

प्रभावी विनियमन – सुगम संचार Effective Regulation – Ease of Communication

Operator Assisted Drive Test Report

Ayodhya City and nearby Area 12/02/2023 to 14/02/2023 By TRAI Regional Office Bhopal

The Operator Assisted Drive Test has been carried out by Regional Office, Bhopal with the help of Telecom Service Providers for Ayodhya City and surrounding areas from 9:00 AM to 8:00 PM from -12/02/2024 to 14/02/2024. The drive test covered drive route of around 302 KMs.

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

Key Performance Indicators:

| KPI | Benchmark | Observations |
|-------------------------------|-----------|---|
| Block call rate % | ≤3% | All TSPs achieved the benchmark. |
| Drop call rate % | ≤2% | All TSPs achieved the benchmark. |
| CSSR % | ≥95 % | All TSPs achieved the benchmark. |
| Mobility HOSR % | ≥95% | All TSPs achieved the benchmark. |
| Good BX Quality % | >05% | All TSPs achieved the benchmark, Except |
| Good KA Quality $70 \ge 9570$ | | BSNL in 3G and JIO & Vi in VoLTE. |

Overview

Regional Office, TRAI Bhopal conducted Operator Assisted Drive Test. The performance of Airtel, BSNL, Vodafone Idea and Jio was monitored across various technologies (2G, 3G,4G & 5G). The test results obtained from these drive tests were utilized to assess the network quality for Voice and Data services.

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

Data: Download Throughputs

Drive Test Details : Voice Tests:

- i. 2G measurement UE Locked in 2G
- ii. 3G measurement UE in Dual mode (2G and 3G)
- iii. 4G measurement UE in Free mode

Calls were made for the **120-sec** duration with a wait time of **10 sec** between calls in all technologies.

Data Tests:

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

- i. 3G measurement UE in 3G File Size- 20MB
- ii. 4G measurement UE in LTE File Size- 40MB
- iii. 5G measurement UE in 5G File Size- 200MB

Static Data: Download and Upload Throughputs, Web Browsing Delay, Video Streaming Delay, and Latency

- i. Download- 3G 20 MB, 4G 40MB, 5G -200 MB
- ii. Upload 3G 5 MB, 4G 10MB, 5G 100 MB
- iii. Web browsing 3 links of e-commerce websites <u>https://www.amazon.in</u>, <u>https://www.flipkart.com</u>, <u>https://paytm.com</u>.
- iv. Video Streaming 130 sec clip
- v. Latency 32 Bytes on <u>www.google.com</u>.

Overview

Voice & Dynamic Data Test Drive Route



List of important area covered during the drive test

Fzizabad civilline ,cant,faizabad bus stand ,faizabad cant reailway station,chowk ,fateganj devkali by pass

,Sultanpur by pass,raibareli by pass,airport,Both no 4,Ayodhya dham bus stand ,Ayodhya dham reailway

Station,sury ghat dharam path ,ram path,latamagheshkaer choek,ram ki paidi,Ram ghupha,dev kali,

Darshan nager, Dershan nager railway station, 14 kosi parikarma mag,

Overview

Data Service Test- Static Locations



Ram Janm Bhoomi Mandir Ayodhya Bus stand Ayodhya Railway Station

Faizabad Railway Station

Ayodhya Airport

Hotspot Locations

Ram Janmbhumi mandir

Ayodhya Bus stand

Ayodhya Railway station

Ayodhya Airport

Saryu ghat

Faizabad railway station

Voice Calls

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





| KPIs | 2G | | 3G | | VoLTE | | | |
|-------------------|--------|------|------|------|-------|--------|------|-----|
| | Airtel | BSNL | VIL | BSNL | VIL | Airtel | RJIL | VIL |
| Drop Call Rate % | 0.00 | 0.02 | 0 | 1.45 | NA | 0.34 | 0 | 0 |
| Block Call Rate % | 0.00 | 0 | 0.83 | 1.79 | NA | 0.00 | 0 | 0 |

