



Independent Quality of Service Survey in Pakistan – Cities

Third Quarter 2024

Enforcement Division
PTA | F-5/1, Islamabad

Executive Summary

1. QUALITY OF SERVICE SURVEY

Pakistan Telecommunication Authority (PTA) has carried out independent Quality of Service (QoS) Survey in 18x cities of Pakistan during 3rd Quarter 2024. During the survey, the performance of Cellular Mobile Operators (CMOs) has been assessed in accordance with the Cellular Mobile Network QoS Regulations 2021.

The survey comprised of 0.29 million tests to measure Mobile Broadband Performance while 41700 samples of Voice and SMS were tested. Summary of the drive and overall results are as below:



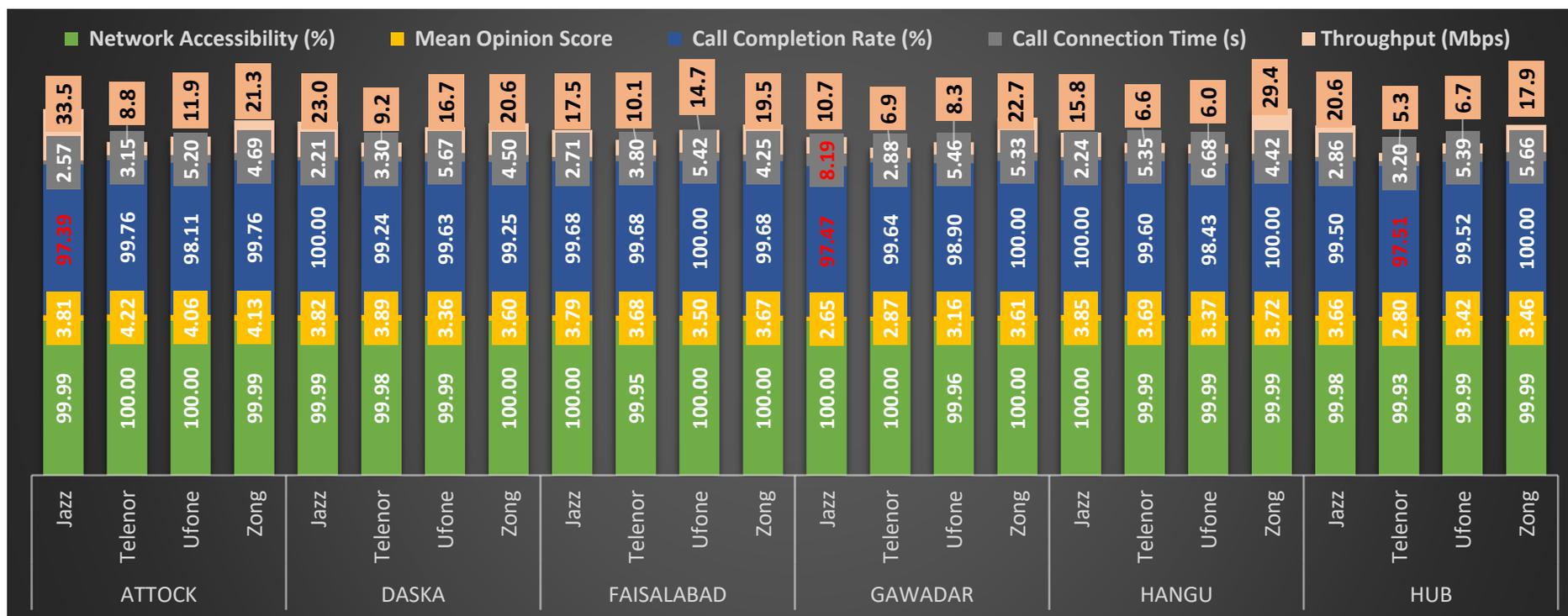
2400 KMs
Travelled



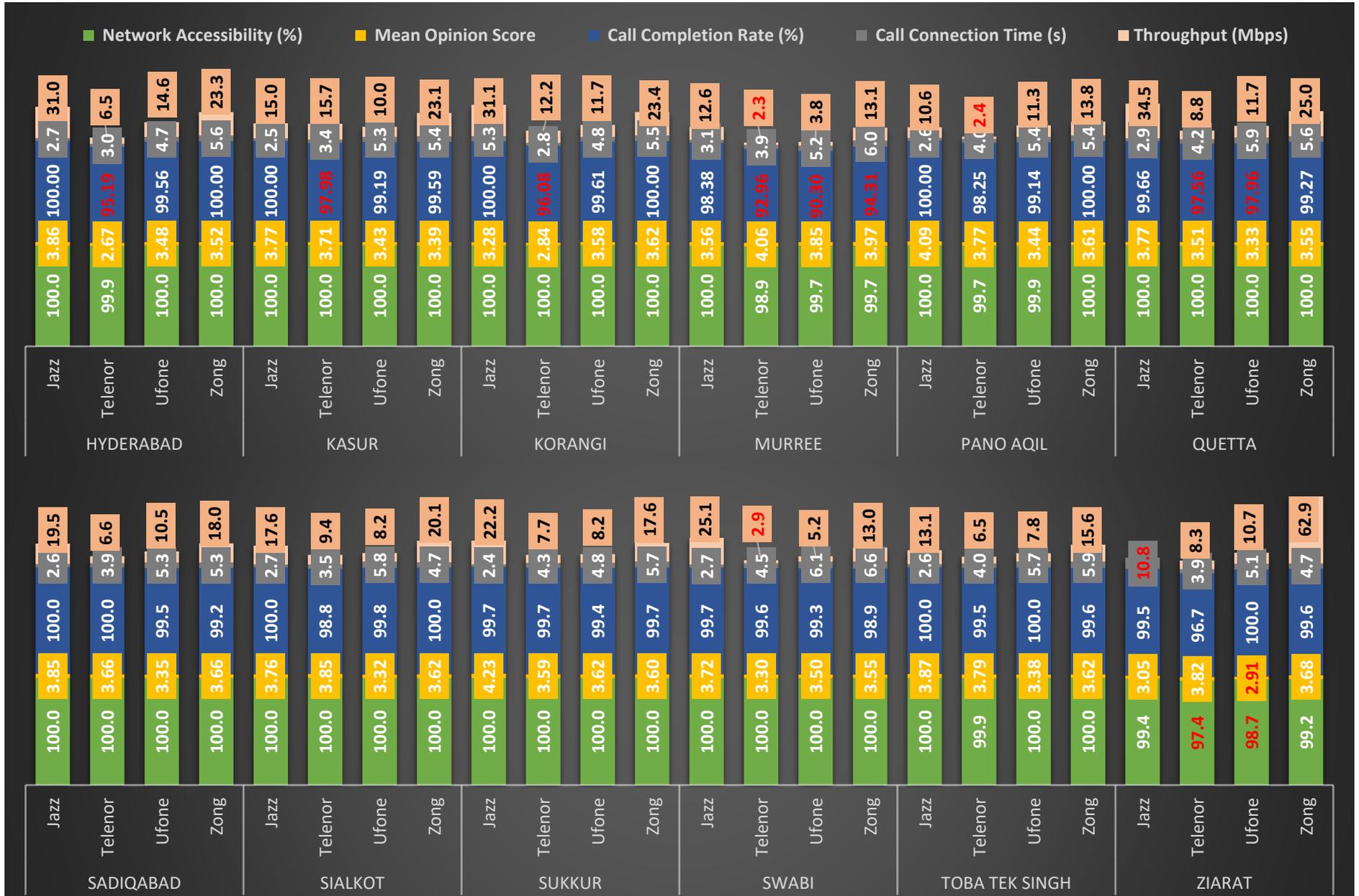
63 Days
Survey



18 Cities
Tested

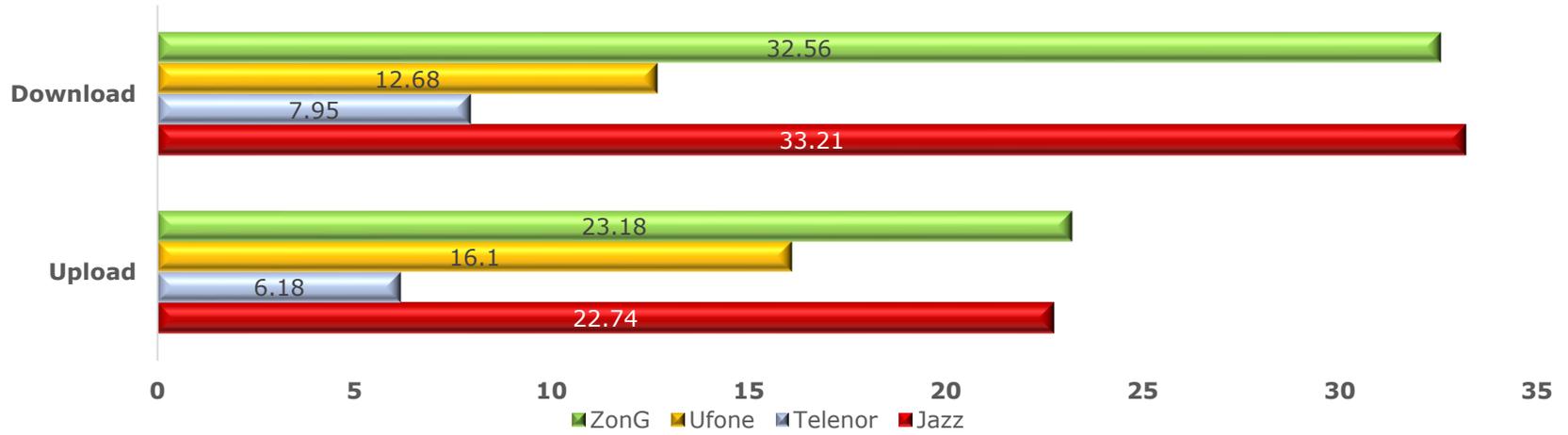


Non-compliant KPIs are highlighted in **Red**

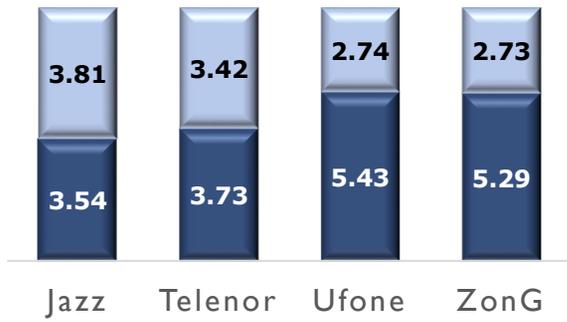


Non-compliant KPIs are highlighted in Red

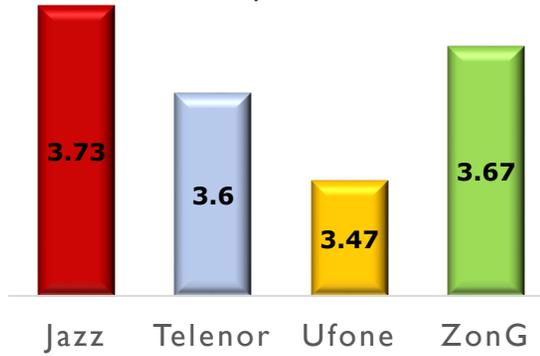
Data Throughput (Mbps)



Call Connection Time / SMS Send Time



Mean Opinion Score



Network Latency



2. RANKING

Based upon the compliance level of each KPI in surveyed cities against threshold defined in QoS Regulations, CMOs have been ranked between 1st to 4th position in Mobile Network Coverage, Mobile Broadband, Voice and SMS Services as shown below:

| Cellular Mobile Operator | Coverage  | Mobile Broadband | | | | | | Voice  | SMS  | |
|---|---|---|---|---|--|--|---------------------------|--|--|---|
| | | Throughput  | | | | Latency  | | | | Browsing  |
| | | Auto Mode | | 3 rd Party App | | Auto Mode | 3 rd Party App | | | Auto Mode |
| | |  |  |  |  | | | | | |
|  | 2 nd | 2 nd | 2 nd | 1 st | 2 nd | 3 rd | 2 nd | 3 rd | 2 nd | 3 rd |
|  | 1 st | 1 st | 1 st | 2 nd | 1 st | 1 st | 1 st | 1 st | 1 st | 1 st |
|  | 3 rd | 3 rd | 3 rd | 3 rd | 3 rd | 2 nd | 1 st | 2 nd | 3 rd | 2 nd |
|  | 4 th | 4 th | 4 th | 4 th | 4 th | 1 st | 3 rd | 1 st | 4 th | 4 th |

Quality of Service Survey

1. KEY PERFORMANCE INDICATORS (KPIs)

All CMOs are required to meet or exceed the benchmark of QoS KPIs as provided as per Cellular Mobile Network Quality of Service (QoS) Regulations 2021. To ensure accurate benchmarking, PTA is collecting and analyzing a statistically significant sample of minimum 200 calls and data sessions, enabling the evaluation of critical performance parameters.

