Dynamic

4G/ 3G Network:



| Data Services Dynamic | 3G / VOLTE | | | | |
|----------------------------|------------|--------|--------------|-----------|-----------|
| | BSNL 3G | VIL 3G | Airtel VoLTE | JIO VoLTE | VIL VoLTE |
| Download Throughput (Mbps) | 2.27 | 4.43 | 12.35 | 13.13 | 22.21 |

Data Services Static

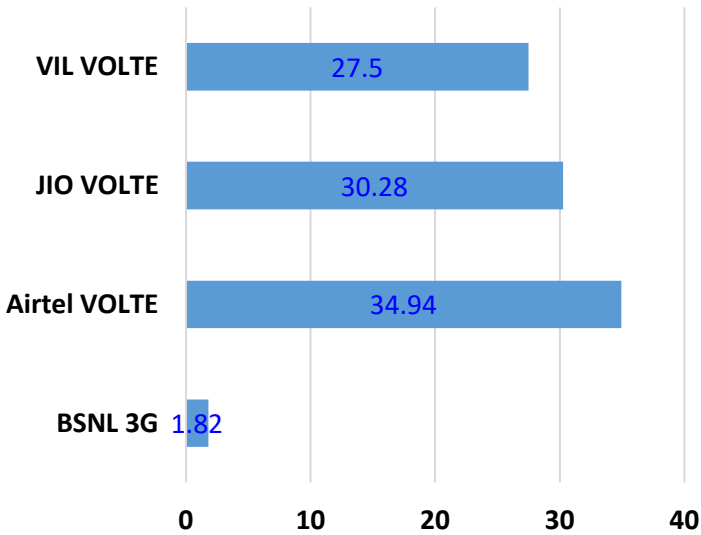
**Key Observations
(Average of 6
Hotspots)**

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

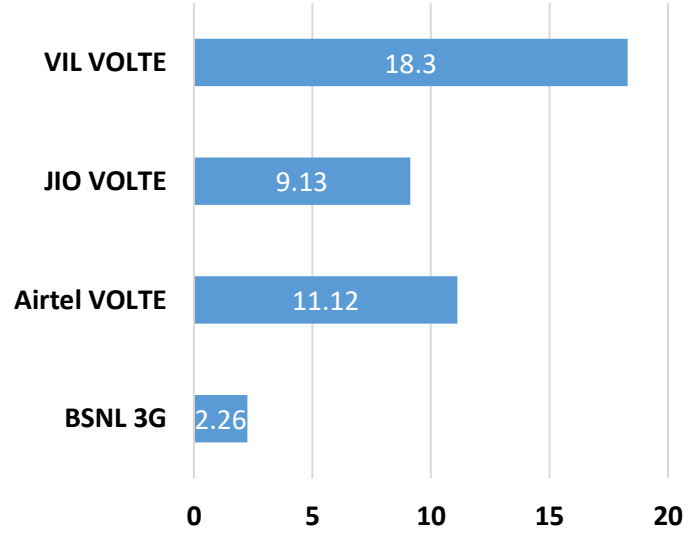
Data Download and Upload Performance (Mbps)

3G/4G Network:

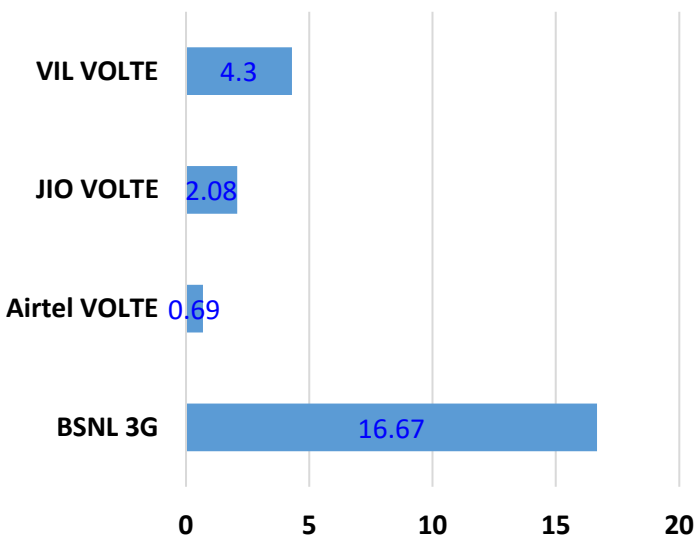
Download Throughput (Mbps)



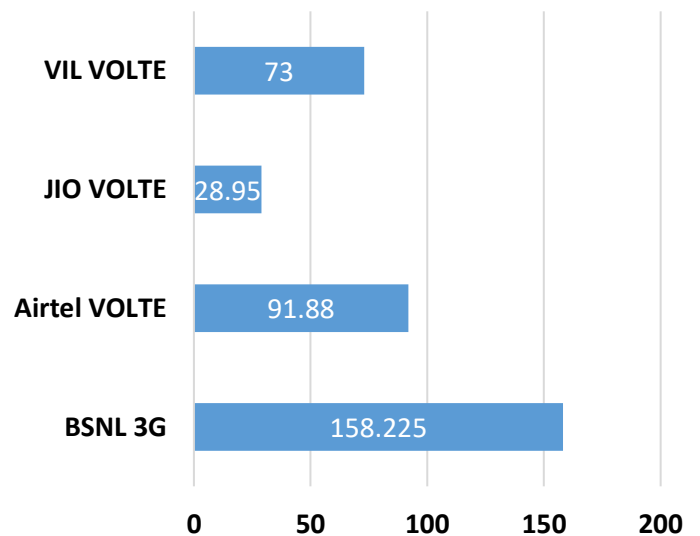
Upload Throughput (Mbps)



Web Browsing delay (Sec)



Latency (ms)



Summary

SSA Level Summary- (Average of 6 hotspots)- Data Services

| Data Services Static | 2G | | |
|----------------------------|--------|---------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 80.29 | 126.74 | 144.6 |
| Upload Throughput (kbps) | 70.02 | 155.885 | 80.0 |
| Web Browsing Delay (sec) | 13.88 | 26.92 | 20.1 |
| Latency (msec) | 305.94 | 309.47 | 287 |

| Data Services Static | 3G | LTE | | |
|----------------------------|---------|--------|-------|------|
| | BSNL | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 1.82 | 34.94 | 30.28 | 27.5 |
| Upload Throughput (Mbps) | 2.26 | 11.12 | 9.13 | 18.3 |
| Web Browsing Delay (sec) | 16.67 | 0.69 | 2.08 | 4.3 |
| Latency (msec) | 158.225 | 91.88 | 28.95 | 73 |

| CMCH Ranipet | 2G | | |
|----------------------------|--------|--------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 41 | 118.6 | 191.0 |
| Upload Throughput (kbps) | 42.33 | 163.28 | 106.5 |
| Web Browsing Delay (sec) | 12.882 | 28.40 | 8.1 |
| Latency (msec) | 303.33 | 362.33 | 367 |

| Collectrate Tirupattur | 2G | | |
|----------------------------|--------|--------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 79.5 | 122.06 | 101.4 |
| Upload Throughput (kbps) | 85.43 | 148.77 | 76.7 |
| Web Browsing Delay (sec) | 25.07 | 28.72 | 6.1 |
| Latency (msec) | 254.66 | 257.33 | 311 |

| Tiruvannamalai Temple | 2G | | |
|----------------------------|--------|--------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 76.76 | 126.1 | 164.5 |
| Upload Throughput (kbps) | 151.96 | 171.58 | 103.1 |
| Web Browsing Delay (sec) | 21.076 | 27.11 | 6.4 |
| Latency (msec) | 260 | 406.33 | 275 |

| Golden Temple Vellore | 2G | | |
|----------------------------|--------|--------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 41.2 | 198.29 | 123.6 |
| Upload Throughput (kbps) | 34.36 | 204.26 | 50.2 |
| Web Browsing Delay (sec) | 12.241 | 25.59 | 6.9 |
| Latency (msec) | 340 | 260 | 232 |

| Railway Station Katpadi | 2G | | |
|----------------------------|--------|-------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 76.2 | 79.2 | 182.1 |
| Upload Throughput (kbps) | 73.56 | 79.2 | 53.7 |
| Web Browsing Delay (sec) | 6.57 | 27.49 | 24.5 |
| Latency (msec) | 298.66 | 203.5 | 283 |

| New Busstand Vellore | 2G | | |
|----------------------------|--------|--------|-------|
| | Airtel | BSNL | VIL |
| Download Throughput (kbps) | 167.06 | 116.19 | 105.1 |
| Upload Throughput (kbps) | 32.46 | 168.22 | 89.7 |
| Web Browsing Delay (sec) | 5.417 | 24.19 | 68.4 |
| Latency (msec) | 369 | 357.33 | 243 |

| CMCH Ranipet | BSNL | LTE | | |
|----------------------------|-------|--------|-------|------|
| | 3G | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 1.54 | 25.67 | 27.46 | 7.0 |
| Upload Throughput (Mbps) | 1.96 | 8.69 | 16.71 | 16.3 |
| Web Browsing Delay (sec) | 14.17 | 0.644 | 2.03 | 0.7 |
| Latency (msec) | 351 | 98.66 | 32.67 | 80 |

| Collectrate Tirupattur | BSNL | LTE | | |
|----------------------------|--------|--------|-------|------|
| | 3G | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 1.54 | 28.92 | 26.25 | 61.2 |
| Upload Throughput (Mbps) | 2.41 | 8.60 | 7.80 | 21.5 |
| Web Browsing Delay (sec) | 15.13 | 0.839 | 2.09 | 5.1 |
| Latency (msec) | 141.67 | 89 | 30.61 | 93 |

| Tiruvannamalai Temple | BSNL | LTE | | |
|----------------------------|--------|--------|-------|------|
| | 3G | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 0.98 | 20.29 | 46.98 | 25.9 |
| Upload Throughput (Mbps) | 1.25 | 12.59 | 8.68 | 18.7 |
| Web Browsing Delay (sec) | 17.43 | 0.712 | 2.05 | 4.9 |
| Latency (msec) | 149.67 | 90 | 26.17 | 51 |

| Golden Temple Vellore | BSNL | LTE | | |
|----------------------------|--------|--------|-------|------|
| | 3G | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 3.6 | 57.80 | 23.43 | 35.8 |
| Upload Throughput (Mbps) | 4.08 | 17.18 | 7.97 | 8.5 |
| Web Browsing Delay (sec) | 8.60 | 0.657 | 2.12 | 47 |
| Latency (msec) | 114.67 | 90.66 | 30.39 | 74 |

| Railway Station Katpadi | BSNL | LTE | | |
|----------------------------|-------|--------|-------|------|
| | 3G | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 1.95 | 57.32 | 38.44 | 19.3 |
| Upload Throughput (Mbps) | 2.38 | 18.00 | 6.28 | 30.9 |
| Web Browsing Delay (sec) | 17.80 | 0.676 | 2.05 | 5.2 |
| Latency (msec) | 89.67 | 91.66 | 25.89 | 73 |

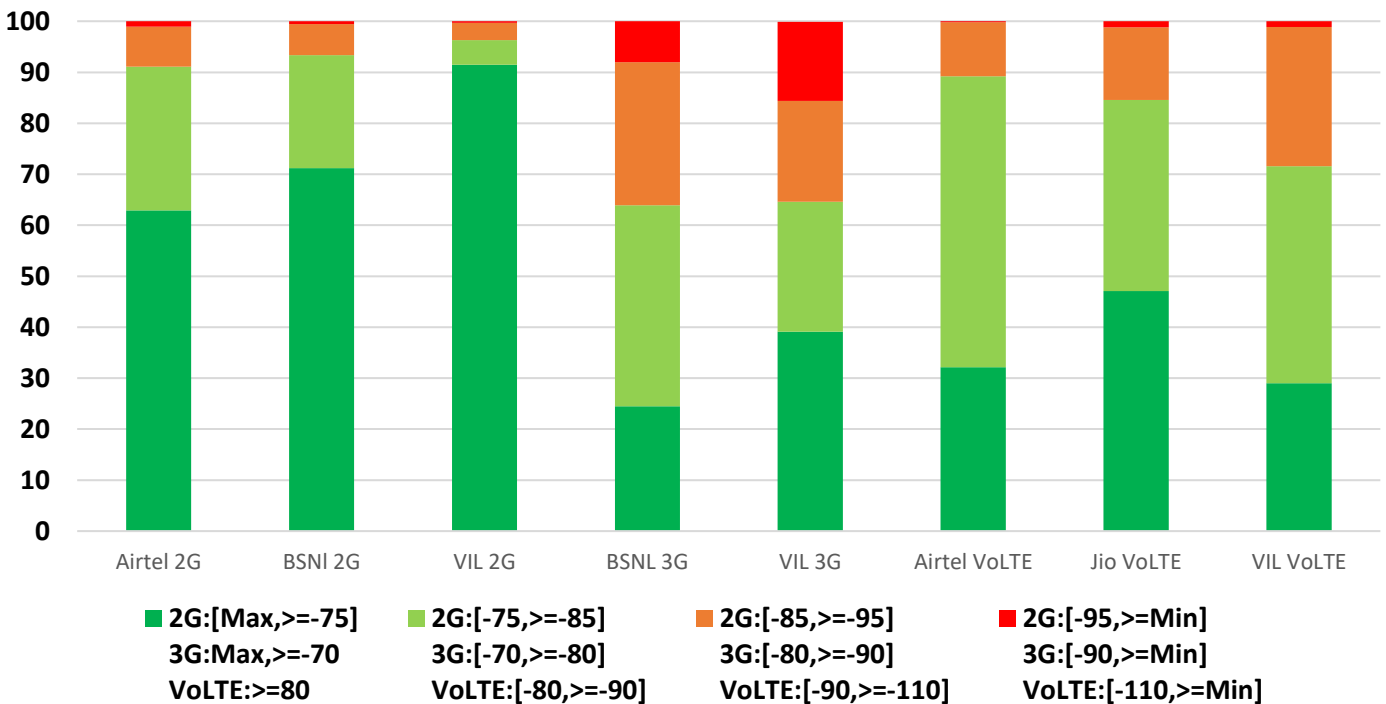
| New Busstand Vellore | BSNL | LTE | | |
|----------------------------|--------|--------|-------|------|
| | 3G | Airtel | JIO | VIL |
| Download Throughput (Mbps) | 1.3 | 19.62 | 19.07 | 15.5 |
| Upload Throughput (Mbps) | 1.49 | 16.58 | 7.28 | 13.9 |
| Web Browsing Delay (sec) | 17.24 | 0.683 | 2.15 | 5.3 |
| Latency (msec) | 102.67 | 91.34 | 28 | 66 |