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

Voice Calls

Key Observations

Coverage

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

| | 2G | | | |
|------------|--------|-------|-------|--|
| TSPs | Airtel | BSNL | VIL | |
| Coverage % | 91.63 | 89.66 | 96.36 | |

b) Percentage of coverage samples for $3G \ge -90$ dBm

| TODa | 3G |
|------------|-------|
| ISPS | BSNL |
| Coverage % | 74.43 |

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

| TSDa | VoLTE | | | |
|------------|--------|-------|-------|--|
| 1055 | Airtel | JIO | VIL | |
| Coverage % | 99.91 | 99.96 | 99.28 | |

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

| | 3G | | VoLTE | | |
|-----------------------|------|-----|--------|-----|-----|
| TSPs | BSNL | VIL | Airtel | VIL | JIO |
| Time Spent on 3G/4G % | 86.6 | NA | 100 | 100 | 100 |

Key Observations

Data Services Dynamic

Dynamic Data -Download Throughput was tested.

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



| TSP | Airtel | BSNL | JIO | VIL |
|--|--------|-------|-------|-------|
| Average Download throughput- 3G In Mbps | NA | 2.098 | NA | NA |
| Average Download throughput-LTE in Mbps | 36.67 | NA | 17.04 | 22.03 |
| Average Download throughput- 5G in Mbps | NA | NA | NA | NA |

Summary

City Level Summary- Voice

| TSP (For 2G) | Airtel | BSNL | VIL |
|-------------------|--------|-------|-------|
| Call attempts | 287 | 429 | 240 |
| Block call rate % | 0.00 | 0 | 0.83 |
| CSSR % | 100 | 100 | 99.17 |
| Drop call rate % | 0.00 | .02 | 0 |
| Mobility HOSR % | 99.98 | 97.4 | 96.3 |
| RX Quality % | 98.31 | 95.72 | 96.76 |
| Average CST Sec | 4 | 3.8 | 3.37 |

| TSP (For 3G) | BSNL |
|-------------------|-------|
| Call attempts | 837 |
| Block call rate % | 1.79 |
| CSSR % | 98.21 |
| Drop call rate % | 1.45 |
| Mobility HOSR % | 100 |
| RX Quality % | 85.58 |
| Average CST (Sec) | 3.6 |

| TSP (For Volte) | Airtel | BSNL | JIO | VIL |
|---------------------|--------|------|-------|-------|
| Call attempts | 287 | NA | 302 | 239 |
| Block call rate % | 0.00 | NA | O | 0 |
| CSSR % | 99.65 | NA | 100 | 100 |
| Drop call rate % | 0.34 | NA | 0 | 0 |
| Mobility HOSR % | 98.62 | NA | 99.93 | 98.6 |
| RX Quality % | 97.27 | NA | 90.97 | 92.90 |
| Average CST(Sec) | 2 | NA | 0.91 | 0.64 |

| TSP (For 3G) | BSNL |
|------------------------------|-------|
| Download throughput in Mbps | 6.69 |
| Upload Throughput in Mbps | 2.018 |
| Video streaming delay in sec | 6.4 |
| Web browsing delay in second | 6.7 |
| Latency in (msec) | 97 |
| | |

| TSP (For LTE) | Airtel | BSNL | JIO | VIL |
|----------------------|--------|------|-------|-------|
| Download throughput | 26.02 | | 21 02 | 22 51 |
| in Mbps | 30.02 | NA | 51.05 | 23.51 |
| Upload Throughput in | 15 90 | | 17 01 | 14.02 |
| Mbps | 15.69 | NA | 17.01 | 14.03 |
| Video streaming | 0.27 | | 0.05 | 2 059 |
| delay in sec | 0.37 | NA | 0.95 | 2.050 |
| Web browsing delay | 0.07 | | 4 75 | 4.04 |
| in second | 0.27 | NA | 1.75 | 4.91 |
| Latency in (msec) | 53.93 | NA | 45 | 43.5 |

| TSP (For 5G) | Airtel | BSNL | JIO | VIL |
|--------------------------------|--------|------|-----|-----|
| Download throughput in Mbps | 160.89 | NA | NA | NA |
| Upload Throughput in Mbps | 53.06 | NA | NA | NA |
| Video streaming delay in sec | 0.16 | NA | NA | NA |
| Web browsing delay in second | 0.09 | NA | NA | NA |
| Latency in (msec) | 55.06 | NA | NA | NA |