2. SURVEY CITIES

Quality of Service Survey was conducted in 18x cities of Khyber Pakhtunkhwa, Punjab, Sindh and Balochistan during July and August 2024. Survey routes were selected in a manner to cover the maximum population area of the respective surveyed cities. The names of cities along with survey dates are mentioned in Table 1.1: QoS Survey Cities & Dates:

| S. #. | City | Province | Days | Survey Dates |
|-------|----------------|--------------------|------|---|
| 1 | Swabi | Khyber Pakhtunkhwa | 4 | 22 nd to 25 th July |
| 2 | Hangu | | 3 | 6 th to 8 th Aug |
| 3 | Murree | Punjab | 3 | 29 th to 31 st July |
| 4 | Attock | | 4 | 22 nd to 25 th July |
| 5 | Kasur | | 3 | 29 th to 31 st July |
| 6 | Sialkot | | 4 | 22 nd to 25 th July |
| 7 | Sadiqabad | | 4 | 22 nd to 25 th July |
| 8 | Toba Tek Singh | | 3 | 30 th July to 1 st Aug |
| 9 | Faisalabad | | 4 | 5 th , 6 th , 12 th , 13 th Aug |
| 10 | Daska | | 3 | 19 th to 21 st Aug |
| 11 | Gawadar | Balochistan | 3 | 8 th to 10 th July |
| 12 | Ziarat | | 3 | 29 th to 31 st July |
| 13 | Quetta | | 4 | 22 nd to 25 th July |
| 14 | Hub | | 4 | 30 th July to 2 nd Aug |
| 15 | Hyderabad | Sindh | 3 | 6 th to 8 th Aug |
| 16 | Korangi | | 4 | 23 rd to 26 th July |
| 17 | Pano Agil | | 3 | 29 th to 31 st July |
| 18 | Sukkur | | 4 | 22 nd to 25 th July |

Table 1.1: QoS Survey Dates and Samples

3. TEST STATISTICS

During the survey, Quality of Services tests were conducted in the areas of Voice, Mobile Broadband (Throughput, Latency and Web Browsing) and Short Messaging Service (SMS). Service-wise tests conducted for each CMO are shown in Table 2.1: Test Statistics.

| Service | Jazz | ZonG | Telenor | Ufone |
|--|-------|-------|---------|-------|
| Automode (Throughput and Latency) | 23861 | 23528 | 23563 | 23623 |
| 3 rd Party App (Throughput and Latency) | 33456 | 33390 | 33453 | 33324 |
| Webpage Browsing | 15922 | 15685 | 15694 | 15643 |
| Voice Call | 5281 | 5263 | 5300 | 5217 |
| Short Messaging Service | 5302 | 5265 | 5301 | 5246 |

Table 2.1: Test Statistics

4. NETWORK COVERAGE – 4G

During the survey, while conducting data test in technology auto detect mode, 4G/LTE signal strength samples were recorded on survey routes. City wise compliance of 90% Confidence Level of signal strength is shown in Table 4.1: 4G Signal Confidence Level- Technology Auto Detect Mode.

| 4G Signal Confidence Level- Technology Auto Detect Mode | | | | | | | | |
|---|----------------------|--------------|--------------|--------------|--------------------|-----------|-----------|-----------|
| City | Confidence Level (%) | | | | Compliant (Yes/No) | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 97.29 | 84.44 | 94.92 | 97.34 | Yes | No | Yes | Yes |
| Gawadar | 93.91 | 75.69 | 91.20 | 98.93 | Yes | No | Yes | Yes |
| Hangu | 82.66 | 51.05 | 99.75 | 86.20 | No | No | Yes | No |
| Hub | 93.66 | 74.97 | 96.64 | 98.17 | Yes | No | Yes | Yes |
| Hyderabad | 98.01 | 74.25 | 94.11 | 99.06 | Yes | No | Yes | Yes |
| Kasur | 97.60 | 50.12 | 91.30 | 96.02 | Yes | No | Yes | Yes |
| Korangi | 99.29 | 92.75 | 98.13 | 99.81 | Yes | Yes | Yes | Yes |
| Murree | 74.71 | 86.38 | 80.32 | 81.98 | No | No | No | No |
| Pano Aqil | 96.93 | 80.54 | 52.23 | 99.08 | Yes | No | No | Yes |
| Quetta | 97.76 | 86.89 | 98.93 | 98.60 | Yes | No | Yes | Yes |
| Sialkot | 97.60 | 83.42 | 99.80 | 96.54 | Yes | No | Yes | Yes |
| Sadiqabad | 97.43 | 83.21 | 84.63 | 99.83 | Yes | No | No | Yes |
| Sukkur | 99.45 | 90.41 | 98.24 | 99.53 | Yes | Yes | Yes | Yes |
| Swabi | 84.03 | 88.67 | 95.97 | 97.27 | No | No | Yes | Yes |
| Toba Tek Singh | 98.60 | 88.14 | 99.03 | 96.40 | Yes | No | Yes | Yes |
| Ziarat | N/A | 93.85 | 71.80 | 90.17 | N/A | Yes | No | Yes |
| Faisalabad | 98.68 | 94.94 | 96.54 | 98.16 | Yes | Yes | Yes | Yes |
| Daska | 95.81 | 83.65 | 97.58 | 96.51 | Yes | No | Yes | Yes |

N/A indicates 4G services not available.

Table 4.1: 4G Signal Confidence Level 90%- Technology Auto Detect Mode

5. NETWORK COVERAGE – 3G

During the survey, 3G signal strength samples were also recorded on survey routes, wherever network switched to 3G while keeping the mobile handset in technology auto detect mode. City wise compliance of 90% Confidence Level of signal strength is shown in Table 5.1: 3G Signal Confidence Level - Technology Auto Detect Mode.

| 3G Signal Confidence Level - Technology Auto Detect Mode | | | | | | | | |
|--|----------------------|--------------|--------------|-------|--------------------|-----------|-----------|------|
| City | Confidence Level (%) | | | | Compliant (Yes/No) | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | N/A | N/A | 100 | N/A | N/A | N/A | Yes | N/A |
| Gawadar | 100 | N/A | 100 | N/A | Yes | N/A | Yes | N/A |
| Hangu | N/A | 93.02 | 100 | 100 | N/A | Yes | Yes | Yes |
| Hub | N/A | 100 | 100 | N/A | N/A | Yes | Yes | N/A |
| Hyderabad | N/A | 100 | 100 | 100.0 | N/A | Yes | Yes | Yes |
| Kasur | N/A | 84.59 | 100 | N/A | N/A | No | Yes | N/A |
| Korangi | N/A | 100 | 100 | 100 | N/A | Yes | Yes | Yes |
| Murree | 98.71 | 83.44 | 97.09 | 93.59 | Yes | No | Yes | Yes |
| Pano Aqil | N/A | 89.95 | 70.10 | N/A | N/A | No | No | N/A |
| Quetta | N/A | 100 | 100 | 100 | N/A | Yes | Yes | Yes |
| Sialkot | N/A | 100 | 100 | N/A | N/A | Yes | Yes | N/A |
| Sadiqabad | N/A | N/A | 93.63 | N/A | N/A | N/A | Yes | N/A |
| Sukkur | N/A | N/A | 98.91 | 100 | N/A | N/A | Yes | Yes |
| Swabi | N/A | 100 | 99.92 | 100 | N/A | Yes | Yes | Yes |
| Toba Tek Singh | N/A | 100 | N/A | N/A | N/A | Yes | N/A | N/A |
| Ziarat | 99.48 | 99.90 | 81.85 | 100 | Yes | Yes | No | Yes |
| Faisalabad | N/A | 100 | N/A | N/A | N/A | Yes | N/A | N/A |
| Daska | N/A | 100 | 100 | 100 | N/A | Yes | Yes | Yes |

N/A indicates no fallback to 3G

Table 5.1: 3G Signal Confidence Level - Technology Auto Detect Mode

6. MOBILE BROADBAND SERVICE – DATA SPEED

Automode Testing. In order to measure the performance of Mobile Broadband Services, Data Download and Upload tests were performed. During the test, a File of 10GB was downloaded and Uploaded for 3 minutes duration. Test Statistics are shown in Table 6.1: Data Tests Statistics while the Download and Upload Speed Results are shown in Table 6.2: Download Data Throughput and Table 6.3: Upload Data Throughput respectively.

| DESCRIPTION | | Jazz | Telenor | Ufone | Zong |
|-------------|--------------|-------|---------|--------|-------|
| DOWNLOAD | ATTEMPTS | 7920 | 7798 | 7816 | 7839 |
| | SPEED (Mbps) | 21.64 | 8.17 | 10.33 | 21.70 |
| UPLOAD | ATTEMPTS | 7938 | 7816 | 7827 | 7855 |
| | SPEED (Mbps) | 18.51 | 5.49 | 14.025 | 18.48 |

Table 6.1: Data Tests Statistics

| Download Data Throughput >4Mbps | | | | | | | | |
|---------------------------------|---------------------------------|---------|-------|-------|-------------------|---------|--------|--------|
| City | Download Data Throughput [Mbps] | | | | Operator Position | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 33.51 | 8.76 | 11.90 | 21.28 | First | Fourth | Third | Second |
| Gawadar | 10.73 | 6.92 | 8.27 | 22.65 | Second | Fourth | Third | First |
| Hangu | 15.85 | 6.63 | 5.97 | 29.44 | Second | Third | Fourth | First |
| Hub | 20.64 | 5.26 | 6.74 | 17.88 | First | Fourth | Third | Second |
| Hyderabad | 30.99 | 6.49 | 14.57 | 23.27 | First | Fourth | Third | Second |

| | | | | | | | | |
|----------------|-------------|-------------|-------------|-------|---------------|---------------|--------------|--------|
| Kasur | 15.04 | 15.75 | 10.04 | 23.14 | Third | Second | Fourth | First |
| Korangi | 31.14 | 12.23 | 11.73 | 23.35 | First | Third | Fourth | Second |
| Murree | 12.57 | 2.32 | 3.78 | 13.08 | Second | Fourth | Third | First |
| Pano Aqil | 10.64 | 2.42 | 11.31 | 13.79 | Third | Fourth | Second | First |
| Quetta | 34.54 | 8.81 | 11.68 | 24.98 | First | Fourth | Third | Second |
| Sialkot | 17.57 | 9.38 | 8.17 | 20.08 | Second | Third | Fourth | First |
| Sadiqabad | 19.46 | 6.64 | 10.53 | 17.98 | First | Fourth | Third | Second |
| Sukkur | 22.24 | 7.70 | 8.20 | 17.55 | First | Fourth | Third | Second |
| Swabi | 25.14 | 2.85 | 5.19 | 13.05 | First | Fourth | Third | Second |
| Toba Tek Singh | 13.07 | 6.45 | 7.84 | 15.60 | Second | Fourth | Third | First |
| Ziarat | 0.08 | 8.26 | 10.67 | 62.91 | Fourth | Third | Second | First |
| Faisalabad | 17.51 | 10.11 | 14.73 | 19.51 | Second | Fourth | Third | First |
| Daska | 23.01 | 9.18 | 16.70 | 20.64 | First | Fourth | Third | Second |

Table 6.2: Download Data Throughput

| Upload Data Throughput ≥ 1Mbps | | | | | | | | |
|--------------------------------|-------------------------------|---------|-------|-------|-------------------|---------|--------|--------|
| City | Upload Data Throughput [Mbps] | | | | Operator Position | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 22.57 | 6.14 | 15.32 | 16.64 | First | Fourth | Third | Second |
| Gawadar | 13.50 | 5.97 | 12.88 | 18.50 | Second | Fourth | Third | First |
| Hangu | 14.84 | 5.64 | 12.45 | 13.87 | First | Fourth | Third | Second |
| Hub | 22.08 | 3.87 | 13.20 | 15.57 | First | Fourth | Third | Second |
| Hyderabad | 22.64 | 2.89 | 17.36 | 17.07 | First | Fourth | Second | Third |
| Kasur | 19.92 | 6.28 | 14.69 | 15.77 | First | Fourth | Third | Second |
| Korangi | 27.12 | 6.21 | 17.79 | 19.17 | First | Fourth | Third | Second |
| Murree | 10.71 | 5.33 | 5.82 | 9.97 | First | Fourth | Third | Second |
| Pano Aqil | 11.61 | 1.37 | 11.81 | 19.24 | Third | Fourth | Second | First |
| Quetta | 19.46 | 5.21 | 12.14 | 16.85 | First | Fourth | Third | Second |
| Sialkot | 19.50 | 6.2 | 15.12 | 20.9 | Second | Fourth | Third | First |
| Sadiqabad | 14.75 | 4.26 | 13.41 | 17.40 | Second | Fourth | Third | First |
| Sukkur | 22.15 | 5.69 | 16.72 | 22.55 | Second | Fourth | Third | First |
| Swabi | 15.14 | 4.80 | 9.05 | 17.31 | Second | Fourth | Third | First |
| Toba Tek Singh | 14.90 | 3.65 | 13.78 | 17.51 | Second | Fourth | Third | First |
| Ziarat | 0.02 | 5.28 | 9.82 | 23.14 | Fourth | Third | Second | First |
| Faisalabad | 13.82 | 6.08 | 16.83 | 22.15 | Third | Fourth | Second | First |
| Daska | 23.37 | 5.96 | 15.26 | 21.99 | First | Fourth | Third | Second |

Table 6.3: Upload Data Throughput

3rd Party Application. Upload and Download Throughputs were tested using a 3rd Party Network Testing Application. Test Statistics are shown in Table 6.4: 3rd Party Application Tests Statistics while the Download and Upload Speed Results are shown in Table 6.5: Download Data Throughput and Table 6.6: Upload Data Throughput respectively.

| DESCRIPTION | | Jazz | Telenor | Ufone | Zong |
|-------------|--------------|-------|---------|-------|-------|
| DOWNLOAD | ATTEMPTS | 11152 | 11130 | 11151 | 11108 |
| | SPEED (Mbps) | 33.21 | 7.95 | 12.68 | 32.56 |
| UPLOAD | ATTEMPTS | 11152 | 11130 | 11151 | 11108 |
| | SPEED (Mbps) | 22.74 | 6.18 | 16.10 | 23.18 |

Table 6.4: 3rd Party Application Tests Statistics

| 3 rd Party App Download Data Throughput >4Mbps | | | | | | | | |
|---|---------------------------------|-------------|-------|-------|-------------------|---------------|--------|--------|
| City | Download Data Throughput [Mbps] | | | | Operator Position | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 54.43 | 6.84 | 16.16 | 34.60 | First | Fourth | Third | Second |
| Gawadar | 7.96 | 9.23 | 37.02 | 10.28 | Fourth | Third | First | Second |
| Hangu | 24.22 | 3.87 | 7.02 | 37.89 | Second | Fourth | Third | First |
| Hub | 30.17 | 6.76 | 9.18 | 27.25 | First | Fourth | Third | Second |
| Hyderabad | 30.99 | 11.00 | 18.84 | 36.79 | Second | Fourth | Third | First |
| Kasur | 20.21 | 14.66 | 10.76 | 32.29 | Second | Third | Fourth | First |
| Korangi | 39.69 | 15.47 | 14.25 | 37.27 | First | Third | Fourth | Second |
| Murree | 18.88 | 1.96 | 6.38 | 23.87 | Second | Fourth | Third | First |
| Pano Aqil | 22.06 | 4.29 | 13.90 | 26.59 | Second | Fourth | Third | First |
| Quetta | 34.76 | 11.18 | 12.63 | 23.10 | First | Fourth | Third | Second |
| Sialkot | 23.99 | 9.72 | 9.68 | 32.05 | Second | Third | Fourth | First |
| Sadiqabad | 36.88 | 7.09 | 13.92 | 26.79 | First | Fourth | Third | Second |
| Sukkur | 39.58 | 10.20 | 11.52 | 31.00 | First | Fourth | Third | Second |
| Swabi | 39.58 | 2.11 | 7.76 | 22.37 | First | Fourth | Third | Second |
| Toba Tek Singh | 23.56 | 10.03 | 11.80 | 25.51 | Second | Fourth | Third | First |
| Ziarat | N/A | 6.22 | 7.54 | 18.64 | N/A | Third | Second | First |
| Faisalabad | 36.77 | 14.08 | 18.21 | 20.07 | First | Fourth | Third | Second |
| Daska | 35.91 | 5.95 | 13.65 | 29.14 | First | Fourth | Third | Second |

N/A indicates 3G/4G services not available.