I. Coverage Details

RF Coverage relates to the geographical footprint within the system that has sufficient RF signal strength to provide for a call session. The Coverage rate is calculated on the basis of % of samples in which the Rx level ≥ -85 dBm, RSCP is ≥ -90 dBm & RSRP ≥ -110 dBm. The details are as follows.

| TSP | Coverage Rate % |
|--------------|-----------------|
| Airtel 2G | 91.13 |
| BSNL 2G | 93.38 |
| VIL 2G | 96.27 |
| VIL 3G | 84.4 |
| BSNL 3G | 91.95 |
| Airtel VoLTE | 99.80 |
| Jio VoLTE | 98.83 |
| VIL VoLTE | 98.9 |

Coverage Distribution

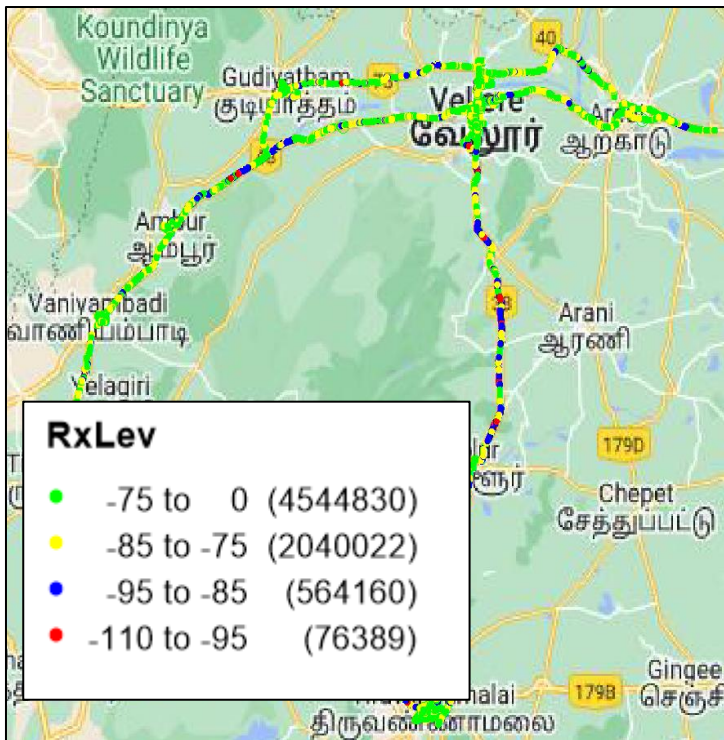


I. Coverage Details

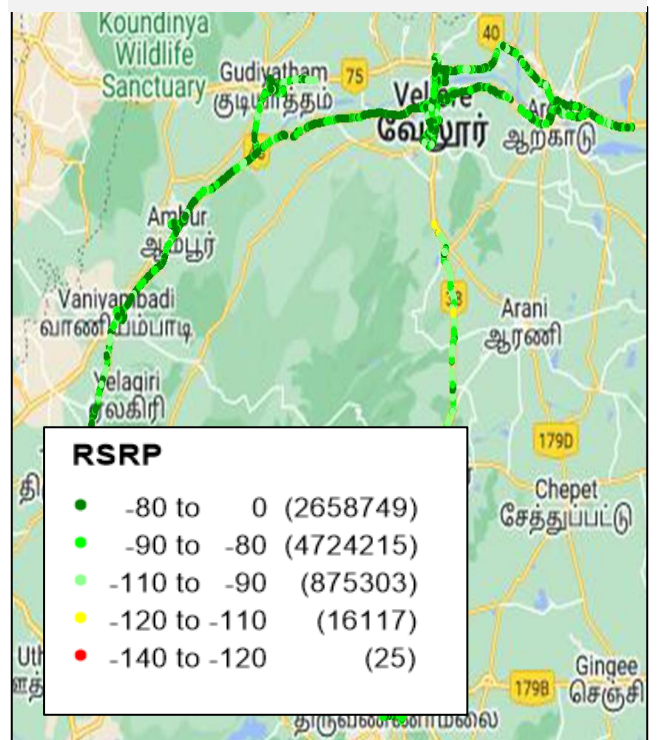
AIRTEL

| Technology | Coverage Rate % |
|------------|-----------------|
| 2G | 91.13 |
| 4G | 99.80 |

2G



VoLTE



| Overall Rx Level | # Samples | % PDF |
|------------------|-----------|-------|
| [Max, >=-75] | 4544830 | 62.90 |
| [-75, >=-85) | 2040022 | 28.23 |
| [-85, >=-95) | 564160 | 7.81 |
| [-95, >=Min) | 76389 | 1.06 |
| Total | 7225401 | 100 |

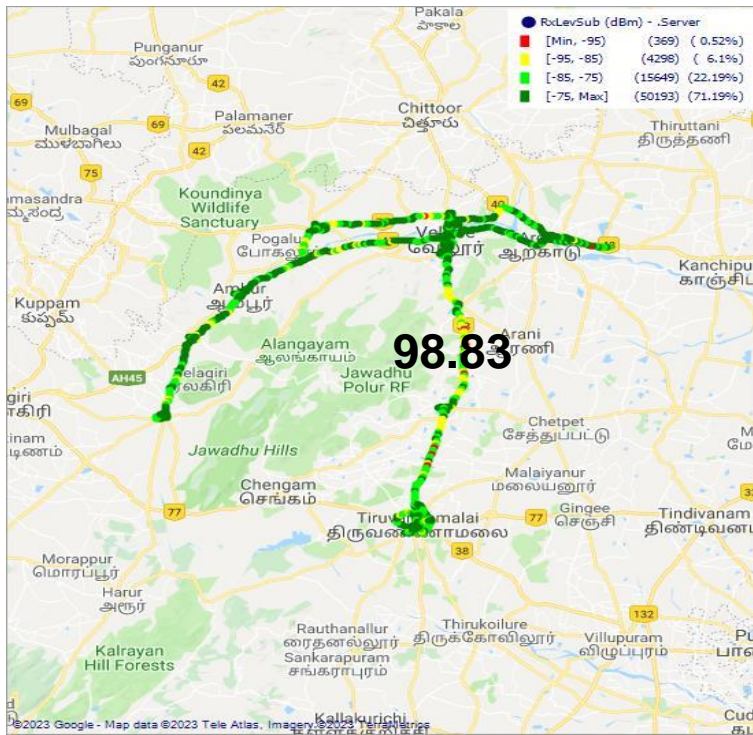
| Overall RSRP | # Samples | % PDF |
|---------------|-----------|-------|
| [Max, >=-80] | 2658749 | 32.13 |
| [-80, >=-90) | 4724215 | 57.09 |
| [-90, >=-110) | 875303 | 10.58 |
| [-110, >=Min) | 16142 | 0.2 |
| Total | 8274409 | 100 |

I. Coverage Details

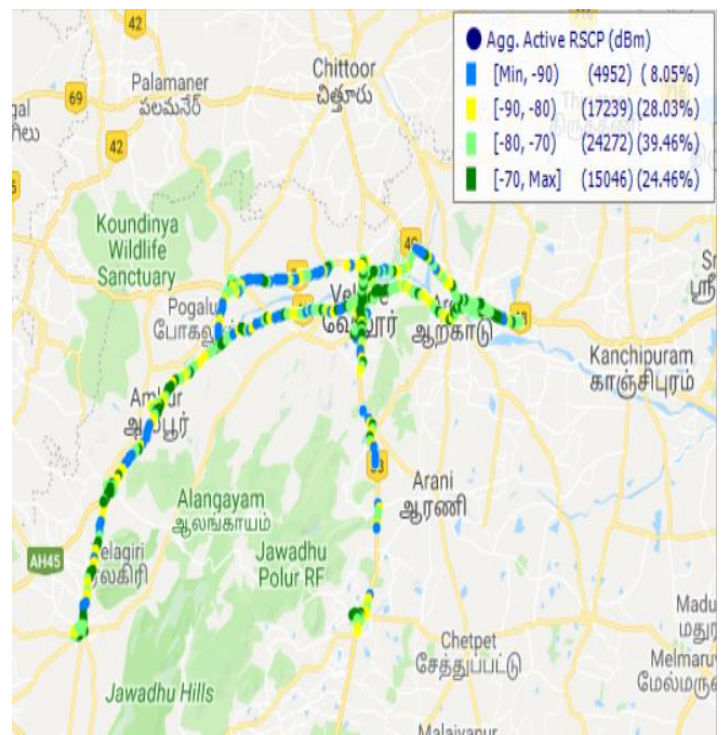
BSNL

| Technology | Coverage Rate % |
|------------|-----------------|
| 2G | 93.38 |
| 3G | 91.95 |

2G



3G



2G

| Overall RxLevel | # Samples | % PDF |
|-----------------|--------------|------------|
| [Max, >=-75] | 50193 | 71.19 |
| [-75, >=-85) | 15649 | 22.19 |
| [-85, >=-95) | 4298 | 6.1 |
| [-95, >=Min) | 369 | 0.52 |
| Total | 70509 | 100 |