Data Services Static

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











3G/4G/ 5G Network

1. Hotspot Location- Ram Janmbhumi Mandir

| | 3G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | NA | 8.76 | NA | NA |
| Mbps | | | | |
| Upload Throughput in | NA | 2.24 | NA | NA |
| Mbps | | | | |
| Video streaming delay in | NA | 5.9 | NA | NA |
| sec | | | | |
| Web browsing delay in | NA | 5.6 | NA | NA |
| second | | | | |
| Latency in (msec) | NA | 63.8 | NA | NA |

| | LTE | | | |
|--------------------------|--------|-------|-------|---------|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 44.00 | ΝΙΔ | 35.58 | 20.20 |
| Mbps | 44.99 | INA | | 28.29 |
| Upload Throughput in | 16 65 | ΝΙΔ | 16.72 | 21 1 2 |
| Mbps | 10.05 | INA | | 21.12 |
| Video streaming delay in | 0.21 | NΙΛ | 0.6 | 1 1 6 / |
| sec | 0.31 | INA I | | 1.104 |
| Web browsing delay in | 0.16 | ΝΙΔ | 1.32 | ГОС |
| second | 0.16 | | | 5.80 |
| Latency in (msec) | 38 | NA | 44 | 53 |

| | 5G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 150 | ΝΙΔ | | ΝΙΛ |
| Mbps | 100 | INA | | INA |
| Upload Throughput in | 15 65 | NIΛ | | ΝΙΛ |
| Mbps | 15.65 | INA | | INA |
| Video streaming delay in | 0.20 | NΛ | | ΝΛ |
| sec | 0.29 | | | |
| Web browsing delay in | 0.05 | ΝΙΔ | | ΝΙΛ |
| second | 0.05 | INA | | INA |
| Latency in (msec) | 34.3 | NA | NA | NA |

2. Hotspot Location- Ayodhya Bus stand

| • | 3G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | NA | 9.92 | NA | NA |
| Mbps | | | | |
| Upload Throughput in | NA | 2.40 | NA | NA |
| Mbps | | | | |
| Video streaming delay in | NA | 6.8 | NA | NA |
| sec | | | | |
| Web browsing delay in | NA | 6.1 | NA | NA |
| second | | | | |
| Latency in (msec) | NA | 97.8 | NA | NA |

| | LTE | | | |
|--------------------------|--------|------|-----|-------|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 28 5 | ΝΔ | ΝΙΛ | 11.26 |
| Mbps | 20.5 | ΝA | | 11.50 |
| Upload Throughput in | 20.68 | NΙΛ | ΝΙΛ | 7.40 |
| Mbps | 20.00 | NA | | 7.49 |
| Video streaming delay in | 0.46 | ΝΔ | ΝΛ | 1 260 |
| sec | 0.40 | | | 1.309 |
| Web browsing delay in | 0.20 | ΝΑ | ΝΙΛ | 110 |
| second | 0.30 | | | 4.10 |
| Latency in (msec) | 50 | NA | NA | 39 |

| | 5G | | | |
|------------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in Mbps | 140.78 | NA | NA | NA |
| Upload Throughput in Mbps | 25.47 | NA | NA | NA |
| Video streaming delay in sec | 0.30 | NA | NA | NA |
| Web browsing delay in second | 0.12 | NA | NA | NA |
| Latency in (msec) | 42.6 | NA | NA | NA |
| Summary | | | | |