Table 6.5: 3rd Party App Download Data Throughput

| 3 rd Party App Upload Data Throughput ≥ 1Mbps | | | | | | | | |
|--|-------------------------------|---------|-------|-------|-------------------|---------|--------|--------|
| City | Upload Data Throughput [Mbps] | | | | Operator Position | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 30.28 | 7.18 | 19.02 | 16.95 | First | Fourth | Second | Third |
| Gawadar | 14.21 | 6.88 | 26.74 | 16.31 | Third | Fourth | First | Second |
| Hangu | 24.64 | 6.17 | 13.58 | 20.85 | First | Fourth | Third | Second |
| Hub | 24.71 | 5.59 | 16.37 | 20.52 | First | Fourth | Third | Second |
| Hyderabad | 25.5 | 5.6 | 24.4 | 28.3 | Second | Fourth | Third | First |
| Kasur | 21.75 | 6.34 | 15.41 | 22.68 | Second | Fourth | Third | First |
| Korangi | 28.00 | 7.27 | 22.12 | 29.30 | Second | Fourth | Third | First |
| Murree | 11.53 | 6.24 | 7.14 | 17.02 | Second | Fourth | Third | First |
| Pano Aqil | 19.77 | 2.05 | 9.70 | 26.18 | Second | Fourth | Third | First |
| Quetta | 9.65 | 6.20 | 7.62 | 16.21 | Second | Fourth | Third | First |
| Sialkot | 22.75 | 5.99 | 16.53 | 26.98 | Second | Fourth | Third | First |
| Sadiqabad | 21.36 | 3.78 | 14.62 | 20.60 | First | Fourth | Third | Second |
| Sukkur | 27.00 | 5.70 | 16.80 | 30.00 | Second | Fourth | Third | First |
| Swabi | 25.08 | 3.35 | 17.06 | 21.05 | First | Fourth | Third | Second |
| Toba Tek Singh | 22.98 | 5.60 | 19.36 | 22.79 | First | Fourth | Third | Second |
| Ziarat | N/A | 4.20 | 6.16 | 9.41 | N/A | Third | Second | First |
| Faisalabad | 23.77 | 8.25 | 20.07 | 29.34 | Second | Fourth | Third | First |
| Daska | 19.27 | 5.14 | 13.85 | 21.55 | Second | Fourth | Third | First |

N/A indicates 3G/4G services not available.

Table 6.6: 3rd Party App Upload Data Throughput

7. MOBILE BROADBAND SERVICE – LATENCY

Latency, while not a traditional KPI (non-service KPI), is a vital metric for Mobile Broadband Performance, as it directly affects user experience. During the survey, Network Latency was measured by calculating the ping

between different websites and 3rd Party Test servers. Latency Test Statistics are shown in Table 7.1: Latency Tests Statistics while the Results are shown in Table 7.2: Automode Latency and Table 7.3: 3rd Party App Latency respectively.

| DESCRIPTION | Jazz | Telenor | Ufone | Zong | |
|---------------------------------|--------------|---------|-------|-------|-------|
| Automode | ATTEMPTS | 8003 | 7914 | 7920 | 7929 |
| | LATENCY (ms) | 122.52 | 84.99 | 94.74 | 88.42 |
| 3rd Party App | ATTEMPTS | 11152 | 11130 | 11151 | 11108 |
| | LATENCY (ms) | 35 | 40 | 39.6 | 22.4 |

Table 7.1: Latency Tests Statistics

| Latency In Automode Testing | | | | | | | | |
|-----------------------------|------------------------|---------------|---------------|---------------|--------------------|-----------|-----------|-----------|
| City | Latency [milliseconds] | | | | Compliant (Yes/No) | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 97.68 | 61.91 | 67.22 | 101.26 | No | Yes | Yes | No |
| Gawadar | 374.48 | 84.46 | 123.48 | 91.85 | No | No | No | No |
| Hangu | 116.55 | 102.80 | 105.31 | 96.73 | No | No | No | No |
| Hub | 137.82 | 117.45 | 117.33 | 118.61 | No | No | No | No |
| Hyderabad | 72.84 | 113.79 | 93.22 | 53.88 | Yes | No | No | Yes |
| Kasur | 101.05 | 56.17 | 73.68 | 59.56 | No | Yes | Yes | Yes |
| Korangi | 88.05 | 60.49 | 87.68 | 56.55 | No | Yes | No | Yes |
| Murree | 130.98 | 81.25 | 129.96 | 134.65 | No | No | No | No |
| Pano Aqil | 118.00 | 110.00 | 66.00 | 105.00 | No | No | Yes | No |
| Quetta | 111.56 | 99.29 | 134.54 | 90.26 | No | No | No | No |
| Sialkot | 105.56 | 61.38 | 79.16 | 62.02 | No | Yes | No | Yes |
| Sadiqabad | 121.46 | 116.59 | 122.27 | 102.47 | No | No | No | No |
| Sukkur | 95.00 | 106.00 | 94.00 | 80.00 | No | No | No | No |
| Swabi | 134.92 | 121.27 | 116.10 | 121.97 | No | No | No | No |
| Toba Tek Singh | 120.76 | 99.99 | 129.85 | 112.07 | No | No | No | No |
| Ziarat | 1237.83 | 97.62 | 104.69 | 78.65 | No | No | No | No |
| Faisalabad | 129.37 | 88.26 | 80.90 | 80.63 | No | No | No | No |
| Daska | 102.95 | 57.16 | 65.49 | 57.61 | No | Yes | Yes | Yes |

Table 7.2: Automode Latency

| Latency in 3 rd Party App Testing | | | | | | | | |
|--|------------------------|--------------|-------|-------|--------------------|-----------|-------|------|
| City | Latency [milliseconds] | | | | Compliant (Yes/No) | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 22.50 | 34.25 | 21.45 | 18.36 | Yes | Yes | Yes | Yes |
| Gawadar | 218.65 | 34.40 | 36.48 | 24.97 | No | Yes | Yes | Yes |
| Hangu | 25.97 | 44.45 | 42.48 | 27.75 | Yes | Yes | Yes | Yes |
| Hub | 27.95 | 29.64 | 26.33 | 25.34 | Yes | Yes | Yes | Yes |
| Hyderabad | 21.93 | 27.96 | 27.57 | 21.32 | Yes | Yes | Yes | Yes |
| Kasur | 33.27 | 23.80 | 36.85 | 18.48 | Yes | Yes | Yes | Yes |
| Korangi | 21.51 | 23.91 | 21.63 | 16.07 | Yes | Yes | Yes | Yes |
| Murree | 31.33 | 36.50 | 37.65 | 19.61 | Yes | Yes | Yes | Yes |
| Pano Aqil | 35.19 | 77.73 | 40.62 | 30.00 | Yes | No | Yes | Yes |
| Quetta | 32.93 | 43.09 | 68.70 | 30.61 | Yes | Yes | Yes | Yes |
| Sialkot | 33.48 | 24.96 | 34.85 | 21.34 | Yes | Yes | Yes | Yes |
| Sadiqabad | 40.64 | 48.02 | 51.29 | 23.58 | Yes | Yes | Yes | Yes |
| Sukkur | 24.52 | 30.96 | 40.79 | 28.00 | Yes | Yes | Yes | Yes |
| Swabi | 38.58 | 77.73 | 44.11 | 27.41 | Yes | No | Yes | Yes |

| | | | | | | | | |
|----------------|----------------|--------------|--------------|--------------|-----------|-----------|-----------|-----------|
| Toba Tek Singh | 25.62 | 41.27 | 87.37 | 22.27 | Yes | Yes | No | Yes |
| Ziarat | 1238.00 | 98.00 | 63.00 | 79.00 | No | No | Yes | No |
| Faisalabad | 23.66 | 40.03 | 37.60 | 19.98 | Yes | Yes | Yes | Yes |
| Daska | 35.19 | 24.36 | 45.06 | 19.95 | Yes | Yes | Yes | Yes |

Table 7.3: 3rd Party App Latency

8. MOBILE BROADBAND SERVICE – WEB PAGE LOADING

Web Page Loading Time is an important Quality of Experience (QoE) metric, which, although not a traditional service KPI(non-service), provides valuable insights into the performance of CMOs in delivering seamless web browsing experiences . Results of testing are shown in Table 8.1: Web Page Loading Time.

| Webpage Loading Time in Technology Auto Detect Mode | | | | | | | | |
|---|--------------------------------|-------------|-------------|-------------|--------------------|-----------|-----------|-----------|
| City | Webpage Loading Time [seconds] | | | | Compliant (Yes/No) | | | |
| | Jazz | Telenor | Ufone | ZonG | Jazz | Telenor | Ufone | ZonG |
| Attock | 2.23 | 3.74 | 3.33 | 2.45 | Yes | Yes | Yes | Yes |
| Gawadar | 8.75 | 7.94 | 8.21 | 5.96 | No | No | No | No |
| Hangu | 7.18 | 9.92 | 8.81 | 6.83 | No | No | No | No |
| Hub | 6.16 | 6.83 | 7.18 | 5.71 | No | No | No | No |
| Hyderabad | 5.95 | 8.33 | 7.84 | 5.54 | No | No | No | No |
| Kasur | 7.12 | 7.62 | 7.33 | 7.57 | No | No | No | No |
| Korangi | 4.95 | 6.73 | 7.48 | 5.18 | Yes | No | No | No |
| Murree | 2.66 | 4.86 | 4.32 | 2.53 | Yes | Yes | Yes | Yes |
| Pano Aqil | 7.02 | 0.15 | 0.19 | 0.64 | No | Yes | Yes | Yes |
| Quetta | 5.44 | 6.52 | 5.80 | 5.56 | No | No | No | No |
| Sialkot | 6.85 | 7.35 | 7.03 | 7.01 | No | No | No | No |
| Sadiqabad | 0.59 | 0.48 | 0.24 | 0.12 | Yes | Yes | Yes | Yes |
| Sukkur | 6.70 | 0.61 | 0.20 | 0.71 | No | Yes | Yes | Yes |
| Swabi | 6.50 | 4.47 | 5.14 | 6.41 | No | Yes | No | No |
| Toba Tek Singh | 0.49 | 0.22 | 0.16 | 0.09 | Yes | Yes | Yes | Yes |
| Ziarat | N/A | 7.03 | 7.09 | 4.27 | N/A | No | No | Yes |
| Faisalabad | 0.52 | 0.19 | 0.13 | 0.10 | Yes | Yes | Yes | Yes |
| Daska | 7.22 | 8.71 | 7.92 | 7.56 | No | No | No | No |

N/A indicates 3G/4G services not available.

Table 8.1: Web Page Loading Time

9. VOICE SERVICE

A total of 21,061 Call attempts were made and out of which 570 were failed attempts. In 20,491 successful call attempts, 208 calls dropped prior to completion of two minutes duration, whereas 20,283 calls remained connected for the complete duration of two minutes. The 5 x QoS KPIs (i.e. Network Accessibility, Call Setup Success Rate, Call Setup Time, Call Completion Rate and Mean Opinion Score) have been measured while testing voice services in the surveyed cities. Company wise call statistics is shown in Table 9.1: Call Statistics, while the compliance in each surveyed city is shown in Table 9.2: Voice QoS KPIs Compliance Level, Table 9.3: Voice QoS KPIs Compliance Level and Table 9.4: Voice QoS KPIs Compliance Level

| Description | Jazz | Telenor | Ufone | Zong |
|-----------------------------|-------|---------|-------|-------|
| Total Calls Attempts | 5281 | 5263 | 5300 | 5217 |
| Failed Calls | 85 | 265 | 129 | 91 |
| Established Calls | 5196 | 4998 | 5171 | 5126 |
| Dropped Calls | 29 | 81 | 65 | 33 |
| Completed Calls | 5167 | 4917 | 5106 | 5093 |
| Call Setup Success Rate (%) | 98.39 | 94.96 | 97.57 | 98.26 |
| Call Setup Time (Sec) | 3.54 | 3.73 | 5.43 | 5.29 |
| Call Completion Rate (%) | 99.44 | 98.38 | 98.74 | 99.36 |
| Mean Opinion Score | 3.73 | 3.6 | 3.47 | 3.67 |

Table 9.1: Call Statistic

| CMO | KPI | Attock | Gawadar | Hangu | Hub | Hyderabad | Kasur |
|---------|------|-----------|-----------|-----------|-----------|-----------|-----------|
| Jazz | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | No | Yes | No | Yes | No |
| | CCT | Yes | No | Yes | Yes | Yes | Yes |
| | CCR | No | No | Yes | Yes | Yes | Yes |
| | MOS | Yes | No | Yes | Yes | Yes | Yes |
| Telenor | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | No | No | No | No | No |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | Yes | Yes | No | No | No |
| | MOS | Yes | No | Yes | No | No | Yes |
| Ufone | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | No | No | Yes | Yes | Yes |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | Yes | Yes | Yes | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |
| ZonG | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | Yes | Yes | No | Yes | No |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | Yes | Yes | Yes | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |

* Note Voice QoS KPIs: Network Accessibility (NA), Call Setup Success Rate (CSSR), Call Connection Time (CCT), Call Completion Ratio (CCR), Mean Opinion Score (MOS)

Table 9.2: Voice QoS KPIs Compliance Level

| CMO | KPI | Korangi | Murree | Pano Aqil | Quetta | Sialkot | Sadiqabad |
|---------|------|-----------|-----------|-----------|-----------|-----------|-----------|
| Jazz | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | No | Yes | Yes | Yes | Yes |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | Yes | Yes | Yes | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |
| Telenor | NA | Yes | No | Yes | Yes | Yes | Yes |
| | CSSR | Yes | No | No | No | No | No |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | No | No | Yes | No | Yes | Yes |
| | MOS | No | Yes | Yes | Yes | Yes | Yes |
| Ufone | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | No | No | Yes | Yes | Yes |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |

| CMO | KPI | Korangi | Murree | Pano Aqil | Quetta | Sialkot | Sadiqabad |
|------|------|---------|-----------|-----------|-----------|---------|-----------|
| | CCR | Yes | No | Yes | No | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |
| ZonG | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | No | Yes | No | Yes | Yes |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | No | Yes | Yes | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |

* Note Voice QoS KPIs: Network Accessibility (NA), Call Setup Success Rate (CSSR), Call Connection Time (CCT) , Call Completion Ratio (CCR) , Mean Opinion Score (MOS)

Table 9.3: Voice QoS KPIs Compliance Level

| CMO | KPI | Sukkur | Swabi | Toba Tek Singh | Ziarat | Faisalabad | Daska |
|---------|------|-----------|-----------|----------------|-----------|------------|-------|
| Jazz | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | Yes | Yes | Yes | No | Yes | Yes |
| | CCT | Yes | Yes | Yes | No | Yes | Yes |
| | CCR | Yes | Yes | Yes | Yes | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |
| Telenor | NA | Yes | Yes | Yes | No | Yes | Yes |
| | CSSR | No | No | No | No | No | Yes |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | Yes | Yes | No | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |
| Ufone | NA | Yes | Yes | Yes | No | Yes | Yes |
| | CSSR | No | No | Yes | No | Yes | Yes |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | Yes | Yes | Yes | Yes | Yes |
| | MOS | Yes | Yes | Yes | No | Yes | Yes |
| ZonG | NA | Yes | Yes | Yes | Yes | Yes | Yes |
| | CSSR | No | Yes | Yes | No | Yes | Yes |
| | CCT | Yes | Yes | Yes | Yes | Yes | Yes |
| | CCR | Yes | Yes | Yes | Yes | Yes | Yes |
| | MOS | Yes | Yes | Yes | Yes | Yes | Yes |

* Note Voice QoS KPIs: Network Accessibility (NA), Call Setup Success Rate (CSSR), Call Connection Time (CCT) , Call Completion Ratio (CCR) , Mean Opinion Score (MOS)

Table 9.4: Voice QoS KPIs Compliance Level

Overall survey results of Voice Services for each Mobile Operator are shown in the below graphs.