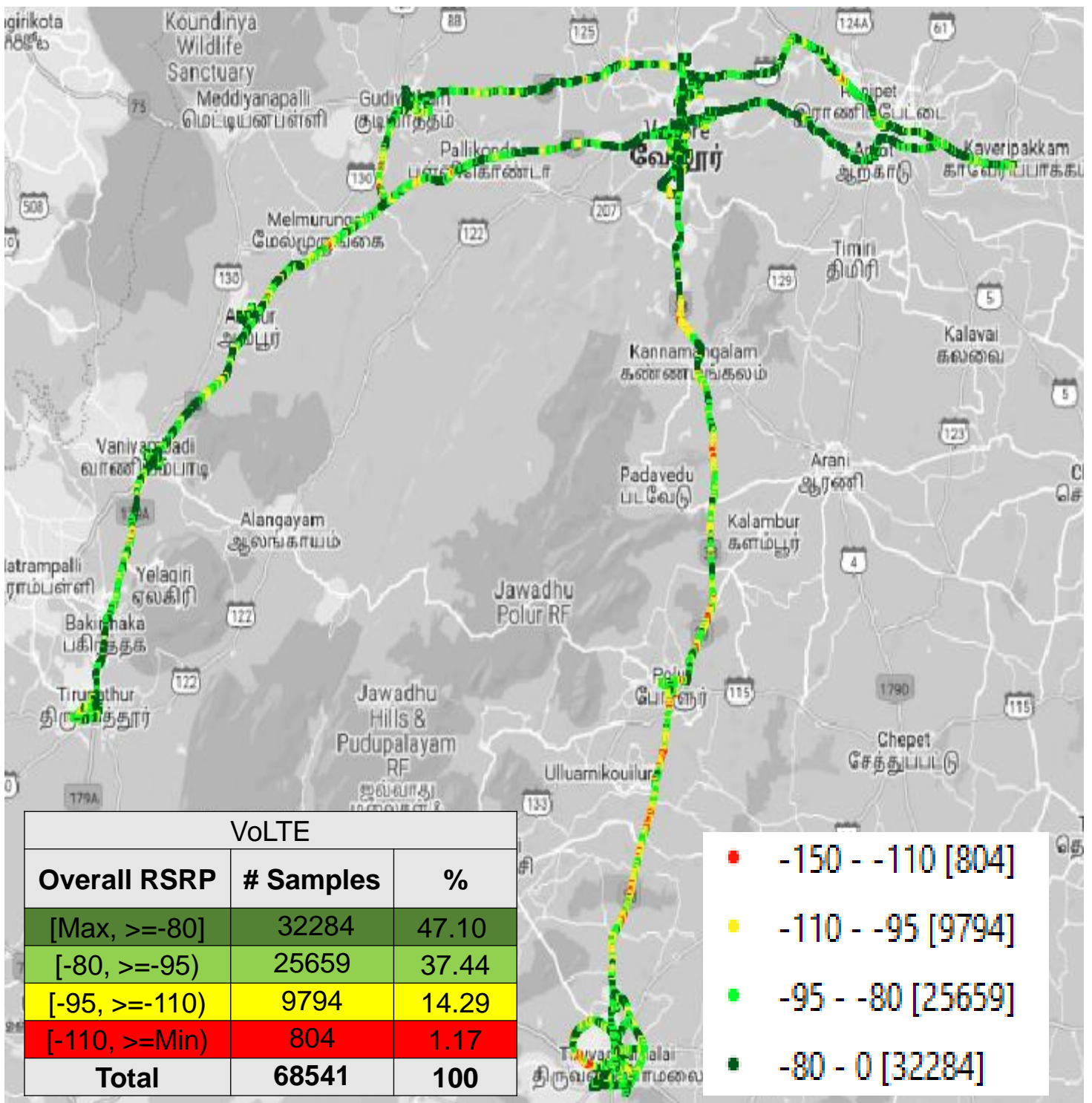
3G

| Overall RSCP | # Samples | % PDF |
|--------------|--------------|------------|
| [Max, >=-70] | 15046 | 24.46 |
| [-70, >=-80) | 24272 | 39.46 |
| [-80, >=-90) | 17239 | 28.03 |
| [-90, >=Min) | 4952 | 8.05 |
| Total | 61509 | 100 |

I. Coverage Details

JIO

| Technology | Coverage Rate % |
|------------|-----------------|
| VoLTE | 98.83 |

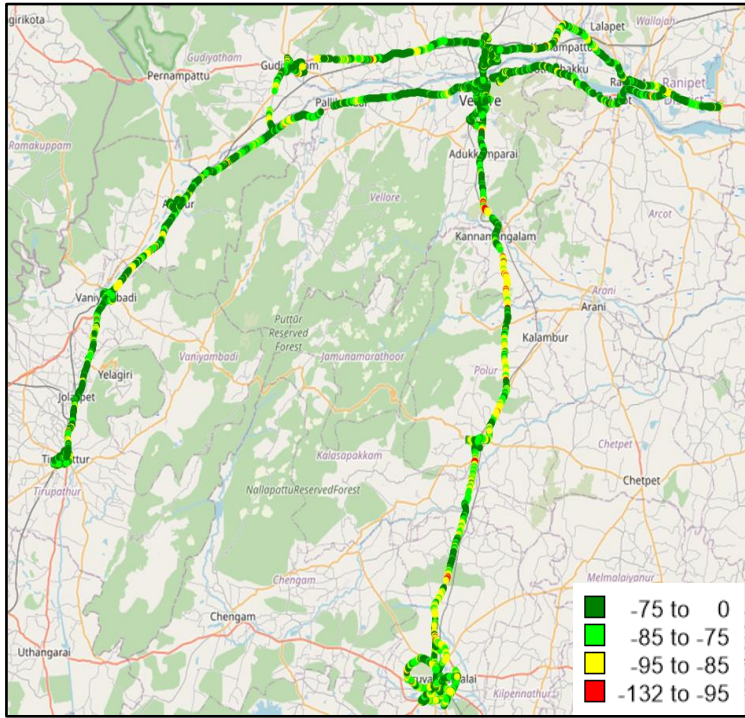


I. Coverage Details

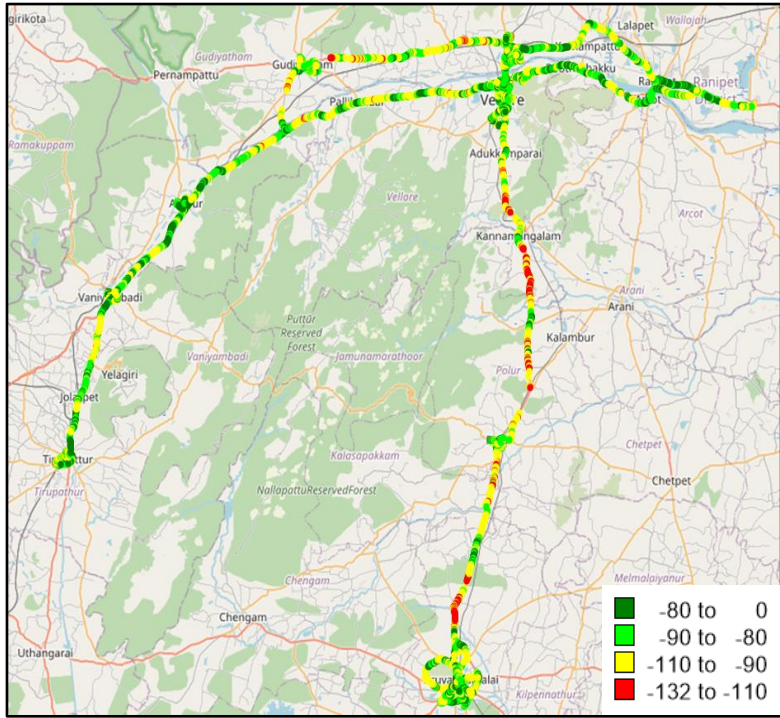
VIL

| TSP | Coverage Rate % |
|-----------|-----------------|
| VIL 2G | 96.27 |
| VIL VoLTE | 98.9 |

2G



VoLTE



| Overall Rx Level | # Samples | % PDF |
|------------------|-----------------|------------|
| [Max, >=-75] | 20971548 | 91.5 |
| [-75, >=-85) | 1094956 | 4.8 |
| [-85, >=-95) | 784740 | 3.4 |
| [-95, >=Min) | 71308 | 0.3 |
| Total | 22922552 | 100 |

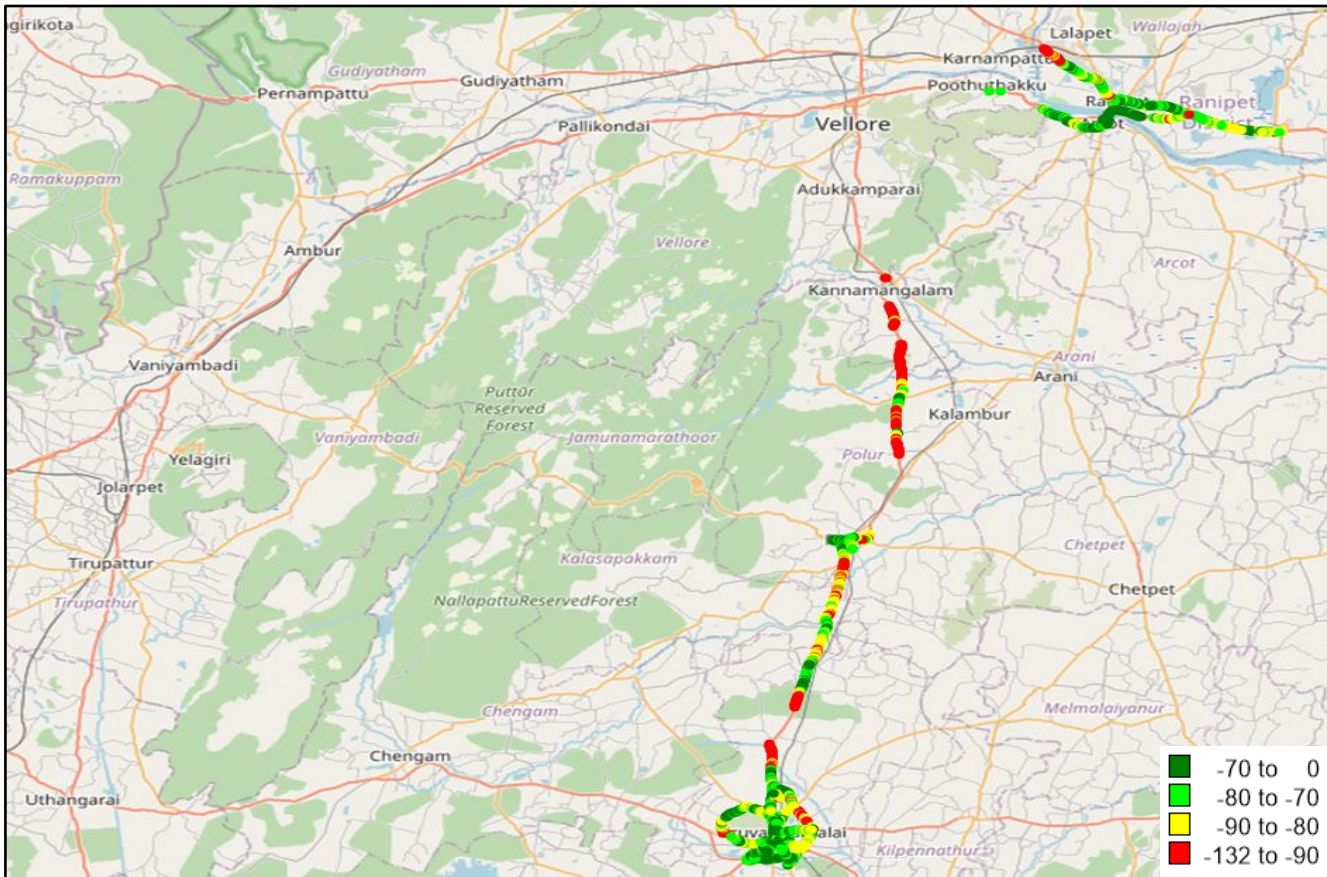
| Overall RSRP | # Samples | % PDF |
|---------------|-----------------|------------|
| [Max, >=-80] | 6669958 | 29 |
| [-80, >=-90) | 9762158 | 42.6 |
| [-90, >=-110) | 6249327 | 27.3 |
| [-110, >=Min) | 241109 | 1.1 |
| Total | 22922552 | 100 |

I. Coverage Details

VIL

| TSP | Coverage Rate % |
|--------|-----------------|
| VIL 3G | 84.4 |

3G Coverage

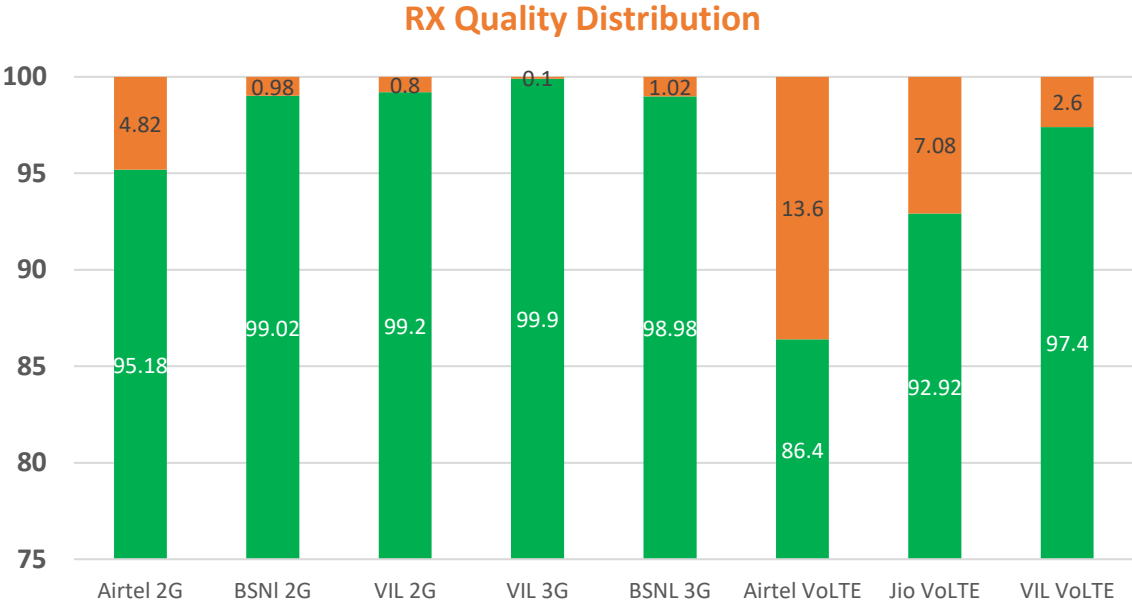


| Overall RSCP | # Samples | % PDF |
|--------------|---------------|--------------|
| [Max, >=-70] | 360944 | 39.1 |
| [-70, >=-80] | 242129 | 25.5 |
| [-80, >=-90] | 188187 | 19.8 |
| [-90, >=Min) | 147077 | 15.5 |
| Total | 948336 | 100.0 |