3. Hotspot Location- Ayodhya Railway station

| | 3G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | NA | 6.15 | NA | NA |
| Mbps | | | | |
| Upload Throughput in | NA | 2.22 | NA | NA |
| Mbps | | | | |
| Video streaming delay in | NA | 7 | NA | NA |
| sec | | | | |
| Web browsing delay in | NA | 6.5 | NA | NA |
| second | | | | |
| Latency in (msec) | NA | 104 | NA | NA |

| | LTE | | | |
|--------------------------|--------|------|-------|-------|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 22 50 | ΝΑ | 20.00 | 22 45 |
| Mbps | 23.59 | NA | 29.00 | 55.45 |
| Upload Throughput in | 10.70 | ΝΑ | 12 10 | |
| Mbps | 10.79 | NA | 13.40 | 25.2 |
| Video streaming delay in | 0.54 | NΛ | 2.1 | 1 674 |
| sec | 0.54 | | 2.1 | 1.074 |
| Web browsing delay in | 0.20 | ΝΙΔ | 1 50 | 1 70 |
| second | 0.28 | INA | 1.59 | 4./ð |
| Latency in (msec) | 35 | NA | 43 | 48 |

| | 5G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 150.22 | ΝΑ | ΝΙΛ | ΝΙΔ |
| Mbps | 150.55 | INA | | |
| Upload Throughput in | 52 40 | ΝΙΔ | | ΝΙΔ |
| Mbps | 55.40 | INA | | INA |
| Video streaming delay in | 0.10 | NΙΛ | ΝΙΛ | ΝΑ |
| sec | 0.10 | | | |
| Web browsing delay in | 0.06 | ΝΙΔ | | ΝΙΔ |
| second | 0.06 | INA | | INA |
| Latency in (msec) | 68.1 | NA | NA | NA |

Data Services Static

City Level Summary

4. Hotspot Location- Ayodhya Airport

| | 3G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | NA | 8.88 | NA | NA |
| Mbps | | | | |
| Upload Throughput in | NA | 2.20 | NA | NA |
| Mbps | | | | |
| Video streaming delay in | NA | 6.8 | NA | NA |
| sec | | | | |
| Web browsing delay in | NA | 6.1 | NA | NA |
| second | | | | |
| Latency in (msec) | NA | 98.8 | NA | NA |

| | LTE | | | |
|--------------------------|--------|------|-------|---------|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 28.04 | ΝΔ | 11 20 | 27.26 |
| Mbps | 20.04 | INA | 44.30 | 27.50 |
| Upload Throughput in | 3.05 | ΝΔ | 10.62 | 7 06 |
| Mbps | 3.95 | IN/A | 19.02 | 7.00 |
| Video streaming delay in | 0.40 | ΝΔ | 1.2 | 0 1 5 1 |
| sec | 0.40 | NA | 1.2 | 0.151 |
| Web browsing delay in | 0.30 | ΝΔ | 265 | 1 01 |
| second | 0.30 | | 2.00 | 4.91 |
| Latency in (msec) | 79.6 | NA | 48 | 34 |

| | 5G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 222.07 | ΝΑ | ΝΙΛ | ΝΙΛ |
| Mbps | 223.07 | INA | | INA |
| Upload Throughput in | 67 74 | ΝΙΔ | | ΝΙΛ |
| Mbps | 07.74 | INA | | INA |
| Video streaming delay in | 0.16 | NΙΔ | | ΝΙΛ |
| sec | 0.10 | | | |
| Web browsing delay in | 0.12 | NIA | | ΝΙΔ |
| second | 0.15 | INA | | INA |
| Latency in (msec) | 20 | NA | NA | NA |

5. Hotspot Location- Saryu ghat

| | 3G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | NA | 7.97 | NA | NA |
| Mbps | | | | |
| Upload Throughput in | NA | 2.23 | NA | NA |
| Mbps | | | | |
| Video streaming delay in | NA | 6.3 | NA | NA |
| sec | | | | |
| Web browsing delay in | NA | 5.9 | NA | NA |
| second | | | | |
| Latency in (msec) | NA | 66.7 | NA | NA |

| | LTE | | | |
|--------------------------|--------|------|-------|------|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 60 | ΝΙΔ | 24.32 | 15 1 |
| Mbps | 09 | | | 15.1 |
| Upload Throughput in | 17.26 | ΝΙΔ | 14.5 | 2 74 |
| Mbps | 17.50 | | | 2.74 |
| Video streaming delay in | 0.25 | ΝΙΛ | 0.6 | E 22 |
| sec | 0.25 | | | 5.52 |
| Web browsing delay in | 0.22 | | 1.45 | F 40 |
| second | 0.23 | | | 5.48 |
| Latency in (msec) | 46 | NA | 47 | 49 |