10. SMS SERVICE

A total of 20,433 SMS sending attempts were conducted, out of which 20,372 SMS were successfully transmitted by A-Party while 20,203 SMS were successfully received at B-Party. The 2 x SMS QoS KPIs (i.e. Success Rate and Delivery Time) have been measured while testing SMS services in the surveyed cities. Company wise SMS statistics are shown in Table 10.1: SMS Statistics, while the compliance in each surveyed city is shown in Table 10.2: SMS QoS KPIs Compliance Level.

| Description | Jazz | Telenor | Ufone | Zong |
|--------------------------------|-------|---------|-------|-------|
| SMS Send Request | 5302 | 5265 | 5301 | 5246 |
| SMS Successfully Transmitted | 5291 | 5177 | 5264 | 5190 |
| SMS Successfully Received | 5215 | 5060 | 5217 | 5145 |
| SMS Receive Success Rate (%) | 98.36 | 96.11 | 98.42 | 98.07 |
| End-To-End Delivery Time (Sec) | 3.81 | 3.42 | 2.74 | 2.73 |

Table 10.1: SMS Statistics

| Operator | Jazz | | Telenor | | Ufone | | ZonG | | |
|-----------------|----------------|-----|---------|-----|-------|-----|------|-----|-----|
| | SMS KPI | SR | DT | SR | DT | SR | DT | SR | DT |
| Surveyed Cities | Attock | No | Yes | Yes | Yes | Yes | Yes | No | Yes |
| | Gawadar | No | Yes | No | Yes | No | Yes | Yes | Yes |
| | Hangu | Yes | Yes | No | Yes | Yes | Yes | Yes | Yes |
| | Hub | No | Yes | No | Yes | No | Yes | No | Yes |
| | Hyderabad | No | Yes | No | Yes | Yes | Yes | Yes | Yes |
| | Kasur | No | Yes | No | Yes | Yes | Yes | No | Yes |
| | Korangi | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Murree | No | Yes | No | Yes | No | Yes | No | Yes |
| | Pano Aqil | Yes | Yes | No | Yes | No | Yes | Yes | Yes |
| | Quetta | Yes | Yes | No | Yes | No | Yes | No | Yes |
| | Sialkot | No | Yes | No | Yes | Yes | Yes | Yes | Yes |
| | Sadiqabad | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Sukkur | Yes | Yes | Yes | Yes | No | Yes | Yes | Yes |
| | Swabi | Yes | Yes | No | Yes | No | Yes | No | Yes |
| | Toba Tek Singh | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| | Ziarat | No | No | No | Yes | No | Yes | No | Yes |
| | Faisalabad | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Daska | No | Yes | No | Yes | Yes | Yes | Yes | Yes | |

* Note SMS QoS KPIs: Success Rate (SR), Delivery Time (DT)

Table 10.2: SMS QoS KPIs Compliance Level

Overall survey results of SMS Services for each Mobile Operator are shown in the below graphs.

11. SURVEY STANDING - MOBILE NETWORK COVERAGE

The categorization of CMOs in Mobile Network Coverage i.e. Signal Strength of 4G/LTE and 3G Networks (in case of fallback) measured in Technology Auto Detect Mode is shown in Table 11.1: CMOs Standing in Mobile Network Coverage – Technology Auto Detect.

| S. #. | Operator | Compliance Level – Number of Cities Technology Auto Detect Mode | | | | | | Standing |
|-------|----------|--|----|-------|---------------|----|-------|-----------------|
| | | Compliant | | | Non-Compliant | | | |
| | | 4G | 3G | Total | 4G | 3G | Total | |
| 1. | ZonG | 16 | 9 | 25 | 2 | 0 | 2 | 1 st |
| 2. | Jazz | 14 | 3 | 17 | 3 | 0 | 3 | 2 nd |
| 3. | Ufone | 14 | 14 | 28 | 4 | 2 | 6 | 3 rd |
| 4. | Telenor | 4 | 11 | 15 | 14 | 3 | 17 | 4 th |

Table 11.1: CMOs Standing in Mobile Network Coverage – Technology Auto Detect Mode

12. SURVEY STANDING - MOBILE BROADBAND SERVICE

The categorization of each CMOs in Mobile Broadband Service is as under:

- i. Download Data Throughput (Auto Mode). The Download Data Throughput, as per the highest to lowest obtained results, is shown in Table 12.1: CMOs Standing in Download Data Throughput – Auto Mode Testing.

| S. # | Operator | Highest Download Throughput – Number of Cities (Automode) | | | | Standing |
|------|----------|---|-----------------|-----------------|-----------------|-----------------|
| | | 1 st | 2 nd | 3 rd | 4 th | |
| 1. | ZonG | 9 | 9 | 0 | 0 | 1 st |
| 2. | Jazz | 8 | 6 | 2 | 1 | 2 nd |
| 3. | Ufone | 0 | 2 | 12 | 4 | 3 rd |
| 4. | Telenor | 0 | 1 | 4 | 12 | 4 th |

Table 12.1: CMOs Standing in Download Data Throughput– Auto Mode Testing

- ii. Upload Data Throughput (Auto Mode). The Upload Data Throughput, as per the highest to lowest obtained results, is shown in Table 12.2: CMOs Standing in Upload Data Throughput – Auto Mode Testing.

| S. # | Operator | Highest Upload Throughput – Number of Cities ((Automode) | | | | Standing |
|------|----------|--|-----------------|-----------------|-----------------|-----------------|
| | | 1 st | 2 nd | 3 rd | 4 th | |
| 1. | ZonG | 9 | 8 | 1 | 0 | 1 st |
| 2. | Jazz | 9 | 6 | 2 | 1 | 2 nd |
| 3. | Ufone | 0 | 4 | 14 | 0 | 3 rd |
| 4. | Telenor | 0 | 0 | 1 | 17 | 4 th |

Table 12.2: CMOs Standing in Download Data Throughput– Auto Mode Testing

- iii. Webpage Loading Time. The categorization of each CMOs, as per the maximum compliant of Webpage Loading Time, is shown in Table 12.3: CMOs Standing in Webpage Loading Time.

| S. # | Operator | Webpage Loading Time – Number of Cities | | Standing |
|------|----------|---|---------------|-----------------|
| | | Compliant | Non-Compliant | |
| 1. | Telenor | 8 | 10 | 1 st |
| 2. | ZonG | 8 | 10 | 1 st |
| 3. | Ufone | 7 | 11 | 2 nd |
| 4. | Jazz | 6 | 11 | 3 rd |

Table 12.3: CMOs Standing in Webpage Loading Time

- iv. Latency (3rd Party App). The categorization of each CMOs, as per the maximum compliant of cities in terms of Latency, is shown in Table 12.4: CMOs Standing in Latency (3rd Party App).

| S. # | Operator | Latency - Number of Cities | | Standing |
|------|----------|----------------------------|---------------|-----------------|
| | | Compliant | Non-Compliant | |
| 1. | Ufone | 17 | 1 | 1 st |
| 2. | ZonG | 17 | 1 | 1 st |
| 3. | Jazz | 16 | 2 | 2 nd |
| 4. | Telenor | 15 | 3 | 3 rd |

Table 12.4: CMOs Standing in Latency (3rd Party App)

- v. Latency (Automode). The categorization of each CMOs, as per the maximum compliant of cities in terms of Latency, is shown in Table 12.5: CMOs Standing in Latency (Automode).

| S. # | Operator | Latency - Number of Cities | | Standing |
|------|----------|----------------------------|---------------|-----------------|
| | | Compliant | Non-Compliant | |
| 1. | Telenor | 5 | 13 | 1 st |
| 2. | ZonG | 5 | 13 | 1 st |
| 3. | Ufone | 4 | 14 | 2 nd |
| 4. | Jazz | 1 | 17 | 3 rd |

Table 12.5: CMOs Standing in Latency (Automode)

- vi. Download Data Throughput (3rd Party App). 3rd Party App Download Throughput, as per the highest to lowest obtained results, is shown in Table 12.6: CMOs Standing in Download Throughput – 3rd Party App.

| S. # | Operator | Highest Download Throughput – Number of Cities | | | | Standing |
|------|----------|--|-----------------|-----------------|-----------------|-----------------|
| | | 1 st | 2 nd | 3 rd | 4 th | |
| 1. | Jazz | 9 | 7 | 0 | 1 | 1 st |
| 2. | ZonG | 8 | 10 | 0 | 0 | 2 nd |
| 3. | Ufone | 1 | 1 | 13 | 3 | 3 rd |
| 4. | Telenor | 0 | 0 | 5 | 13 | 4 th |

Table 12.6: CMOs Standing in Download Throughput – 3rd Party App

- vii. Upload Data Throughput (3rd Party App). 3rd Party App Upload Throughput, as per the highest to lowest obtained results, is shown in Table 12.7: CMOs Standing in Upload Throughput – 3rd Party App.

| S. # | Operator | Highest Upload Throughput – Number of Cities | | | | Standing |
|------|----------|--|-----------------|-----------------|-----------------|-----------------|
| | | 1 st | 2 nd | 3 rd | 4 th | |
| 1. | ZonG | 11 | 6 | 1 | 0 | 1 st |
| 2. | Jazz | 6 | 10 | 1 | 0 | 2 nd |
| 3. | Ufone | 1 | 2 | 15 | 0 | 3 rd |
| 4. | Telenor | 0 | 0 | 1 | 17 | 4 th |

Table 12.7: CMOs Standing in Upload Throughput – 3rd Party App

13. SURVEY STANDING – VOICE & SMS SERVICE

The categorization of each CMOs, as per the maximum compliant of Voice and SMS QoS KPIs are shown in (i) Table 13.1: CMOs Standing in Voice Service & (ii) Table 13.2: CMOs Standing in SMS Service

| S.# | Operator | Voice QoS KPIs | | Standing |
|-----|----------|----------------|---------------|-----------------|
| | | Compliant | Non-Compliant | |
| 1. | ZonG | 83 | 7 | 1 st |
| 2. | Jazz | 80 | 10 | 2 nd |
| 3. | Ufone | 79 | 11 | 3 rd |
| 4. | Telenor | 62 | 28 | 4 th |

Table 13.1: CMOs Standing in Voice Service

| S. # | Operator | SMS QoS KPIs | | Standing |
|------|----------|--------------|---------------|-----------------|
| | | Compliant | Non-Compliant | |
| 1. | ZonG | 29 | 7 | 1 st |
| 2. | Ufone | 28 | 8 | 2 nd |
| 3. | Jazz | 25 | 11 | 3 rd |
| 4. | Telenor | 24 | 12 | 4 th |

Table 13.2: CMOs Standing in SMS Service

14. SURVEY STANDING - OVERALL

The overall standing of each CMOs in different category of services is mentioned in Table 14.1: CMOs Overall Standing in QoS Survey. The Signal Strength maps are attached as Annex-A and survey results in graphical format are attached as Annex-B.