II. Quality Details

For measuring voice quality, as per the QoS norms, Rx Qual ≤ 5 for GSM TSPs, EcNo ≥ -14 dBm for 3G TSPs and SINR > 0 in case of VoLTE is considered to be good, whereas quality beyond this benchmark is considered to be bad. The benchmark should usually be $\geq 95\%$.

| TSP | Rx Quality % |
|--------------|--------------|
| Airtel 2G | 95.18 |
| BSNI 2G | 99.02 |
| VIL 2G | 99.2 |
| VIL 3G | 99.9 |
| BSNL 3G | 98.98 |
| Airtel VoLTE | 86.40 |
| Jio VoLTE | 92.92 |
| VIL VoLTE | 97.4 |

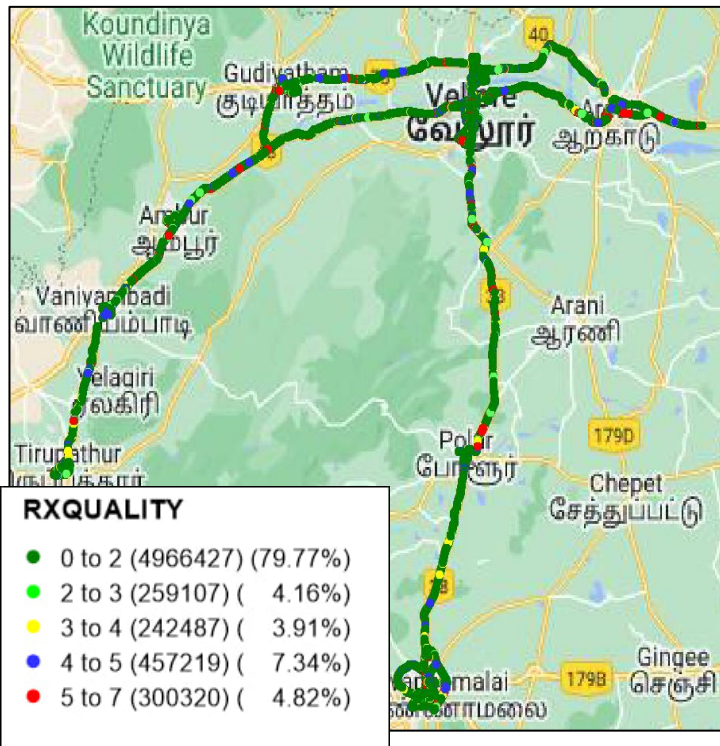


II. Quality Details

AIRTEL

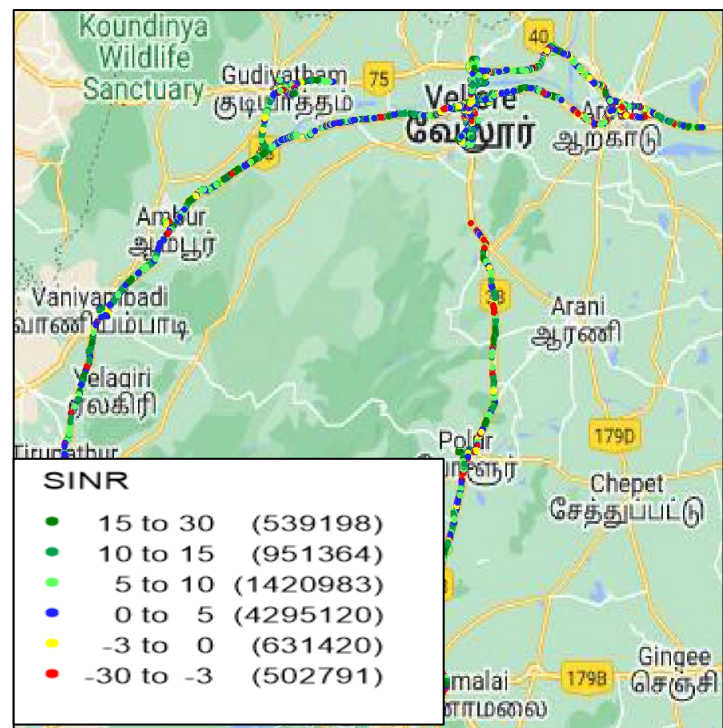
| Technology | Rx Quality % |
|------------|--------------|
| 2G | 95.18 |
| 4G | 86.40 |

2G



| Overall Rx Quality | # Samples | % PDF |
|--------------------|----------------|------------|
| (Min, <=2) | 4966427 | 79.77 |
| (2, <=3) | 259107 | 4.16 |
| (3, <=4) | 242487 | 3.91 |
| (4, <=5) | 457219 | 7.34 |
| (5, <=Max) | 300320 | 4.82 |
| Total | 6225560 | 100 |

VoLTE



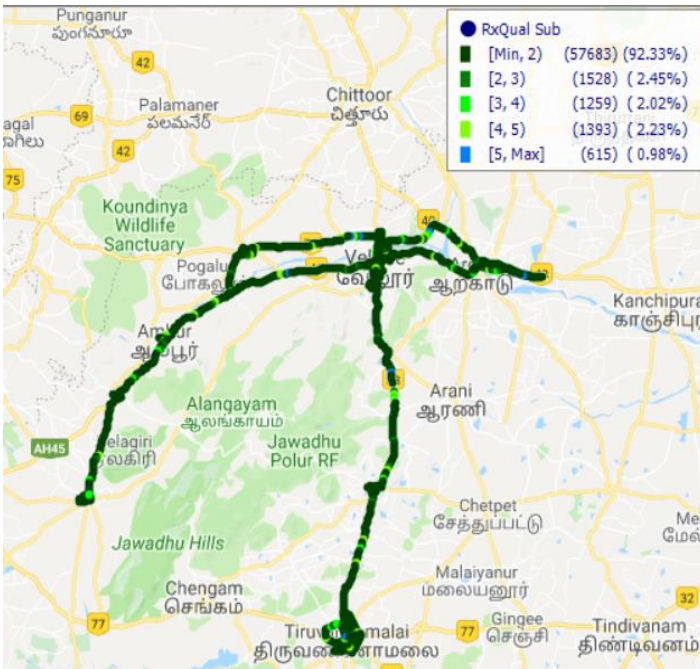
| Overall SINR | # Samples | % PDF |
|--------------|----------------|------------|
| (Min, <= -3) | 502791 | 6.03 |
| (-3, <=0) | 631420 | 7.57 |
| (0, <=5) | 4295120 | 51.49 |
| (5, <=10) | 1420983 | 17.04 |
| (10, <=15) | 951364 | 11.41 |
| (15, <=Max) | 539198 | 6.46 |
| Total | 8340876 | 100 |

II. Quality Details

BSNL

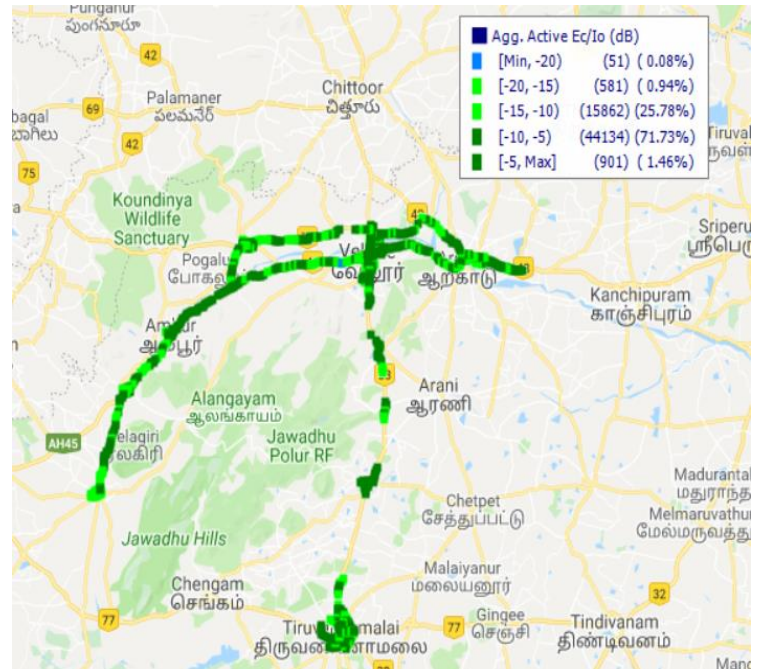
| Technology | Rx Quality % |
|------------|--------------|
| 2G | 99.02 |
| 3G | 98.98 |

2G



| Overall Rx Quality | # Samples | % PDF |
|--------------------|--------------|---------------|
| (Min, <=2) | 57683 | 92.33 |
| (2, <=3) | 1528 | 2.45 |
| (3, <=4) | 1259 | 2.02 |
| (4, <=5) | 1393 | 2.23 |
| (5, <=Max) | 615 | 0.98 |
| Total | 62478 | 100.00 |

3G

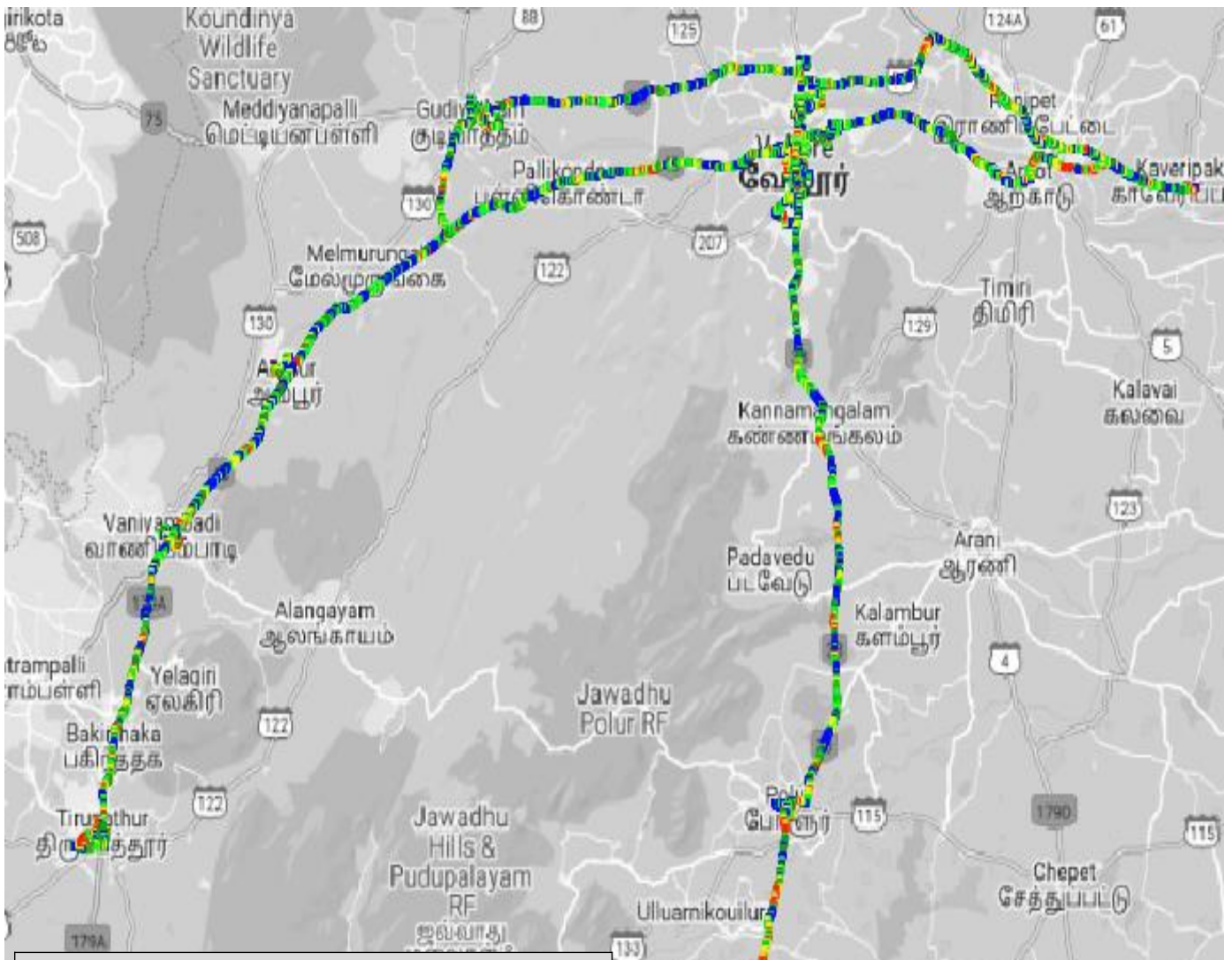


| Overall EC/I0 | # Samples | % PDF |
|---------------|--------------|------------|
| [Min, -20) | 51 | 0.08 |
| [-20, -15) | 581 | 0.94 |
| [-15, -10) | 15862 | 25.78 |
| [-10, -5) | 44134 | 71.73 |
| [-5, Max] | 901 | 1.46 |
| Total | 61529 | 100 |