| | 5G | | | |
|--------------------------|--------|------|------|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 149.04 | ΝΙΔ | ΝΙΛ | ΝΙΔ |
| Mbps | 140.94 | NA | INA | INA |
| Upload Throughput in | 77 20 | ΝΙΔ | ΝΙΛ | ΝΙΔ |
| Mbps | 11.30 | NA | INA | INA |
| Video streaming delay in | 0.04 | NΙΔ | ΝΙΛ | ΝΙΔ |
| sec | 0.04 | | IN/A | |
| Web browsing delay in | 0.04 | ΝΙΔ | ΝΙΛ | ΝΙΔ |
| second | 0.04 | INA | INA | INA |
| Latency in (msec) | 56.2 | NA | NA | NA |

Data Services Static

City Level Summary

6. Hotspot Location- Faizabad railway station

| | 3G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | NA | 5.95 | NA | NA |
| Mbps | | | | |
| Upload Throughput in | NA | 1.77 | NA | NA |
| Mbps | | | | |
| Video streaming delay in | NA | 6.2 | NA | NA |
| sec | | | | |
| Web browsing delay in | NA | 6.1 | NA | NA |
| second | | | | |
| Latency in (msec) | NA | 110 | NA | NA |

| | Airtel | BSNL | JIO | VIL |
|--------------------------|--------|------|-------|-------|
| Download throughput in | 26.92 | ΝΙΔ | 30.37 | |
| Mbps | 20.03 | NA | | 25.52 |
| Upload Throughput in | 26.27 | ΝΙΛ | 26.71 | 21 70 |
| Mbps | 20.27 | INA | | 21.79 |
| Video streaming delay in | 0.30 | ΝΙΛ | 0.6 | 267 |
| sec | 0.39 | INA | | 2.07 |
| Web browsing delay in | 0.40 | ΝIΛ | 1.56 | 4 7 4 |
| second | 0.40 | | | 4.24 |
| Latency in (msec) | 75 | NA | 43 | 38 |

| | 5G | | | |
|--------------------------|--------|------|-----|-----|
| | Airtel | BSNL | JIO | VIL |
| Download throughput in | 111 28 | ΝΔ | ΝΙΛ | ΝΙΔ |
| Mbps | 144.50 | ΝA | | |
| Upload Throughput in | 70 12 | ΝΙΔ | ΝΙΛ | ΝΙΔ |
| Mbps | 79.13 | NA | | INA |
| Video streaming delay in | 0.00 | ΝΑ | ΝΙΛ | ΝΙΔ |
| sec | 0.08 | NA | | INA |
| Web browsing delay in | 0.04 | | NIA | ΝΙΔ |
| second | 0.04 | INA | | INA |
| Latency in (msec) | 59.5 | NA | NA | NA |

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

| TSP | Coverage Rate % |
|--------------|------------------------|
| Airtel 2G | 91.63 |
| BSNI 2G | 89.66 |
| VIL 2G | 96.36 |
| BSNL 3G | 74.43 |
| Airtel VoLTE | 99.91 |
| Jio VoLTE | 99.96 |
| VIL VoLTE | 99.28 |





TSP BSNL



| | 2G | | | |
|-----------------|-----------|-------|---------|--|
| Overall RxLevel | # Samples | % PDF | Legends | |
| [Max, >=-75] | 14195 | 62.54 | | |
| [-75, >=-85) | 6154 | 27.12 | | |
| [-85, >=-95) | 2129 | 9.38 | | |
| [-95, >=Min) | 218 | 0.96 | | |
| Total | 22696 | 100 | | |