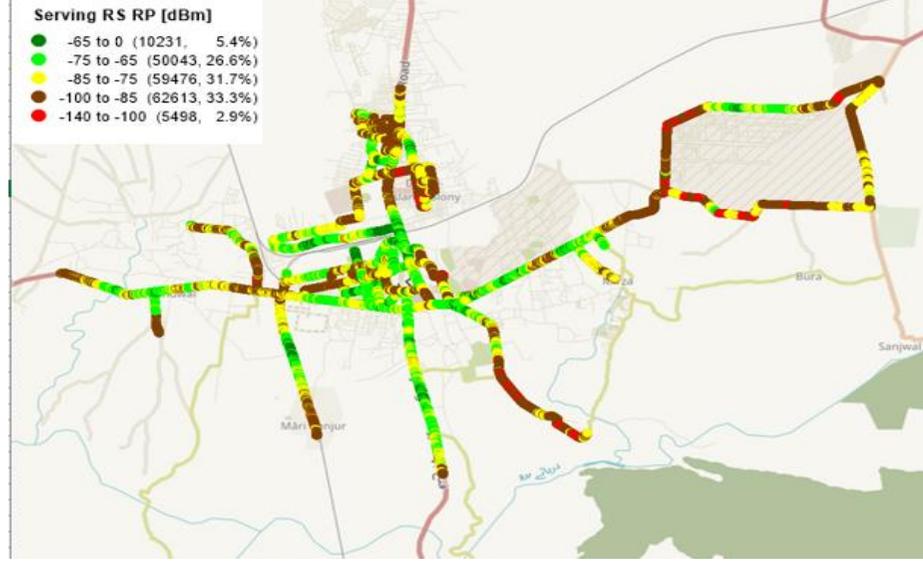
| S. #. | Service | | STANDING | | | | |
|---------------|-------------------------|-----------------------|-----------------|-----------------|-----------------|-----------------|---------|
| | | | 1 st | 2 nd | 3 rd | 4 th | |
| 1. | Mobile Network Coverage | | ZonG | Jazz | Ufone | Telenor | |
| 2. | Mobile Broadband | Auto Mode | Download | ZonG | Jazz | Ufone | Telenor |
| | | | Upload | ZonG | Jazz | Ufone | Telenor |
| | | 3rd Party App | Download | Jazz | ZonG | Ufone | Telenor |
| | | | Upload | ZonG | Jazz | Ufone | Telenor |
| | | Web Page Loading Time | | Telenor ZonG | Ufone | Jazz | - |
| | | Latency | Automode | Telenor ZonG | Ufone | Jazz | - |
| 3rd Party App | ZonG Ufone | | Jazz | Telenor | - | | |
| 3. | Voice | | ZonG | Jazz | Ufone | Telenor | |
| 4. | SMS | | ZonG | Ufone | Jazz | Telenor | |