II. Quality Details

JIO

| Technology | Rx Quality |
|------------|------------|
| VoLTE | 92.92 |



| VoLTE | | |
|--------------|--------------|------------|
| Overall SINR | # Samples | % |
| (15, <=Max) | 16250 | 23.71 |
| (10, <=15) | 15606 | 22.77 |
| (5, <=10) | 18999 | 27.72 |
| (0, <=5) | 12832 | 18.72 |
| (Min, <=0) | 4854 | 7.08 |
| Total | 68541 | 100 |

| | |
|---|-----------------|
| ■ | -20 - 0 [4854] |
| ■ | 0 - 5 [12832] |
| ■ | 5 - 10 [18999] |
| ■ | 10 - 15 [15606] |
| ■ | 15 - 30 [16250] |

II. Quality Details

VIL

Technology

2G

VoLTE

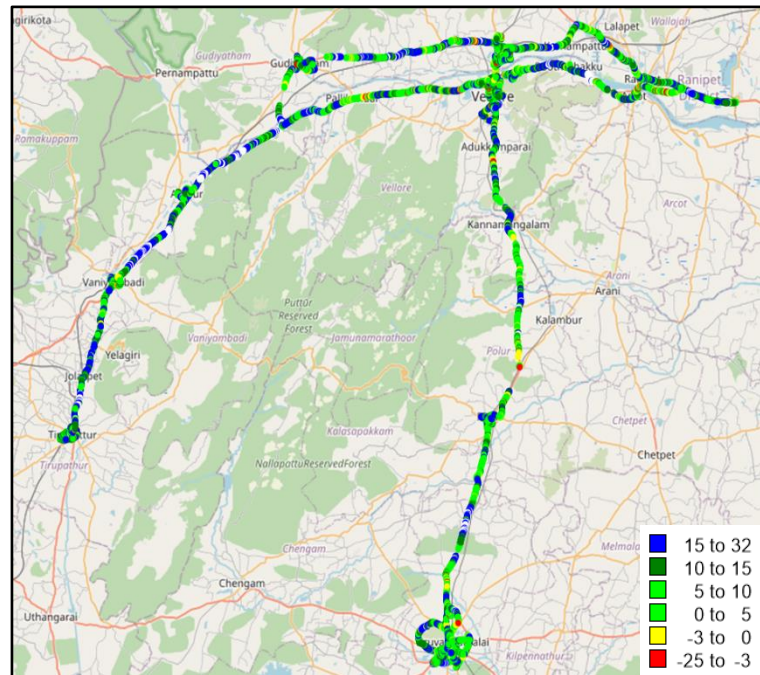
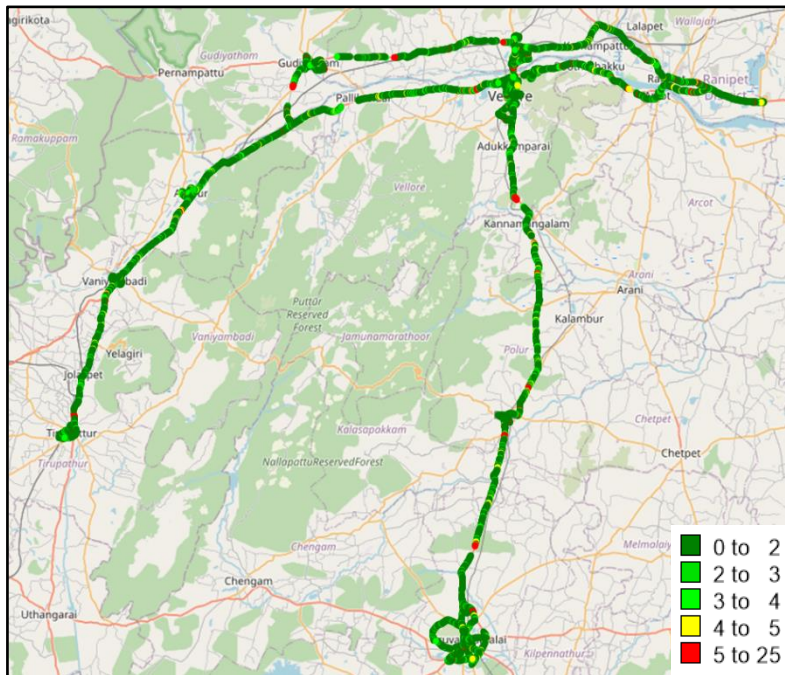
Rx Quality %

99.2

97.4

2G

VoLTE



| Overall Rx Quality | # Samples | % PDF |
|--------------------|-----------------|------------|
| (Min, <=2) | 22541170 | 98.3 |
| (2, <=3) | 64025 | 0.3 |
| (3, <=4) | 67335 | 0.3 |
| (4, <=5) | 69791 | 0.3 |
| (5, <=Max) | 180231 | 0.8 |
| Total | 22922552 | 100 |

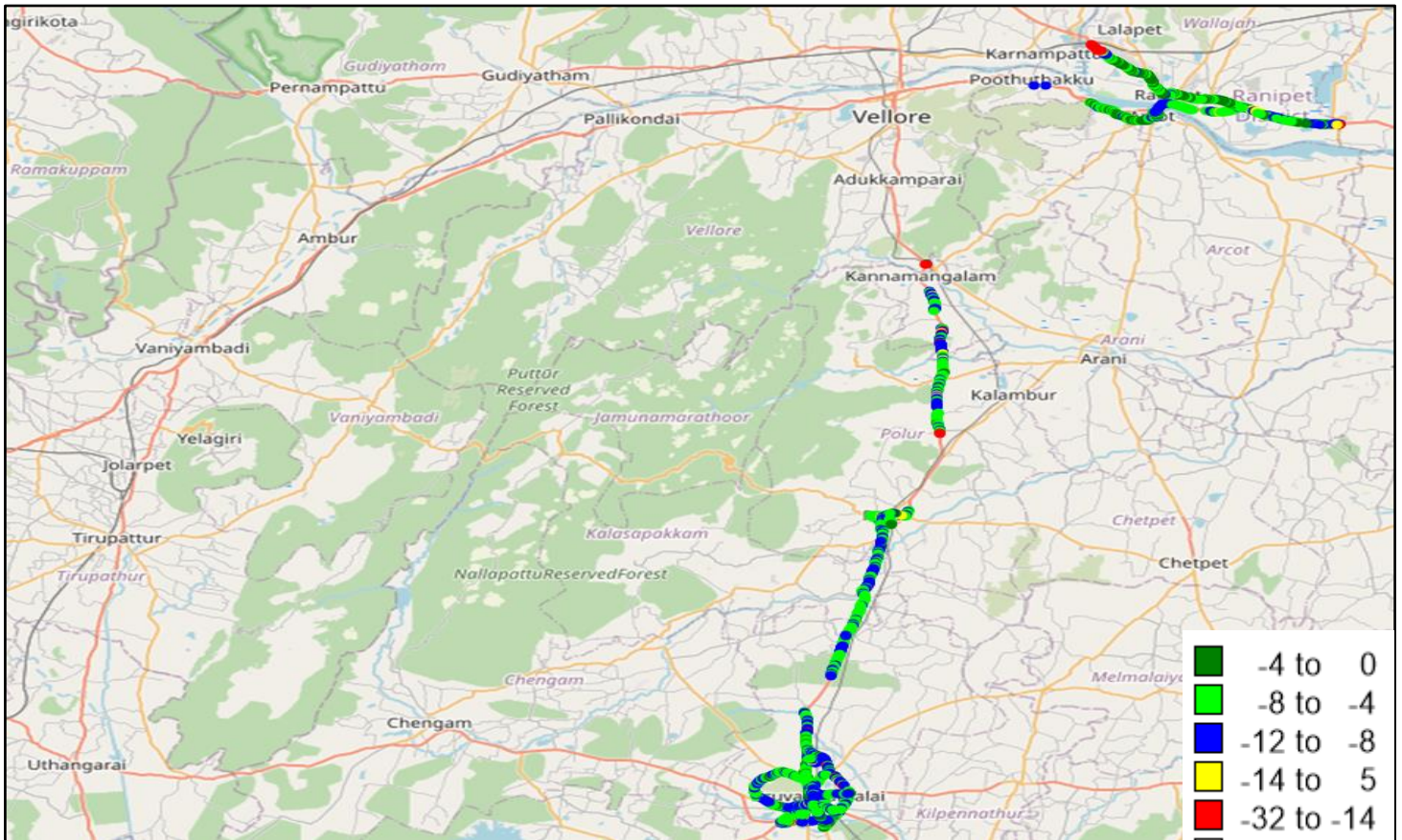
| Overall SINR | # Samples | % PDF |
|--------------|-----------------|------------|
| (Min, <= -3) | 416053 | 1.0 |
| (-3, <=0) | 670181 | 1.6 |
| (0, <=5) | 30574042 | 71.3 |
| (5, <=10) | 2973903 | 6.9 |
| (10, <=15) | 5423584 | 12.6 |
| (15, <=Max) | 2844789 | 6.6 |
| Total | 42902552 | 100 |

II. Quality Details

VIL

| TSP | Quality % |
|--------|-----------|
| VIL 3G | 99.9 |

3G

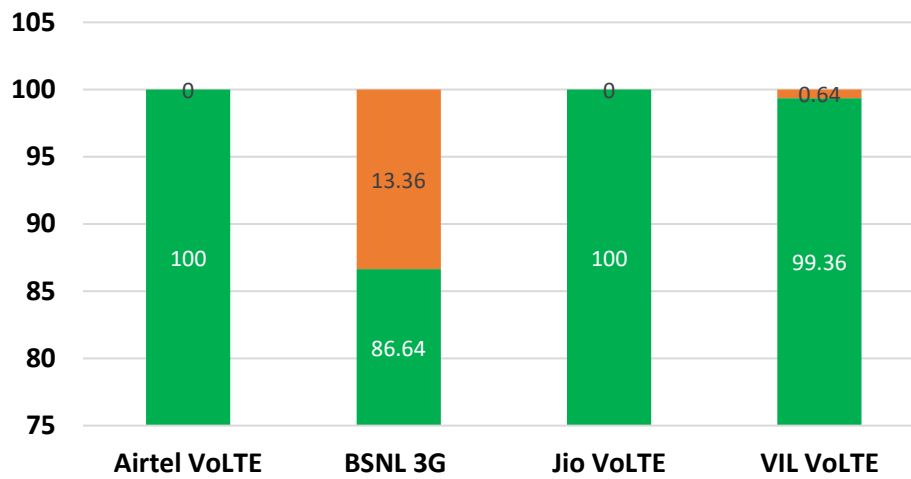


| Overall Rx Quality | # Samples | % PDF |
|--------------------|-----------|-------|
| (Max, <=-4) | 7135270 | 89.4 |
| (-4, <=-8) | 408913 | 5.1 |
| (-8, <=-12) | 364784 | 4.7 |
| (-12, <=-14) | 51071 | 0.6 |
| (-14, <=Min) | 11520 | 0.1 |

III. Technology Details

| TSP | % of Time Spent on 3G/VoLTE |
|--------------|-----------------------------|
| Airtel VoLTE | 100 |
| BSNL 3G | 86.64 |
| Jio VoLTE | 100 |
| VIL VoLTE | 99.36 |