TSP-VIL

| Technology | Coverage % |
|------------|------------|
| 2G | 96.36% |



| | 2G | | | | |
|-----------------|-----------|--------|---------|--|--|
| Overall RxLevel | # Samples | % PDF | Legends | | |
| [Max, >=-75] | 10349 | 75.53% | | | |
| [-75, >=-85) | 2854 | 20.83% | | | |
| [-85, >=-95) | 480 | 3.50% | | | |
| [-95, >=Min) | 19 | 0.14% | | | |
| Total | 13702 | 100% | | | |

TSP BSNL



| | 3G | | |
|--------------|-----------|-------|---------|
| Overall RSCP | # Samples | % PDF | Legends |
| [Max, >=-70] | 13465 | 29.39 | |
| [-70, >=-80) | 13054 | 28.50 | |
| [-80, >=-90) | 12157 | 26.54 | |
| [-90, >=Min) | 7130 | 15.57 | |
| Total | | | |

TSP-AIRTEL



| VoLTE | | | | |
|---------------|-----------|-------|---------|--|
| Overall RSRP | # Samples | % PDF | Legends | |
| [Max, >=-80] | 1722986 | 65.40 | | |
| [-80, >=-90) | 837593 | 31.99 | | |
| [-90, >=-110) | 65786 | 2.51 | | |
| [-110, >=Min) | 2178 | 0.08 | | |
| Total | | | | |



| | VoLTE | | | | |
|---------------|-----------|--------|---------|--|--|
| Overall RSRP | # Samples | % PDF | Legends | | |
| [Max, >=-80] | 17731 | 60.44% | | | |
| [-80, >=-90) | 7923 | 27.01% | | | |
| [-90, >=-110) | 3668 | 12.50% | | | |
| [-110,>=>140) | 10 | 0.05% | | | |
| Total | 29332 | | | | |

TSP- VIL

| Technology | Coverage % |
|------------|------------|
| VoLTE | 99.28% |



| | VoLTE | | | | |
|---------------|-----------|--------|---------|--|--|
| Overall RSRP | # Samples | % PDF | Legends | | |
| [Max, >=-80] | 6267 | 20.33% | | | |
| [-80, >=-90) | 10642 | 34.52% | | | |
| [-90, >=-110) | 13695 | 44.43% | | | |
| [-110, >=Min) | 223 | 0.72% | | | |
| Total | 30827 | 100% | | | |

| TSP | Rx Quality % |
|----------------|--------------|
| Airtel 2G | 98.31 |
| BSNI 2G | 95.72 |
| VIL 2G | 96.76 |
| BSNL 3G | 85.58 |
| Airtel VoLTE | 97.24 |
| Jio VoLTE | 91 |
| VIL VoLTE | 92.9 |



TSP-AIRTEL.



| Overall Rx Quality | # Samples | % PDF | Legends |
|--------------------|-----------|-------|---------|
| (Min, <=2) | 2169192 | 90.85 | |
| (2, <=3) | 66908 | 2.80 | |
| (3 , <=4) | 68862 | 2.88 | |
| (4 , <=5) | 42506 | 1.78 | |
| (5 , <=Max) | 40406 | 1.69 | |
| Total | | | |



| Overall Rx Quality | # Samples | % PDF | Legends |
|--------------------|-----------|-------|---------|
| (Min, <=2) | 44646 | 89.07 | |
| (2, <=3) | 1121 | 2.24 | |
| (3 , <=4) | 1239 | 2.47 | |
| (4 , <=5) | 974 | 1.94 | |
| (5 , <=Max) | 2144 | 4.28 | |
| Total | 50124 | 100 | |

TSP-VIL

| Technology | Rx Quality % |
|------------|--------------|
| 2G | 96.76% |



| Overall Rx Quality | # Samples | % PDF | Legends |
|--------------------|-----------|--------|---------|
| (Min, <=2) | 10201 | 82.31% | |
| (2, <=3) | 769 | 6.20% | |
| (3 , <=4) | 681 | 5.49% | |
| (4 , <=5) | 342 | 2.76% | |
| (5 , <=Max) | 401 | 3.24% | |
| Total | 12394 | 100% | |

| Overall Ec/No | # Samples | % PDF | Legends |
|---------------|-----------|-------|---------|
| (Max, <=-6) | 12356 | 33.48 | |
| (-6, <=-9) | 9396 | 25.46 | |
| (-9, <=-11) | 558 | 1.51 | |
| (-11, <=-14) | 9272 | 25.13 | |
| (-14, <= Min) | 5319 | 14.41 | |
| Total | | | |