Table 14.1: CMOs Overall Standing in QoS Survey

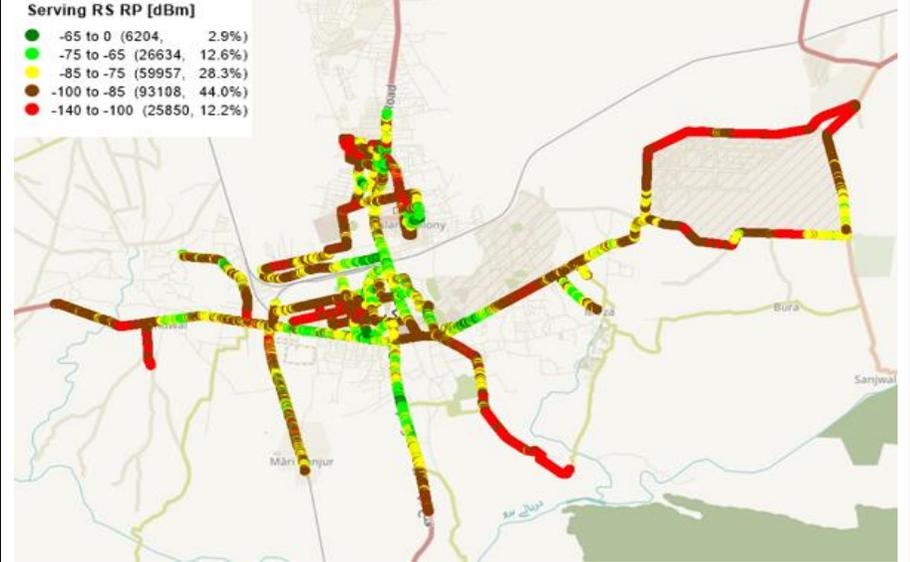
AUTOMODE

AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

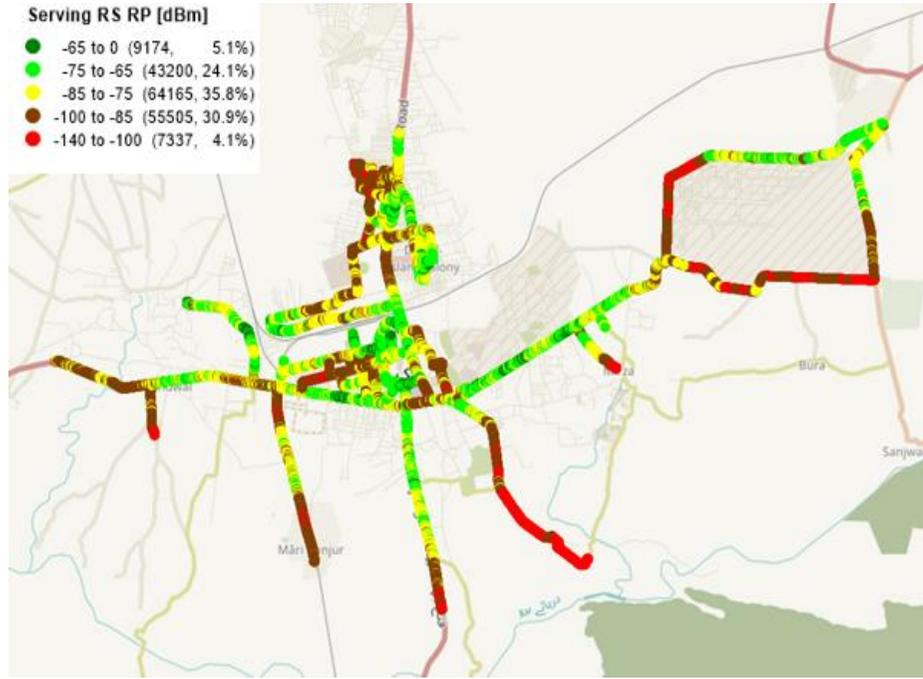
JAZZ NETWORK COVERAGE – ATTOCK



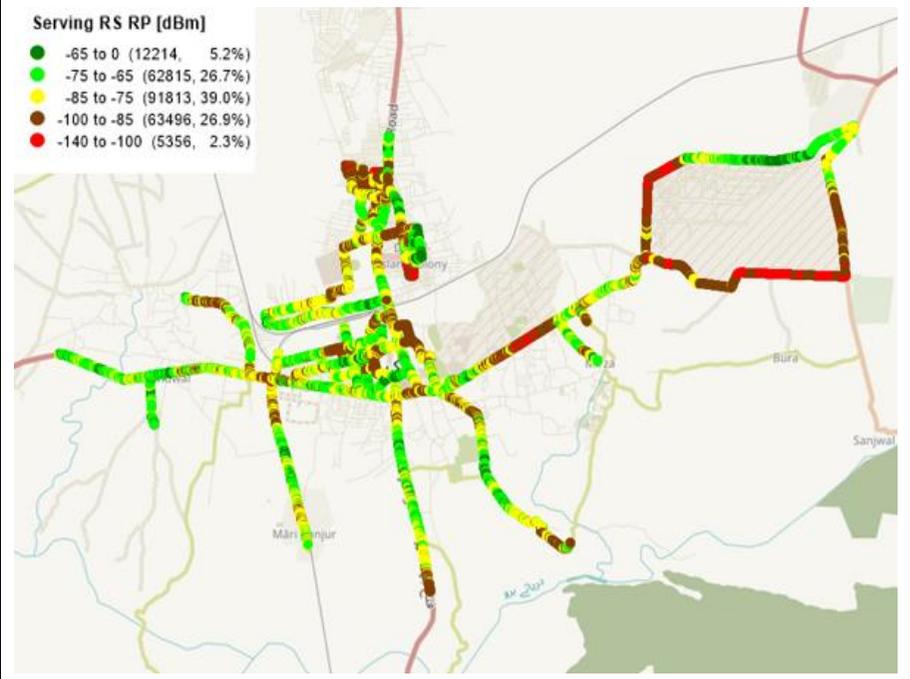
TELENOR NETWORK COVERAGE – ATTOCK



UFONE NETWORK COVERAGE – ATTOCK

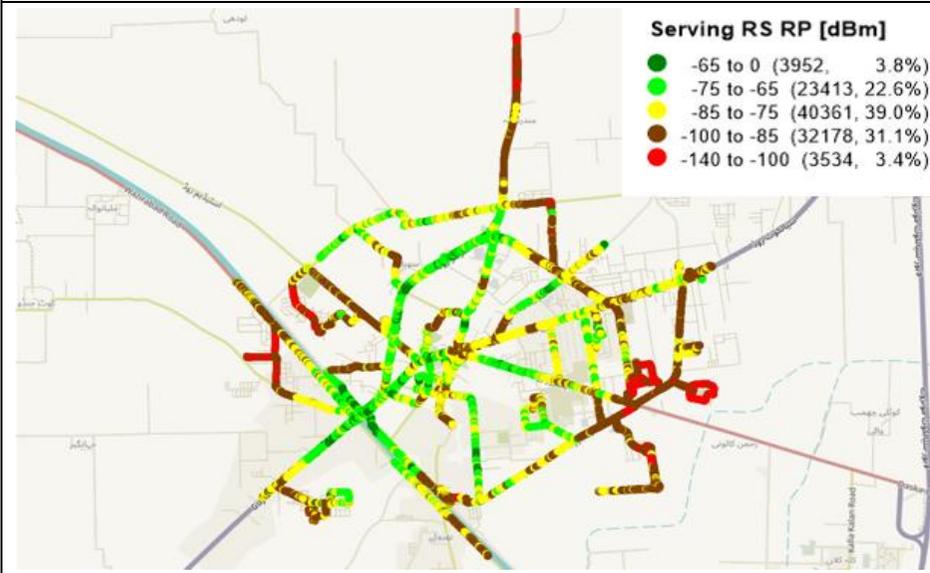


ZONG NETWORK COVERAGE – ATTOCK

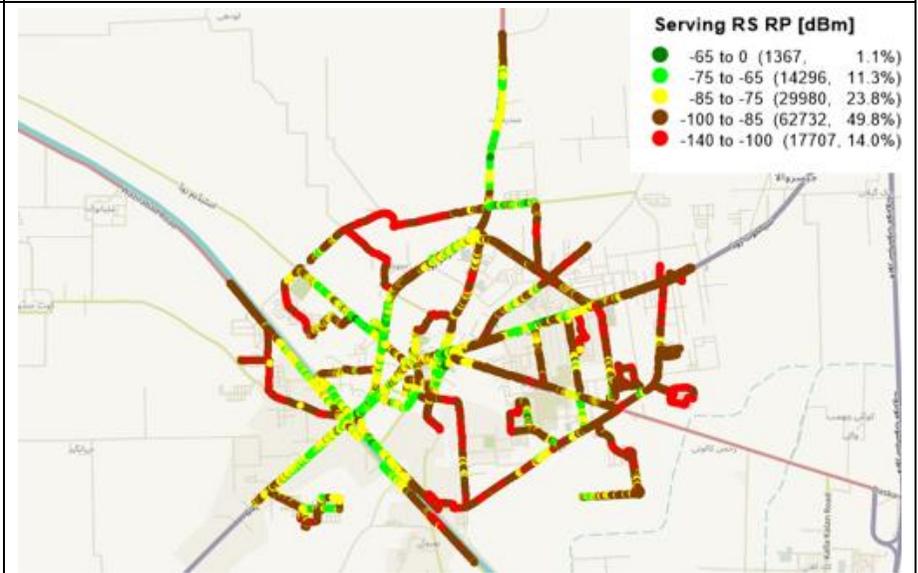


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

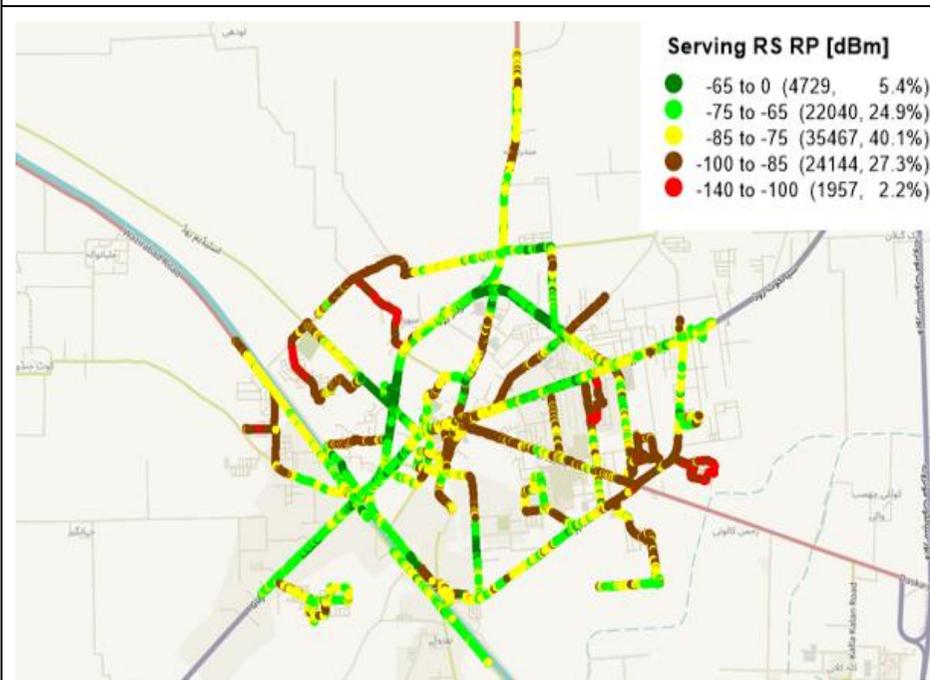
JAZZ NETWORK COVERAGE – DASKA



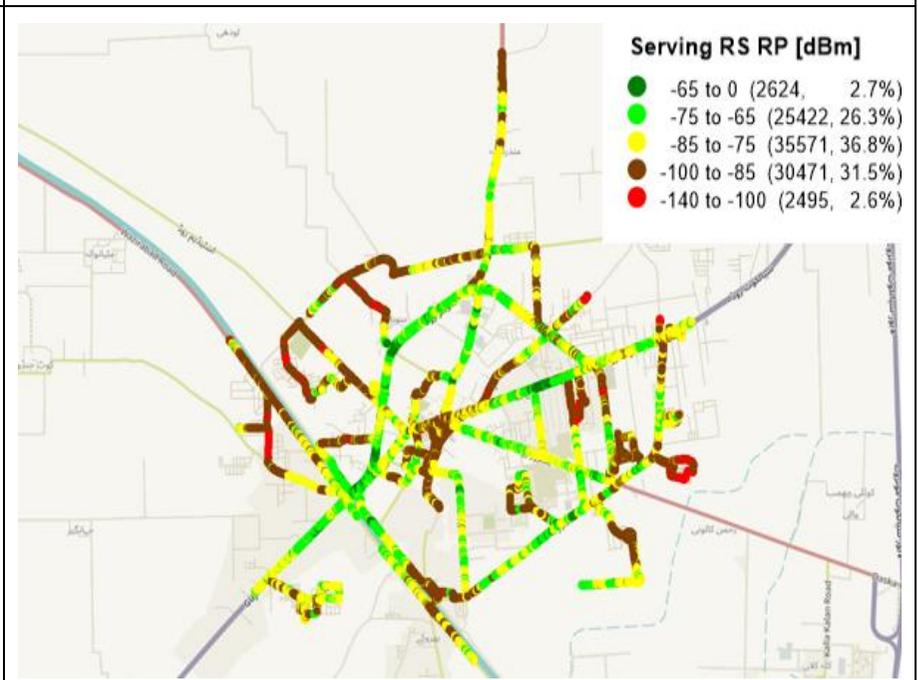
TELENOR NETWORK COVERAGE – DASKA



UFONE NETWORK COVERAGE – DASKA

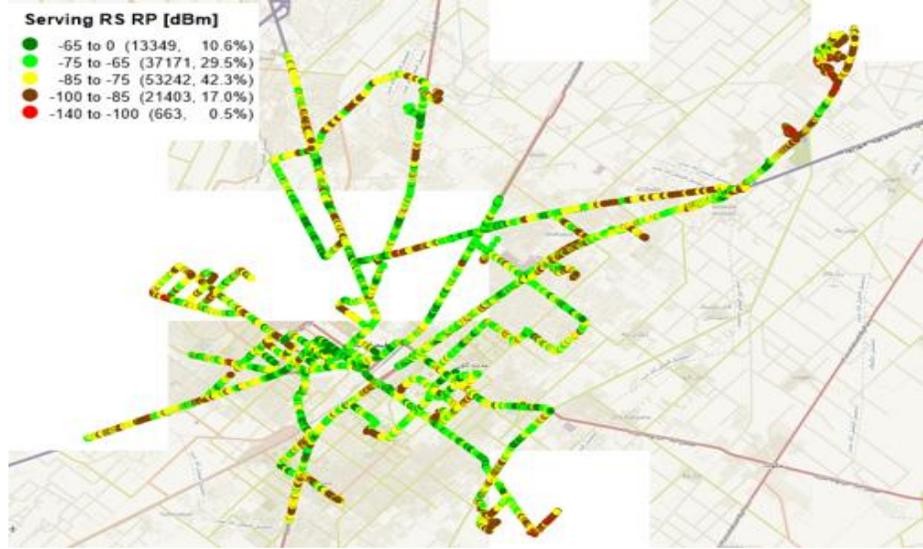


ZONG NETWORK COVERAGE – DASKA

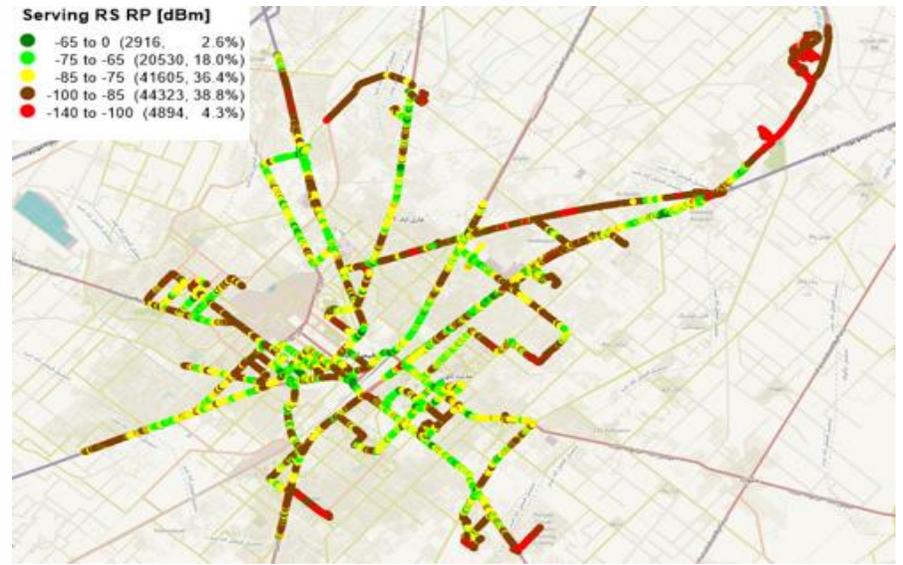


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

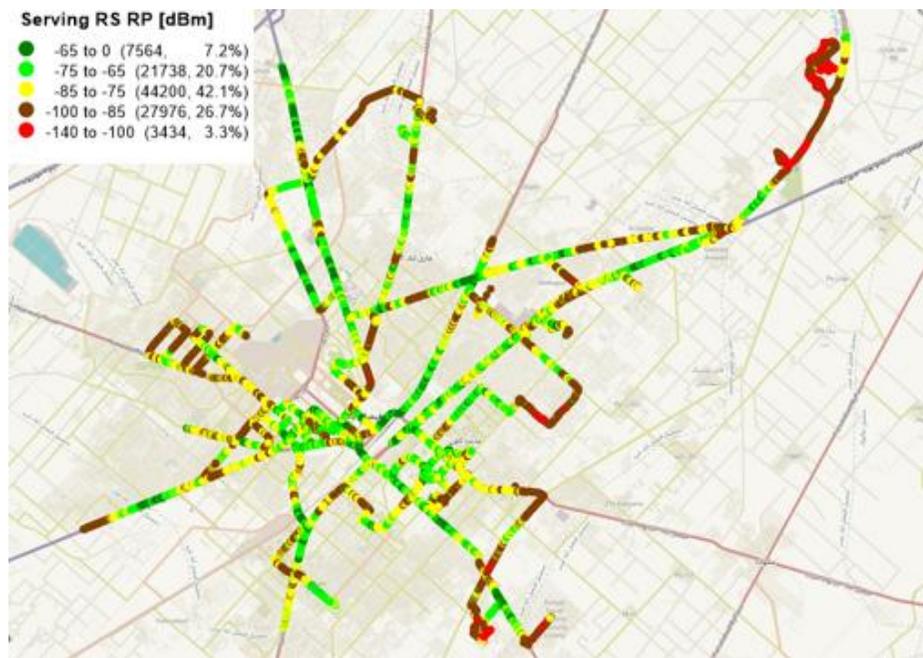
JAZZ NETWORK COVERAGE – FAISALABAD



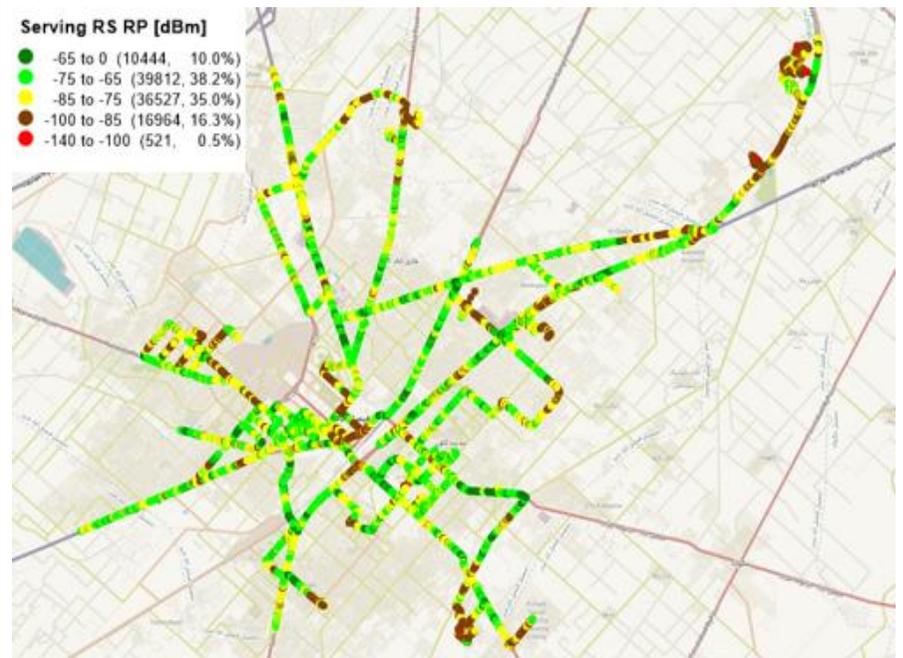
TELENOR NETWORK COVERAGE – FAISALABAD



UFONE NETWORK COVERAGE – FAISALABAD



ZONG NETWORK COVERAGE – FAISALABAD

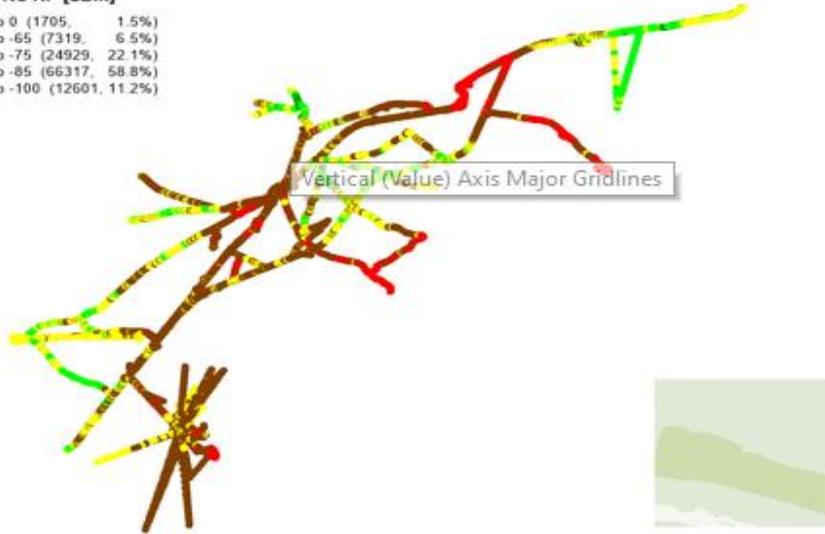


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – HANGU

Serving RS RP [dBm]

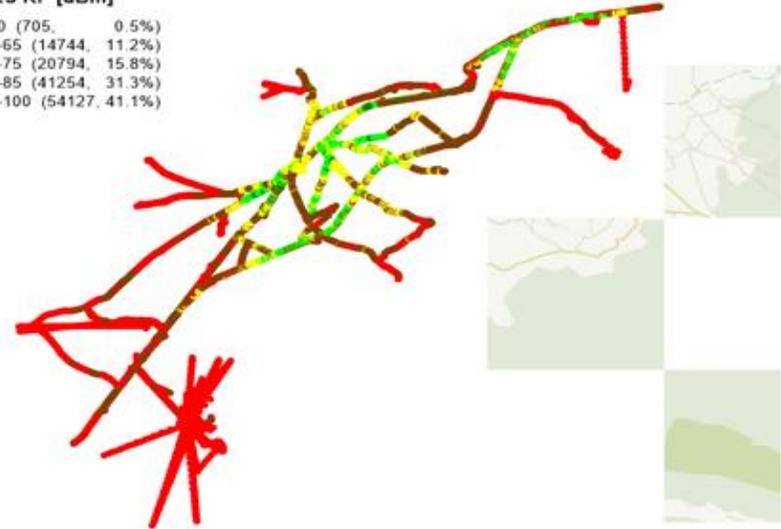
- -65 to 0 (1705, 1.5%)
- -75 to -65 (7319, 6.5%)
- -85 to -75 (24929, 22.1%)
- -100 to -85 (66317, 58.8%)
- -140 to -100 (12601, 11.2%)



TELENOR NETWORK COVERAGE – HANGU

Serving RS RP [dBm]

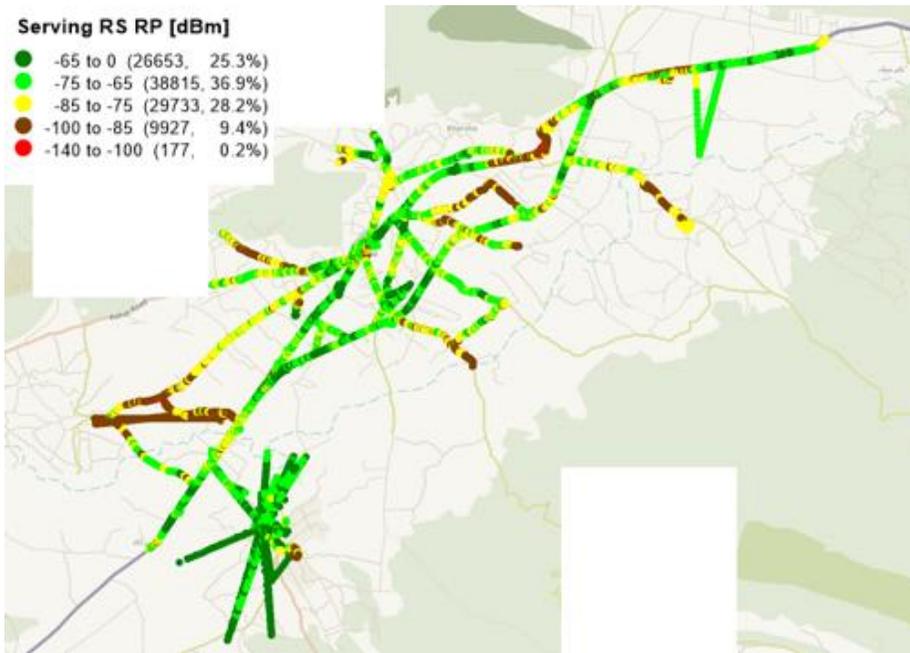
- -65 to 0 (705, 0.5%)
- -75 to -65 (14744, 11.2%)
- -85 to -75 (20794, 15.8%)
- -100 to -85 (41254, 31.3%)
- -140 to -100 (54127, 41.1%)



UFONE NETWORK COVERAGE – HANGU

Serving RS RP [dBm]