Technology Distribution

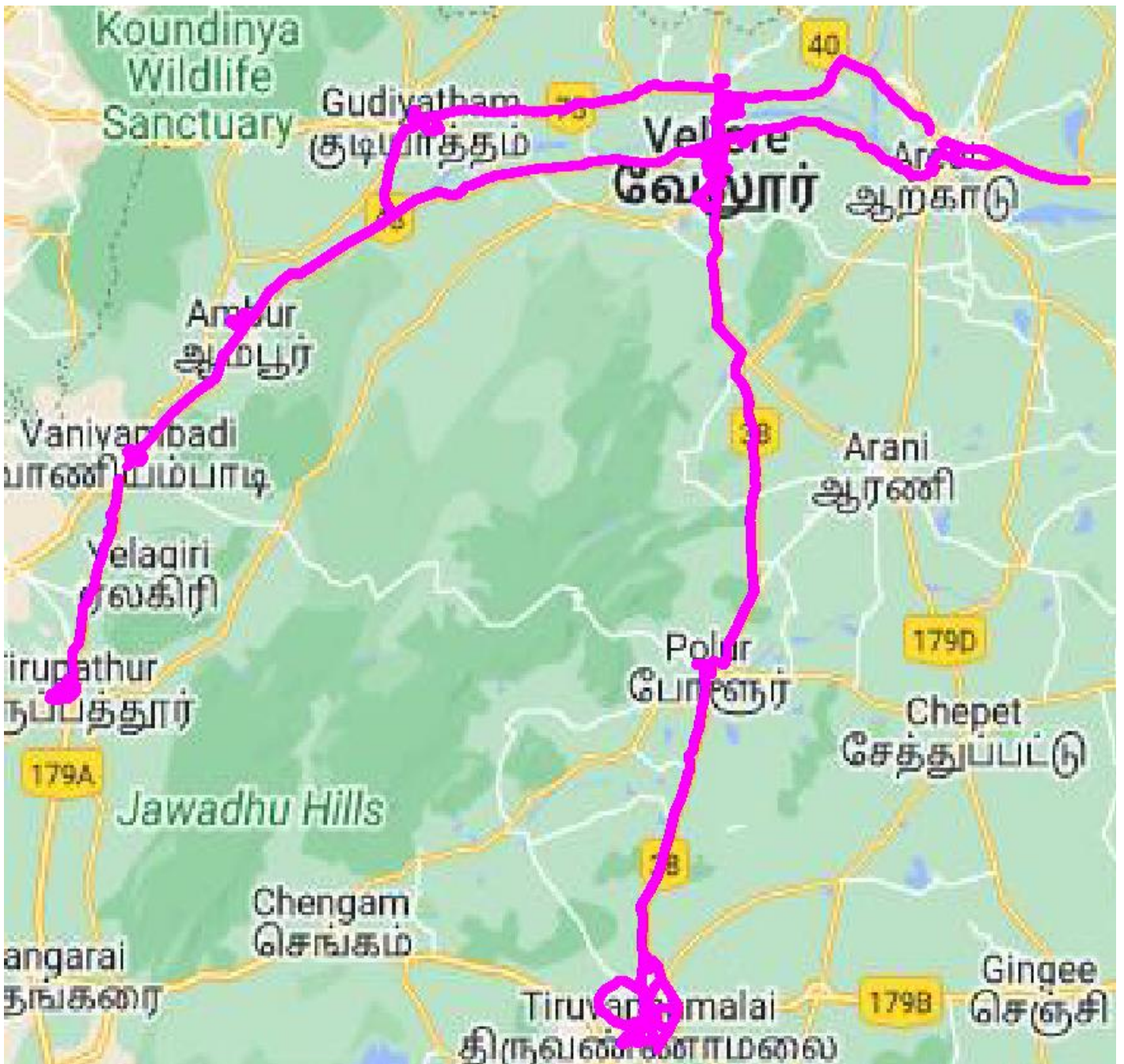


III. Technology Details

AIRTEL

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

4G

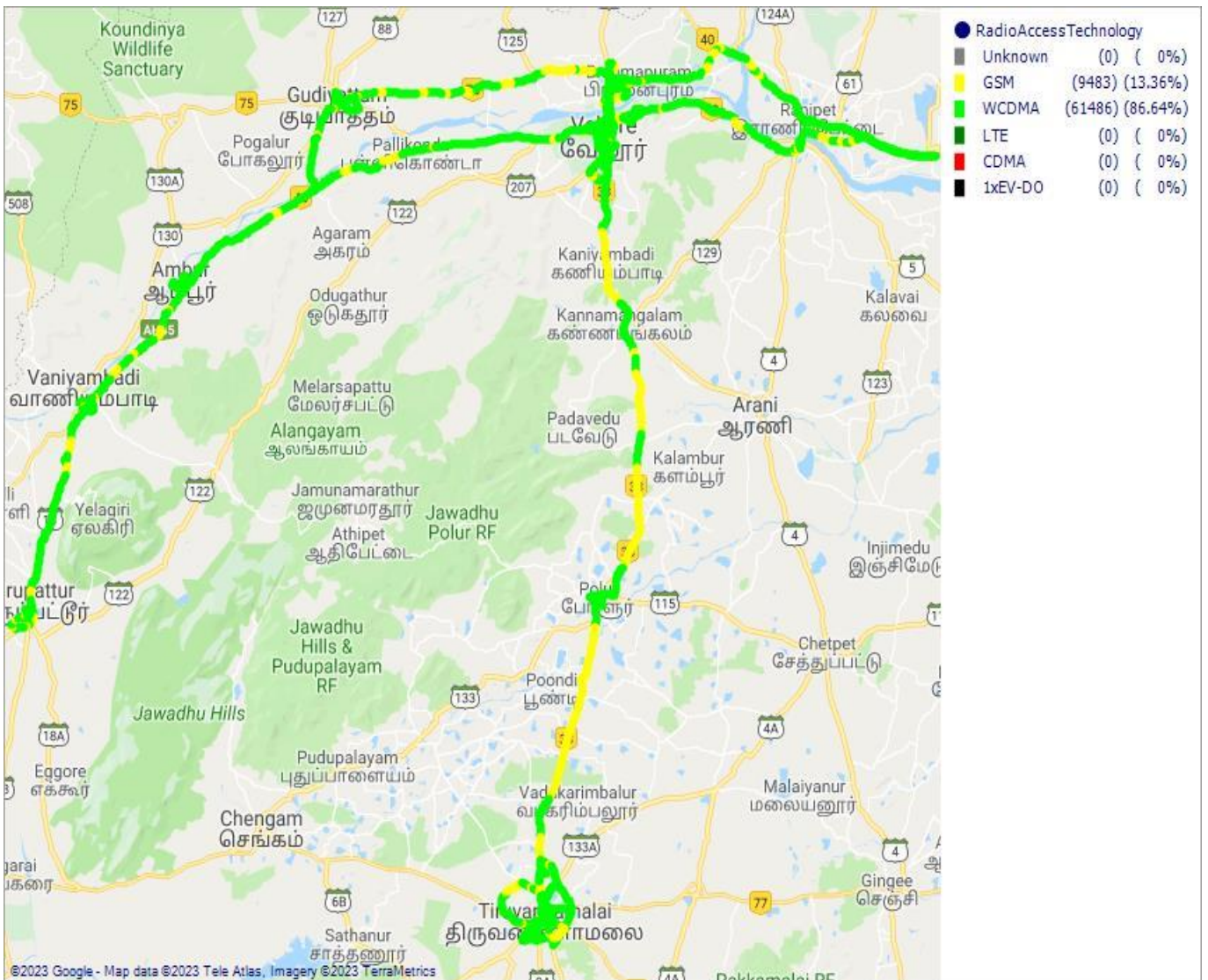


III. Technology Details

BSNL

| Technology | %Time Spent on 3G |
|------------|-------------------|
| 3G | 86.64 |

3G

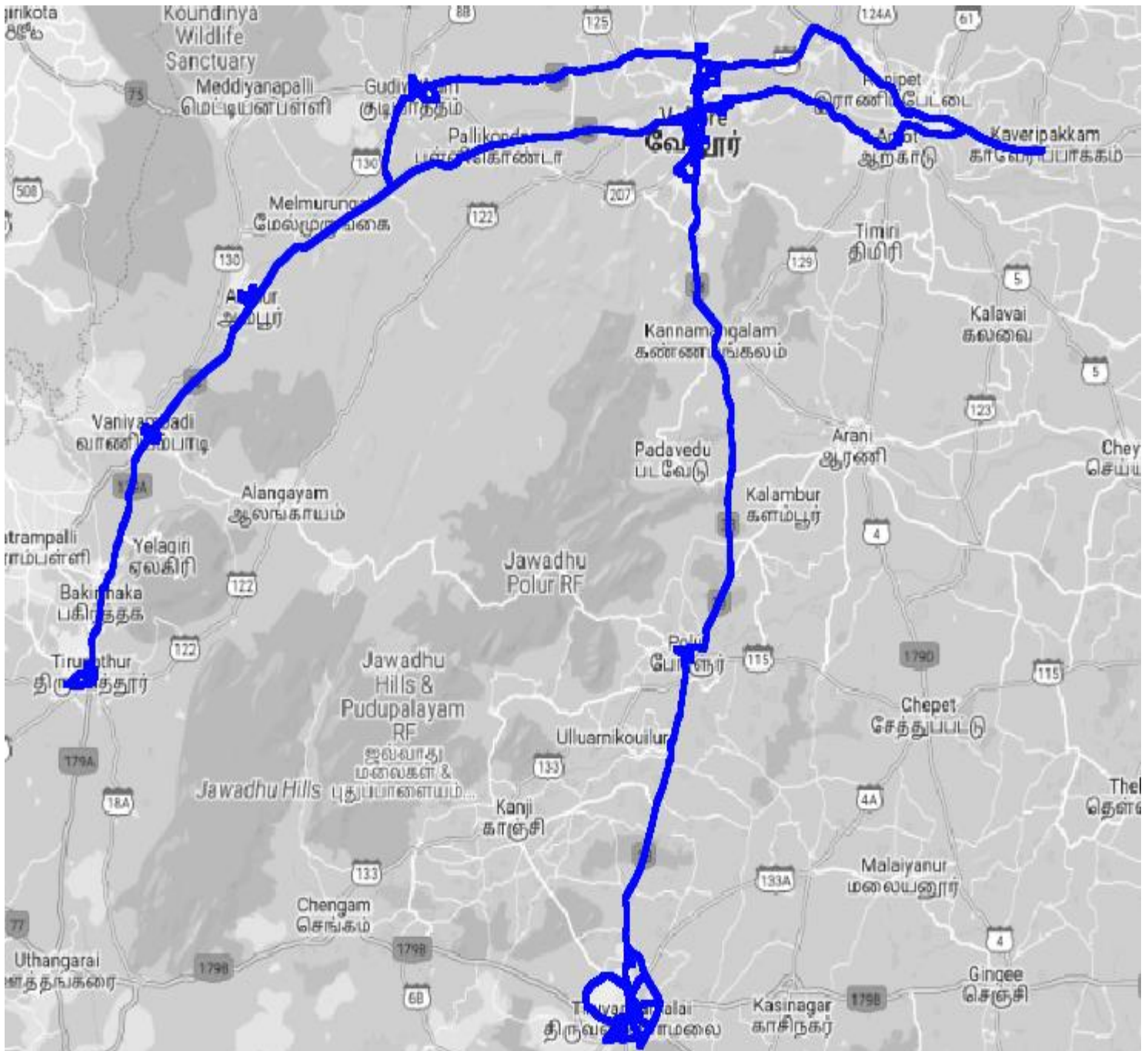


III. Technology Details

JIO

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

4G

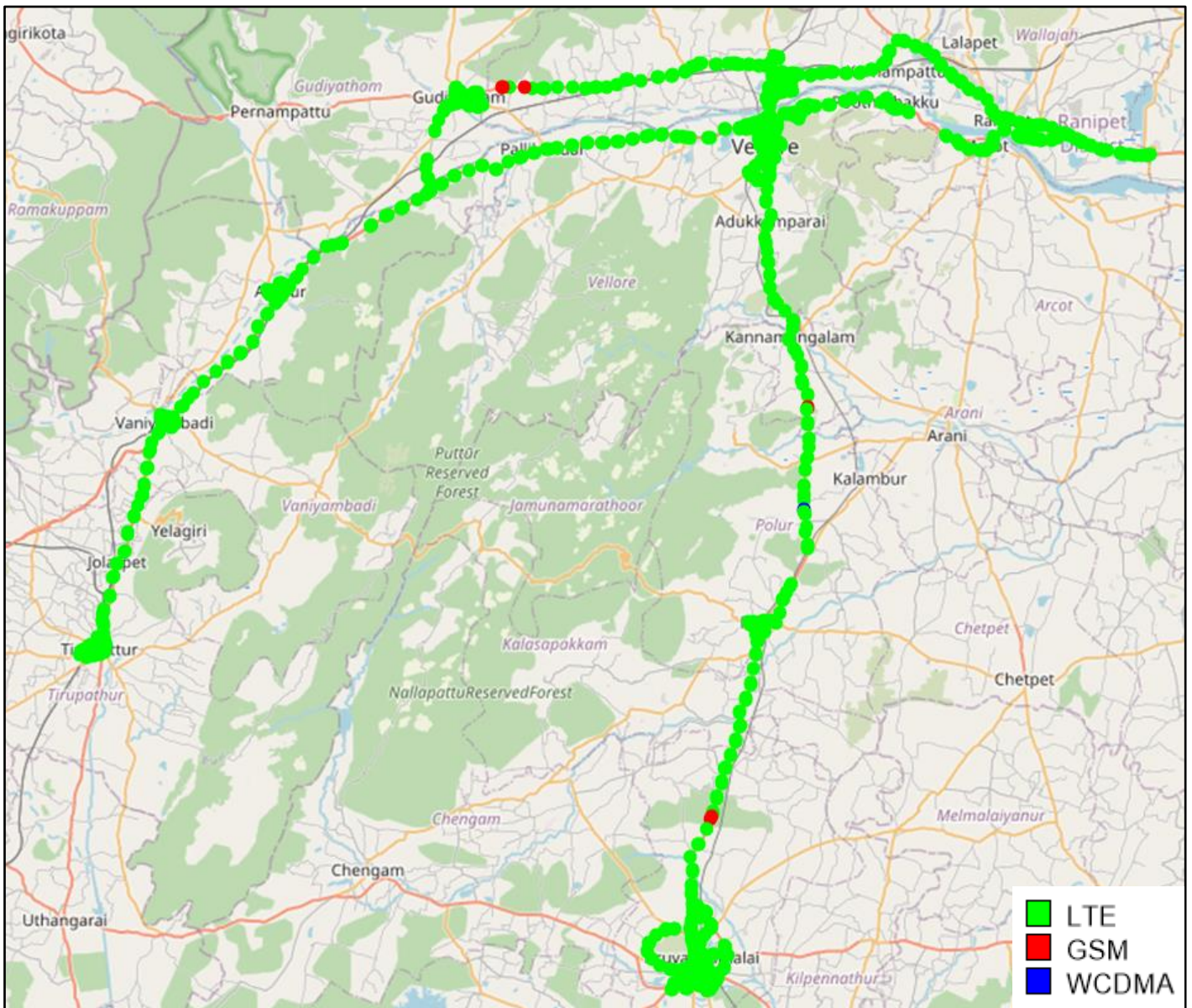


III. Technology Details

VIL

| Technology | %Time Spent on 4G |
|------------|-------------------|
| 4G | 99.36 |