TSP-AIRTEL.

| Technolo | ogy | Rx C | Quality % | |
|--------------|-------|-------|-----------|---------|
| VoLTI | E | 9 | 97.24 | |
| | | | | |
| Overall SINR | # San | nples | % PDF | Legends |
| (Min, <=0) | 700 |)93 | 2.76 | |
| (0, <=5) | 6824 | 463 | 26.90 | |
| (5, <=10) | 531 | 788 | 20.96 | |
| (10, <=15) | 322 | 910 | 12.73 | |
| (15, <=Max) | 930 | 063 | 36.66 | |
| Total | | | | |

| Overall SINR | # Samples | % PDF | Legends |
|---------------------|-----------|-------|---------|
| (Min, <=0) | 2649 | 9.0% | |
| (0, <=5) | 6508 | 22.2% | |
| (5, <=10) | 7392 | 25.2% | |
| (10, <=15) | 6130 | 20.9% | |
| (15, <=Max) | 6653 | 22.7% | |
| Total | 29332 | | |

TSP - JIO

| | TSP | - VIL | | |
|----------------------|-------------|---------------------|-----------------------|---------|
| Techno VoL | ology TE | Rx Qualit 92.90% | у % <mark>6</mark> | |
| | | | | |
| Overall SINR | # Sam | nples % | PDF | Legends |
| (Min, <=0) | 218 | 34 7 | '.10% | |
| (0, <=5) | 874 | 10 28 | 8.42% | |
| (5, <=10) | 93(|)7 3(| 0.26% | |
| (10, <=15) | 621 | 4 20 | 0.21% | |

(15, <=Max)

Total

4307

30752

14.01%

100%

| TSP | % of Time Spent on 3G/VoLTE |
|--------------|-----------------------------|
| BSNL 3G | 86.6 |
| Airtel VoLTE | 100 |
| Jio VoLTE | 100 |
| VIL VoLTE | 100 |

TSP-AIRTEL.

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

TSP-BSNL

| Technology | % of Time Spent on |
|------------|--------------------|
| 3G | 86.6 |
| VoLTE | |

TSP-BSNL

| Data KPIs - Overall | 3G |
|----------------------------|-------|
| Download Throughput (Mbps) | 2.098 |

| DL throughput | No of Sample | % | Legends |
|---------------|--------------|-------|---------|
| < 1 Mbps | 152 | 5.30 | |
| 1-5 Mbps | 1413 | 49.23 | |
| 5-10 Mbps | 1033 | 35.99 | |
| >10Mbps | 272 | 9.48 | |

TSP-AIRTEL

| Data KPIs - Overall | LTE |
|----------------------------|-------|
| Download Throughput (Mbps) | 36.67 |

| DL throughput | No of Sample | % | Legends |
|---------------|--------------|-------|---------|
| < 2Mbps | 177139 | 2.07 | |
| 2-5 Mbps | 108767 | 1.27 | |
| 5-10 Mbps | 420260 | 4.92 | |
| >10Mbps | 7822921 | 91.72 | |

Dynamic Data Test

TSP - JIO

| DL throughput | No of Sample | % | Legends |
|---------------|--------------|-------|---------|
| < 2Mbps | 4596 | 12.4% | |
| 2-5 Mbps | 7442 | 20.1% | |
| 5-10 Mbps | 5101 | 13.8% | |
| >10Mbps | 19907 | 53.7% | |

TSP- VIL

| Data KPIs - Overall | LTE |
|----------------------------|-------|
| Download Throughput (Mbps) | 22.03 |

| DL throughput | No of Sample | % | Legends |
|---------------|--------------|--------|---------|
| < 2Mbps | 1282 | 8.55% | |
| 2-5 Mbps | 683 | 4.55% | |
| 5-10 Mbps | 1964 | 13.10% | |
| >10Mbps | 11068 | 73.80% | |