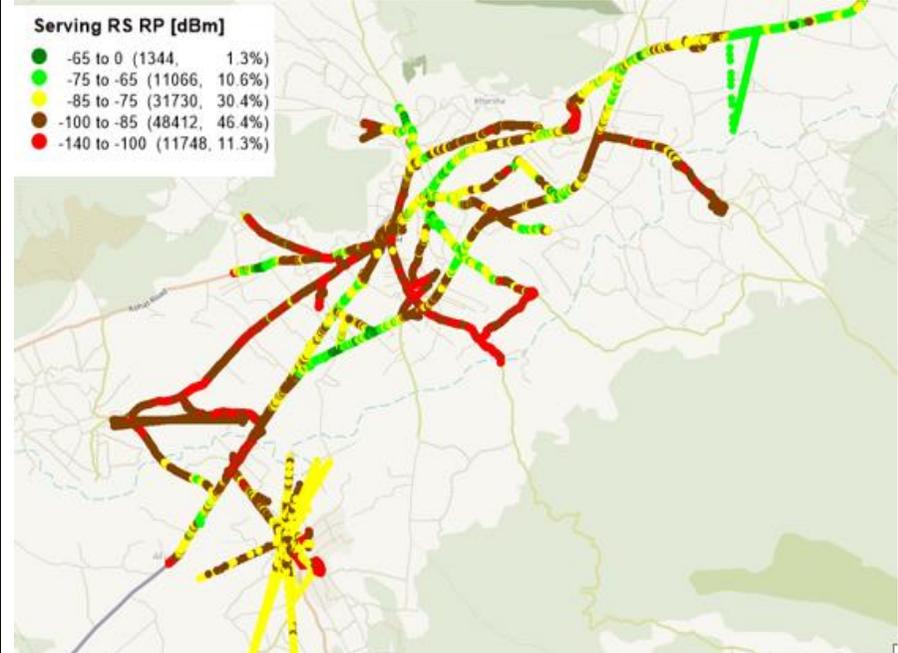
- -65 to 0 (26653, 25.3%)
- -75 to -65 (38815, 36.9%)
- -85 to -75 (29733, 28.2%)
- -100 to -85 (9927, 9.4%)
- -140 to -100 (177, 0.2%)



ZONG NETWORK COVERAGE – HANGU

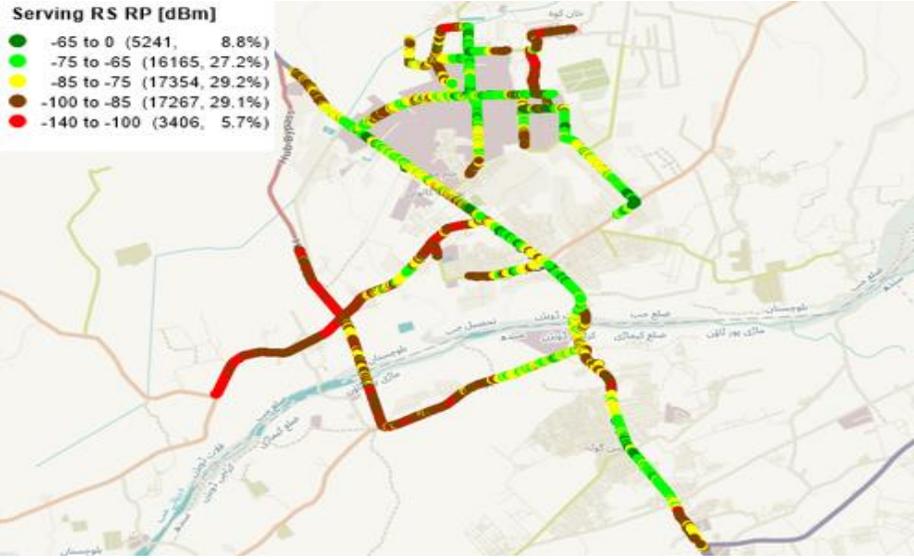
Serving RS RP [dBm]

- -65 to 0 (1344, 1.3%)
- -75 to -65 (11066, 10.6%)
- -85 to -75 (31730, 30.4%)
- -100 to -85 (48412, 46.4%)
- -140 to -100 (11748, 11.3%)

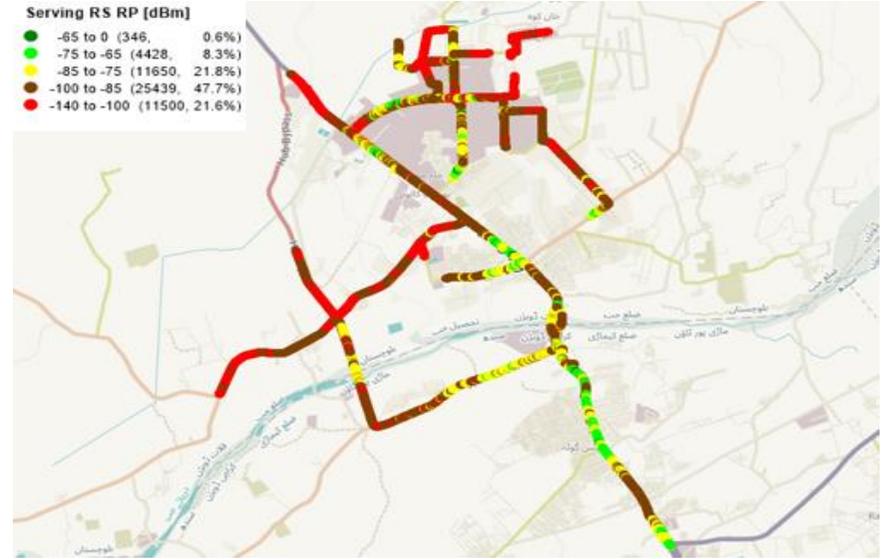


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

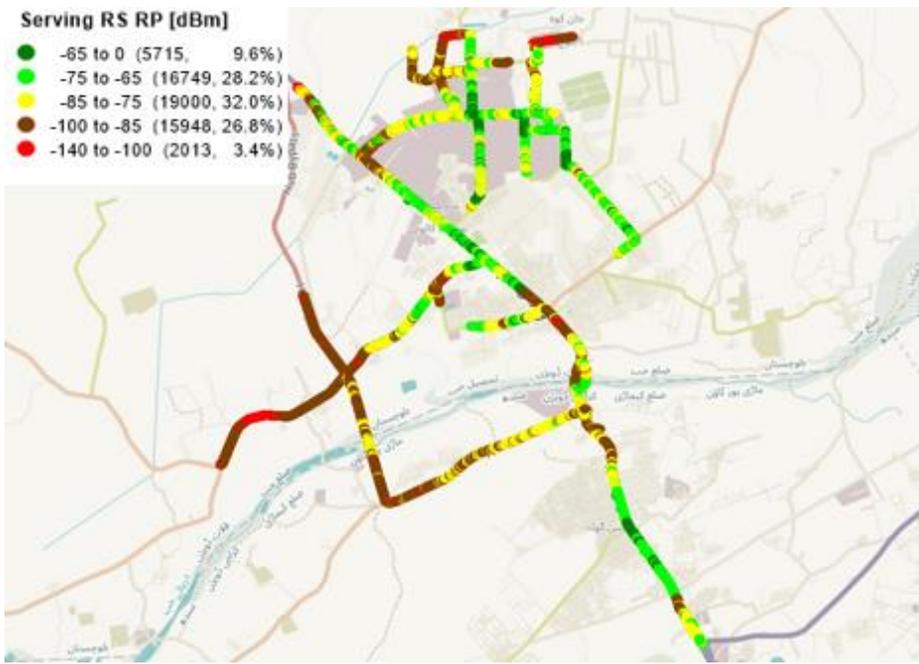
JAZZ NETWORK COVERAGE – HUB



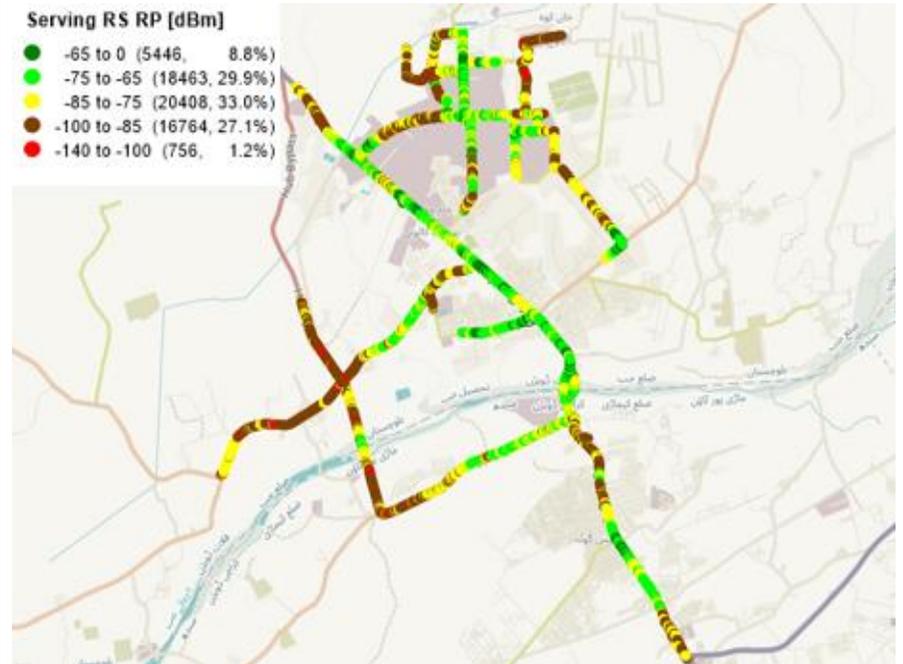
TELENOR NETWORK COVERAGE – HUB



UFONE NETWORK COVERAGE – HUB



ZONG NETWORK COVERAGE – HUB

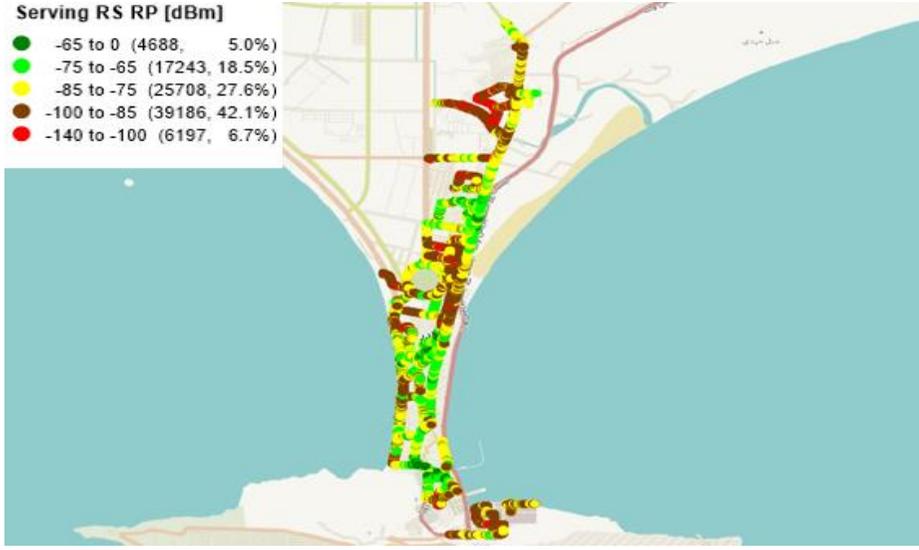


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – GWADAR

Serving RS RP [dBm]

- -65 to 0 (4688, 5.0%)
- -75 to -65 (17243, 18.5%)
- -85 to -75 (25708, 27.6%)
- -100 to -85 (39186, 42.1%)
- -140 to -100 (6197, 6.7%)



TELENOR NETWORK COVERAGE – GWADAR

Serving RS RP [dBm]

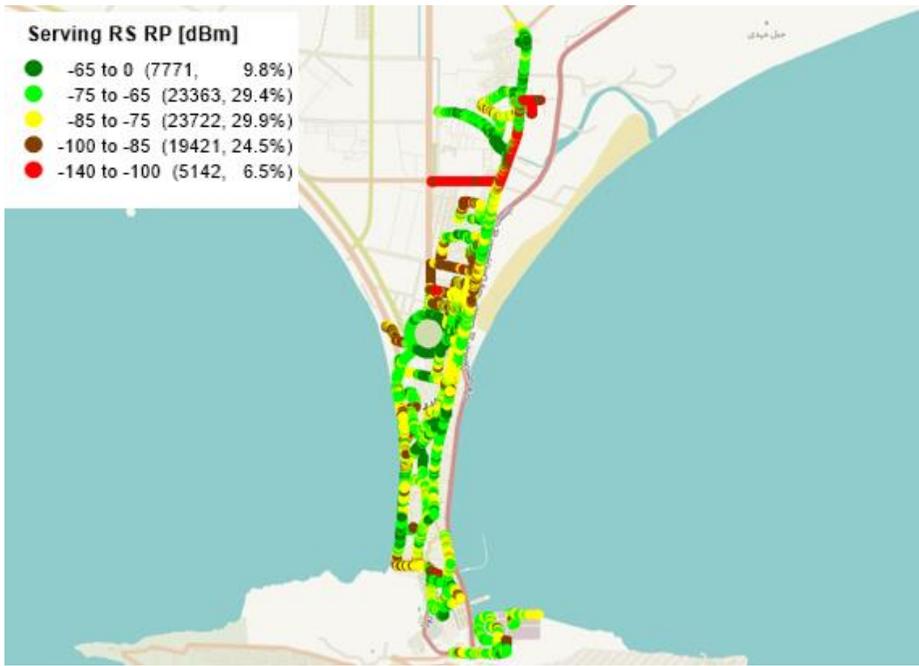
- -65 to 0 (747, 1.0%)
- -75 to -65 (5998, 8.3%)
- -85 to -75 (20168, 27.9%)
- -100 to -85 (30120, 41.7%)
- -140 to -100 (15263, 21.1%)



UFONE NETWORK COVERAGE – GWADAR

Serving RS RP [dBm]

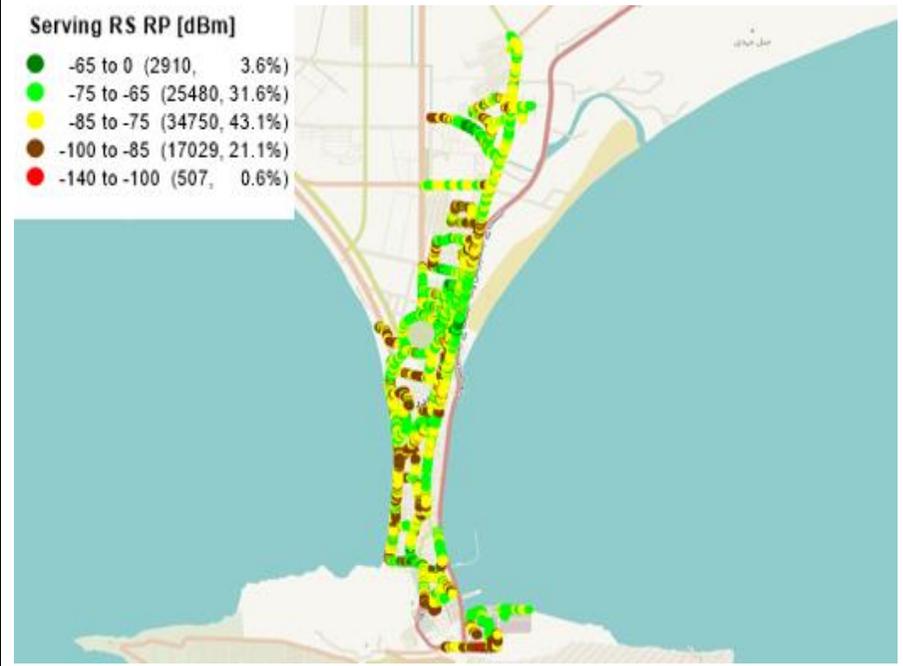
- -65 to 0 (7771, 9.8%)
- -75 to -65 (23363, 29.4%)
- -85 to -75 (23722, 29.9%)
- -100 to -85 (19421, 24.5%)
- -140 to -100 (5142, 6.5%)