4G

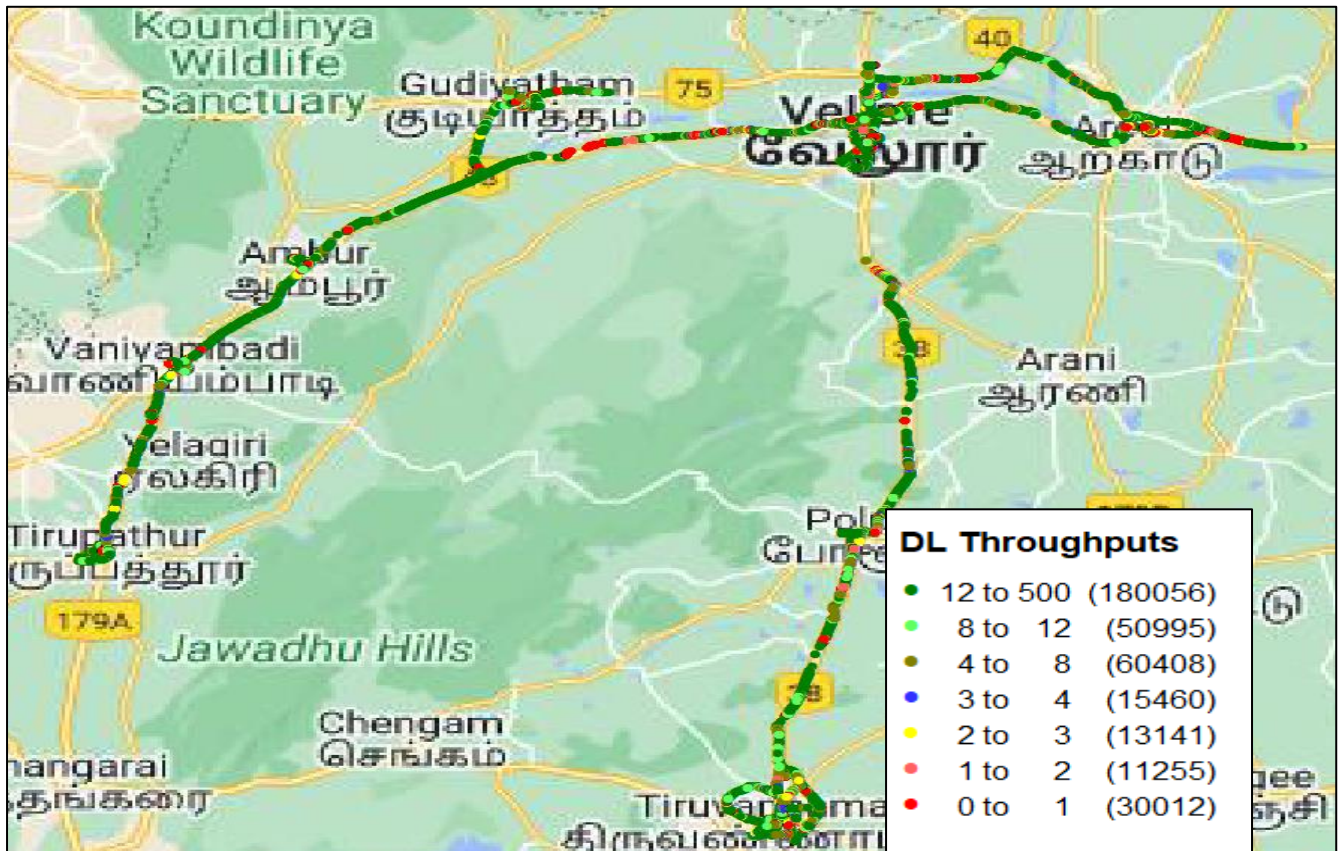


IV. Dynamic Data Test- 4G DL Details

AIRTEL

Data Statistics - Dynamic Complete SSA - 450 Kms

| Data KPIs - Overall | 4G |
|----------------------------|------------|
| Download Throughput (Mbps) | 12.35 Mbps |



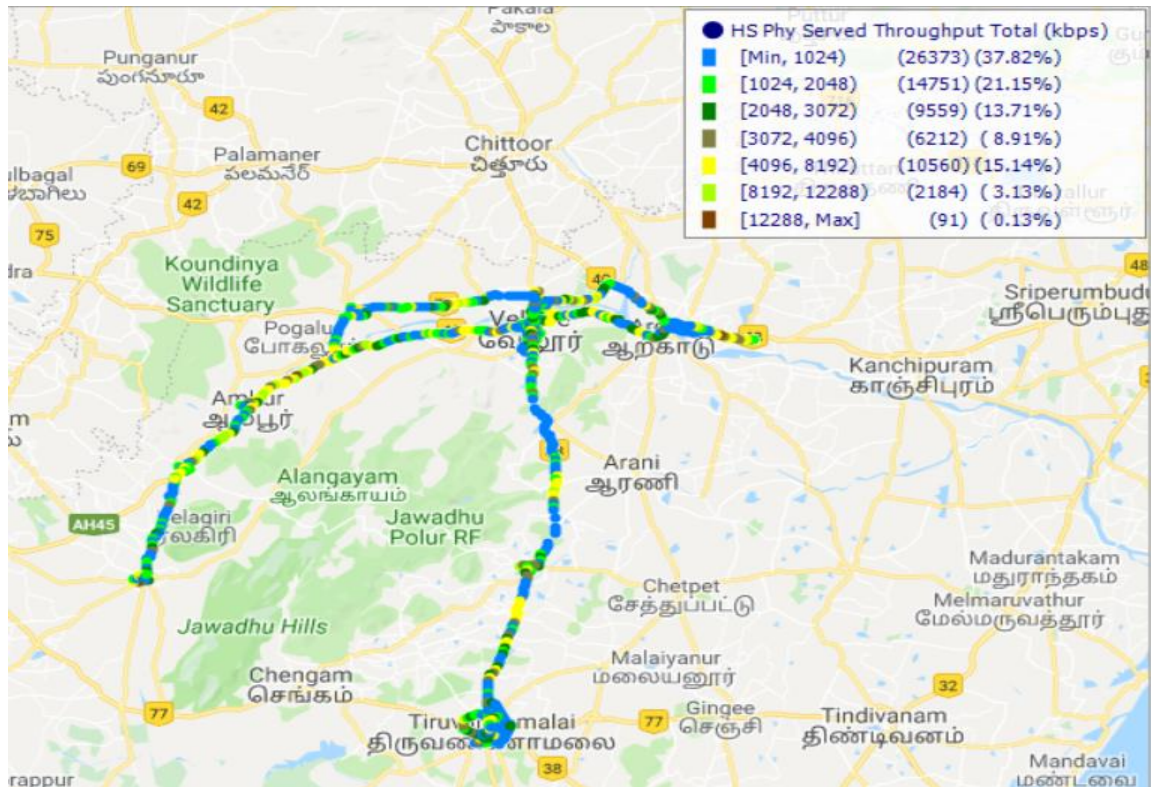
| DL throughput | No of Sample | Percentage(%) |
|---------------|---------------|---------------|
| >12 Mbps | 180056 | 49.83 |
| 8 to 12 Mbps | 50995 | 14.11 |
| 4 to 8 Mbps | 60408 | 16.72 |
| 3 to 4 Mbps | 15460 | 4.28 |
| 2 to 3 Mbps | 13141 | 3.64 |
| 1 to 2 Mbps | 11255 | 2.64 |
| 0 to 1 Mbps | 30012 | 8.26 |
| Total | 361327 | 100 |

IV. Dynamic Data Test- 3G DL Details

BSNL

Data Statistics - Dynamic Complete SSA 450 Kms

| Data KPIs – Overall | 3G |
|----------------------------|------|
| Download Throughput (Mbps) | 2.27 |



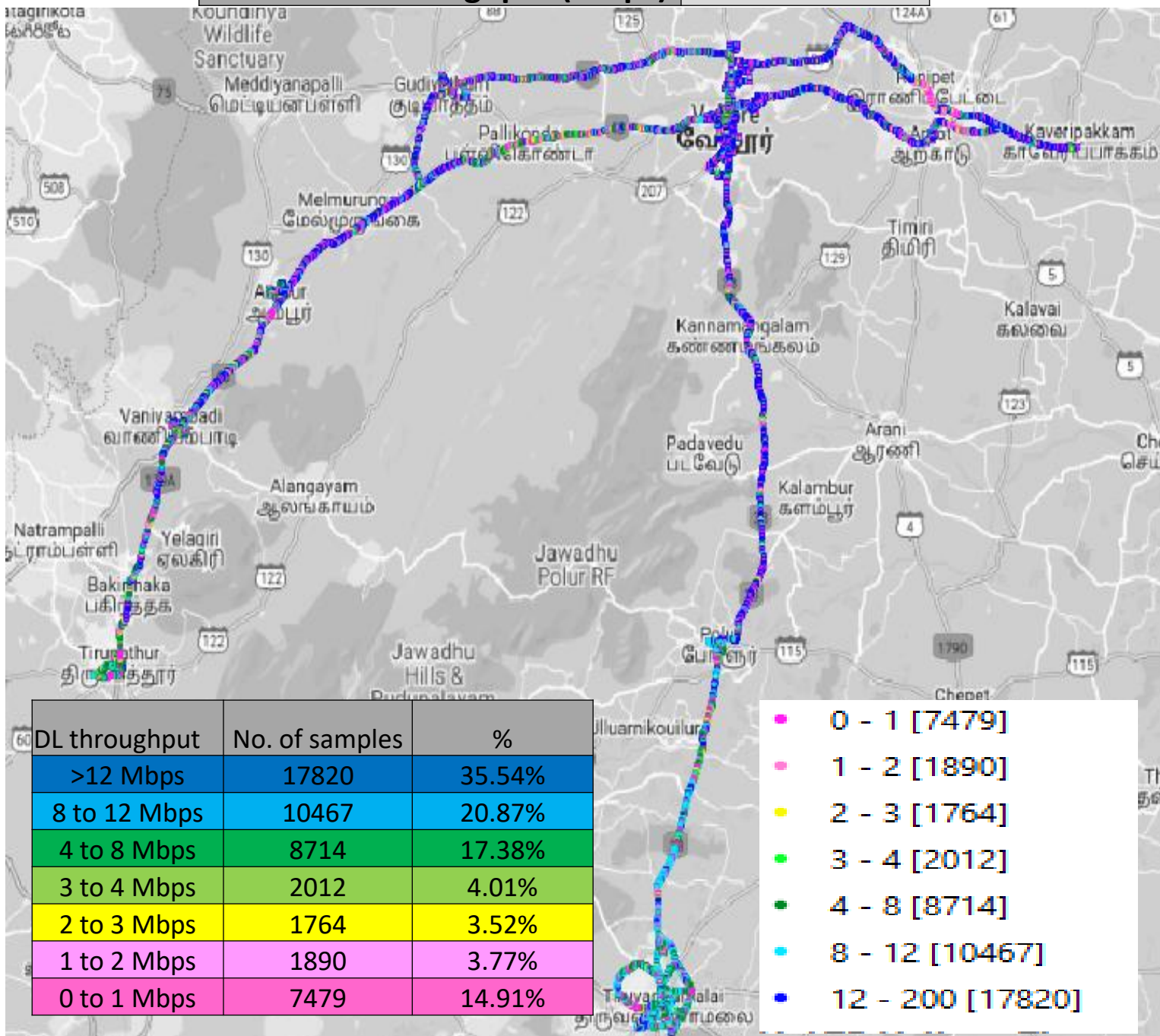
| 3G-DL throughput | No of Sample | % |
|------------------|--------------|-------|
| 0 to 1 Mbps | 26363 | 36.82 |
| 1 to 2 Mbps | 14751 | 21.15 |
| 2 to 3 Mbps | 9559 | 13.71 |
| 3 to 4 Mbps | 6212 | 8.91 |
| 4 to 8 Mbps | 10560 | 15.14 |
| 8 to 12 Mbps | 2184 | 3.14 |
| >12 Mbps | 91 | 0.13 |
| Total | 69730 | 100 |

IV. Dynamic Data Test- 4G DL Details

JIO

Data Statistics - Dynamic Complete SSA - 450 Kms

| Data KPIs - Overall | 4G |
|----------------------------|--------|
| Download Throughput (Mbps) | 13.128 |



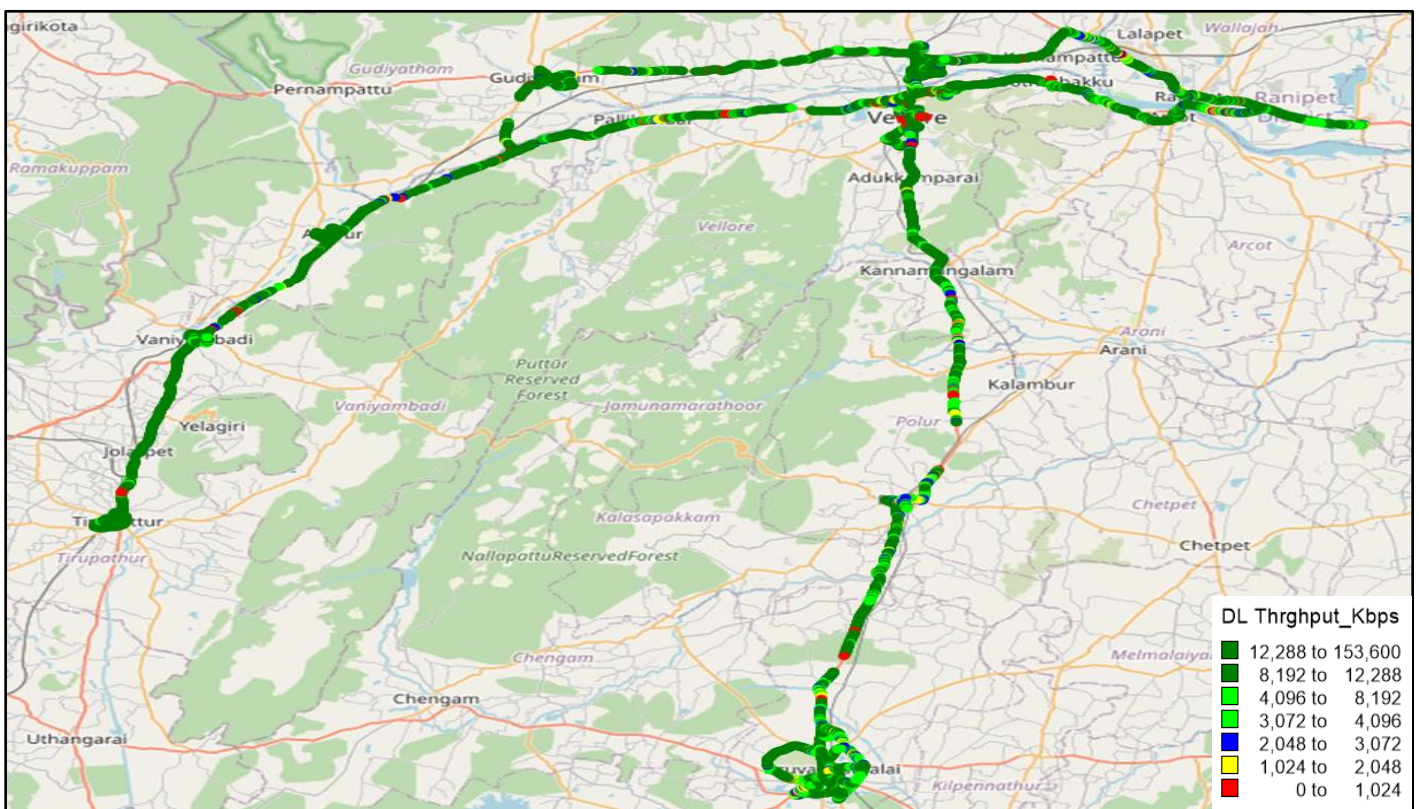
| DL throughput | No. of samples | % |
|---------------|----------------|--------|
| >12 Mbps | 17820 | 35.54% |
| 8 to 12 Mbps | 10467 | 20.87% |
| 4 to 8 Mbps | 8714 | 17.38% |
| 3 to 4 Mbps | 2012 | 4.01% |
| 2 to 3 Mbps | 1764 | 3.52% |
| 1 to 2 Mbps | 1890 | 3.77% |
| 0 to 1 Mbps | 7479 | 14.91% |

IV. Dynamic Data Test- 4G DL Details

VIL

Data Statistics - Dynamic Complete SSA - 450Kms

| | |
|----------------------------|-------|
| Data KPIs – Overall | 4G |
| Download Throughput (Mbps) | 22.21 |



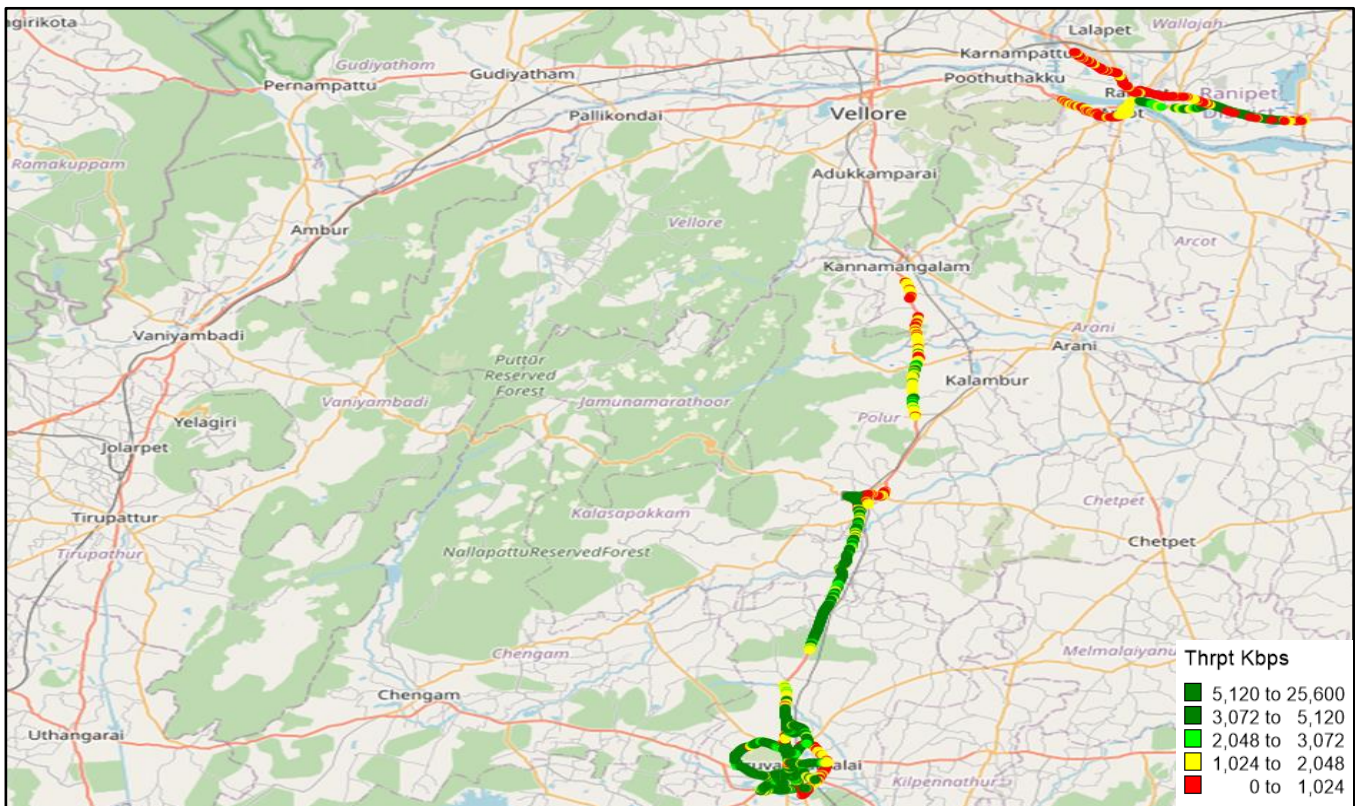
| DL throughput | No of Sample | Percentage(%) |
|---------------|--------------|---------------|
| >12 Mbps | 11053668 | 48.0 |
| 8 to 12 Mbps | 1813634 | 7.9 |
| 4 to 8 Mbps | 5846729 | 25.4 |
| 3 to 4 Mbps | 3167853 | 13.7 |
| 2 to 3 Mbps | 493614 | 2.1 |
| 1 to 2 Mbps | 456788 | 2.0 |
| 0 to 1 Mbps | 219331 | 1.0 |
| Total | 23051717 | 100 |

IV. Dynamic Data Test- 3G DL Details

VIL

Data Statistics - Dynamic Complete SSA - 160Kms

| | |
|----------------------------|------|
| Data KPIs – Overall | 3G |
| Download Throughput (Mbps) | 4.43 |



| DL throughput | No of Sample | Percentage(%) |
|---------------|--------------|---------------|
| > 5 Mbps | 323883 | 49.8 |
| 3 to 5 Mbps | 113804 | 17.5 |
| 2 to 3 Mbps | 54106 | 8.3 |
| 1 to 2 Mbps | 46343 | 7.1 |
| 0 to 1 Mbps | 112412 | 17.3 |
| Total | 650548 | 100 |

V. TRAI MySpeed App

AIRTEL

| Technology- 4G | New Bus Stand- Vellore | Golden Temple- Vellore | Railway Junction- Katpadi | CMC- Vellore | District Collector Office- Thirupathur | Temple- Thiruvanna malai |
|---------------------|------------------------|------------------------|---------------------------|--------------|--|--------------------------|
| Download Speed Mbps | 24.11 | 36.14 | 50.01 | 22.74 | 27.28 | 26.03 |
| Upload Speed Mbps | 30.41 | 3.17 | 29.34 | 11.89 | 6.19 | 26.84 |

BSNL

| Technology- 3G/4G | CMC Hospital, Ranipet | Tirupattur Collectorate , Tirupattur | Arunachala Temple, Tiruvannamalai | Golden Temple, Vellore | KATPADI JN, Vellore | NEW Busstand, Vellore |
|---------------------|-----------------------|--------------------------------------|-----------------------------------|------------------------|---------------------|-----------------------|
| Download Speed Mbps | 1.64 | 2.18 | 2.31 | 7.58 | 1.83 | 1.81 |
| Upload Speed Mbps | 1.32 | 1.56 | 1.69 | 1.70 | 1.77 | 1.03 |

JIO

| Technology 4G | CMC HOSPITAL- RANIPET | THIRUPATHUR COLLECTOR OFFICE | THIRUVANNAMAL AI TEMPLE | GOLDEN TEMPLE- VELLORE | RAILWAY STATION- KATPADI | NEW BUS STAND- VELLORE |
|---------------------|-----------------------|------------------------------|-------------------------|------------------------|--------------------------|------------------------|
| Download Speed Mbps | 31.18 | 48.24 | 58.44 | 28.18 | 55.26 | 28.25 |
| Upload Speed Mbps | 4.81 | 7.67 | 8.87 | 8.52 | 8.75 | 20.24 |

VIL

| Technology- 4G | CMCH Ranipet | Collectrate Tirupattur | Tiruvannamalai Temple | Golden Temple Vellore | Katpadi Railway Stn | New Busstand Vellore |
|---------------------|--------------|------------------------|-----------------------|-----------------------|---------------------|----------------------|
| Download Speed Mbps | 8.19 | 17.42 | 10.06 | 19.0 | 24.06 | 20.91 |
| Upload Speed Mbps | 16.34 | 30.70 | 9.16 | 11.85 | 33.36 | 18.66 |

VI. NH/SH Routes covered

| NH/SH Routes covered in OADT by Airtel / BSNL / RJIL / VIL | | | | |
|--|---------------------------|-----------|-----------|--------------|
| S.No | No of NH/SH routes | NH routes | SH routes | Distance(Km) |
| 1 | Vellore to Ranipet | NH | - | 25 |
| 2 | Vellore to Gudiyatham | - | SH | 33 |
| 3 | Vellore to Tirupattur | NH | SH | 90 |
| 4 | Vellore to Tiruvannamalai | - | SH | 92 |