ZONG NETWORK COVERAGE – GWADAR

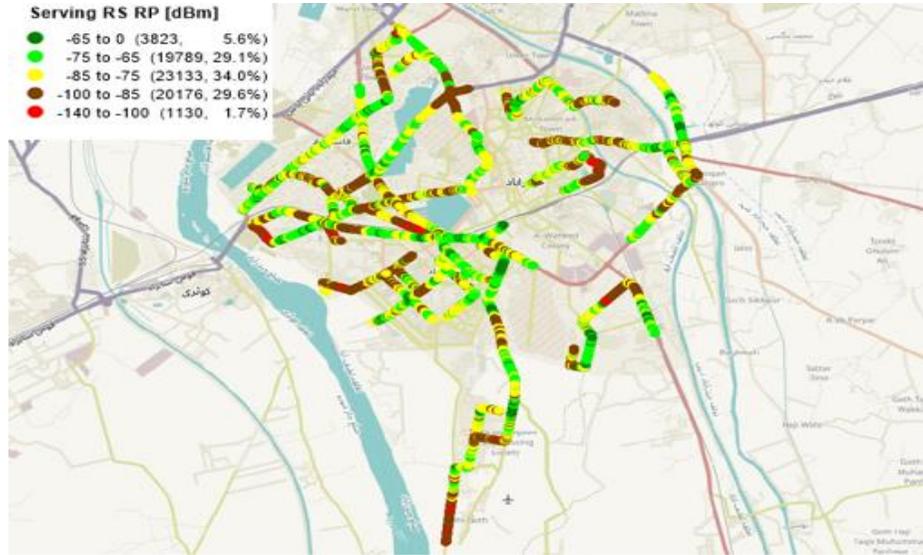
Serving RS RP [dBm]

- -65 to 0 (2910, 3.6%)
- -75 to -65 (25480, 31.6%)
- -85 to -75 (34750, 43.1%)
- -100 to -85 (17029, 21.1%)
- -140 to -100 (507, 0.6%)

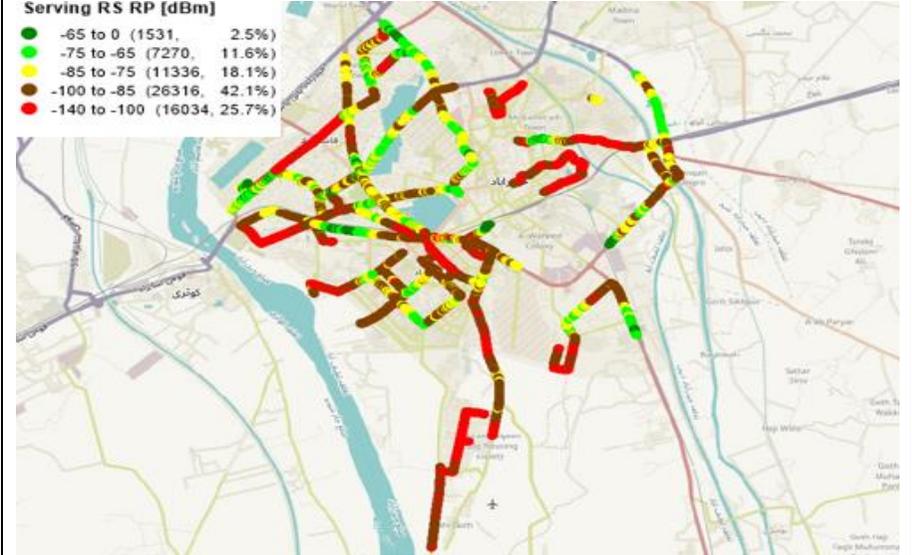


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

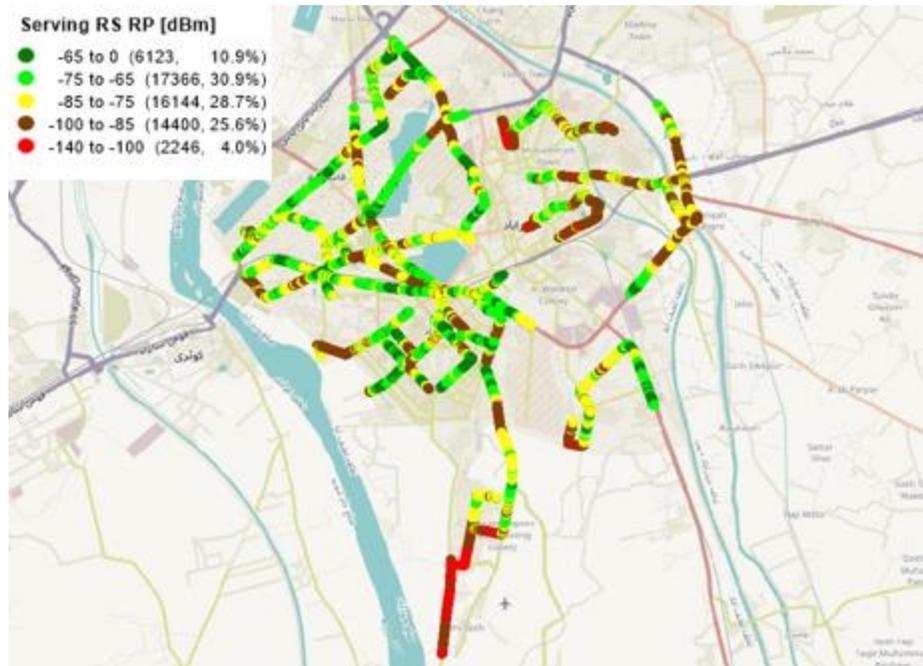
JAZZ NETWORK COVERAGE – HYDERABAD



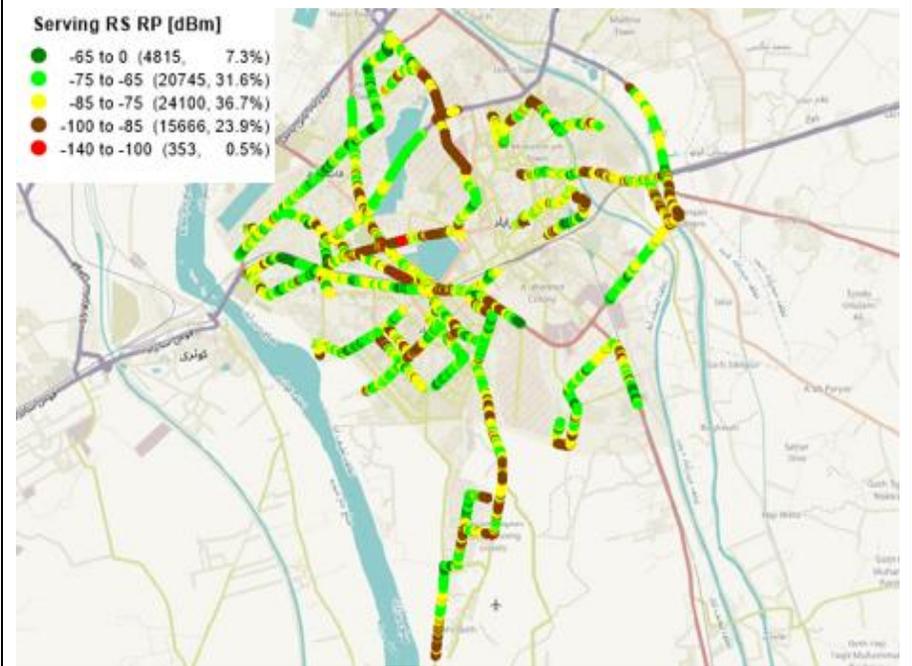
TELENOR NETWORK COVERAGE – HYDERABAD



UFONE NETWORK COVERAGE – HYDERABAD



ZONG NETWORK COVERAGE – HYDERABAD

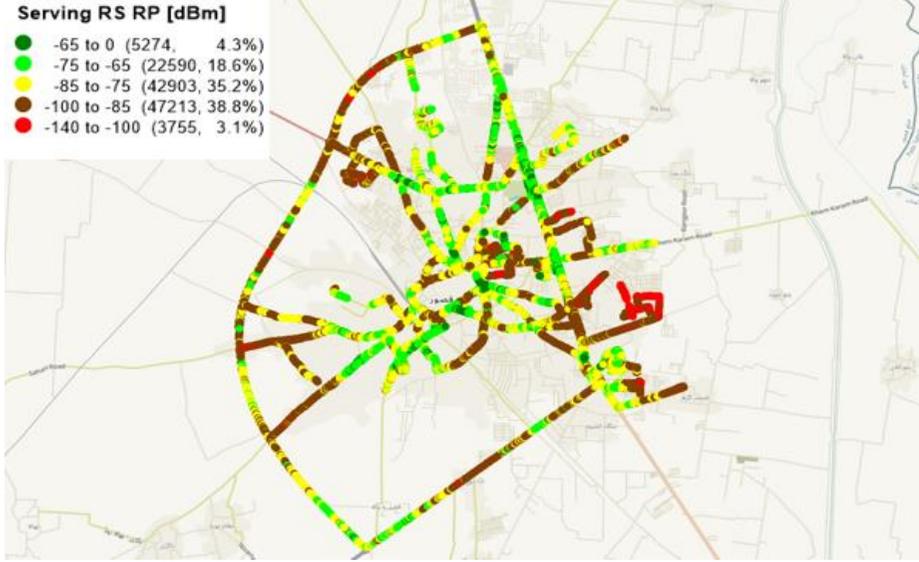


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – KASUR

Serving RS RP [dBm]

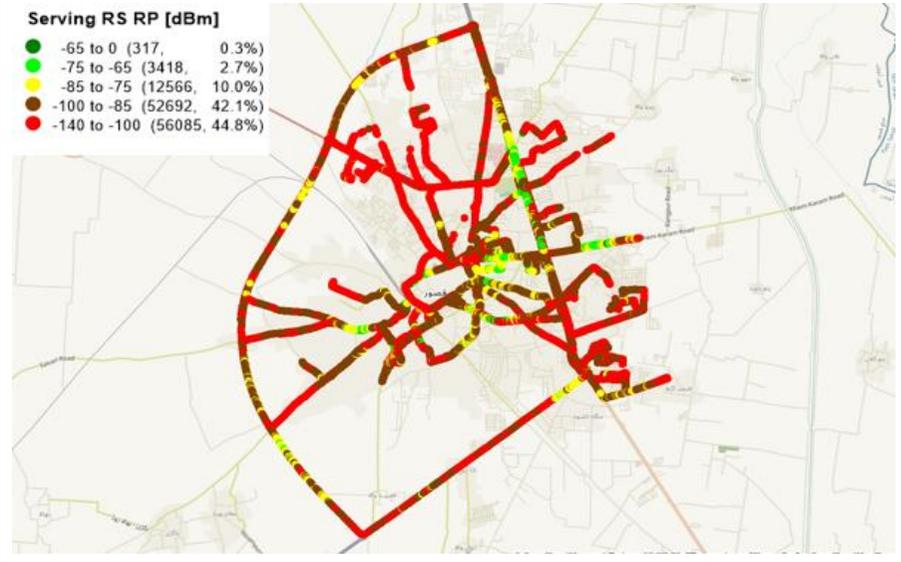
- -65 to 0 (5274, 4.3%)
- -75 to -65 (22590, 18.6%)
- -85 to -75 (42903, 35.2%)
- -100 to -85 (47213, 38.8%)
- -140 to -100 (3755, 3.1%)



TELENOR NETWORK COVERAGE – KASUR

Serving RS RP [dBm]

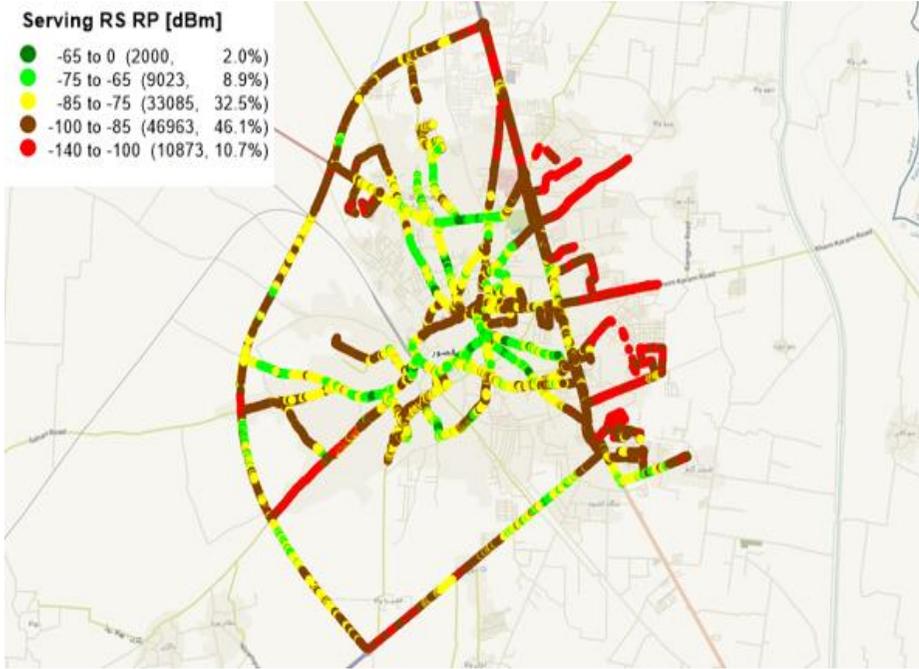
- -65 to 0 (317, 0.3%)
- -75 to -65 (3418, 2.7%)
- -85 to -75 (12566, 10.0%)
- -100 to -85 (52692, 42.1%)
- -140 to -100 (56085, 44.8%)



UFONE NETWORK COVERAGE – KASUR

Serving RS RP [dBm]

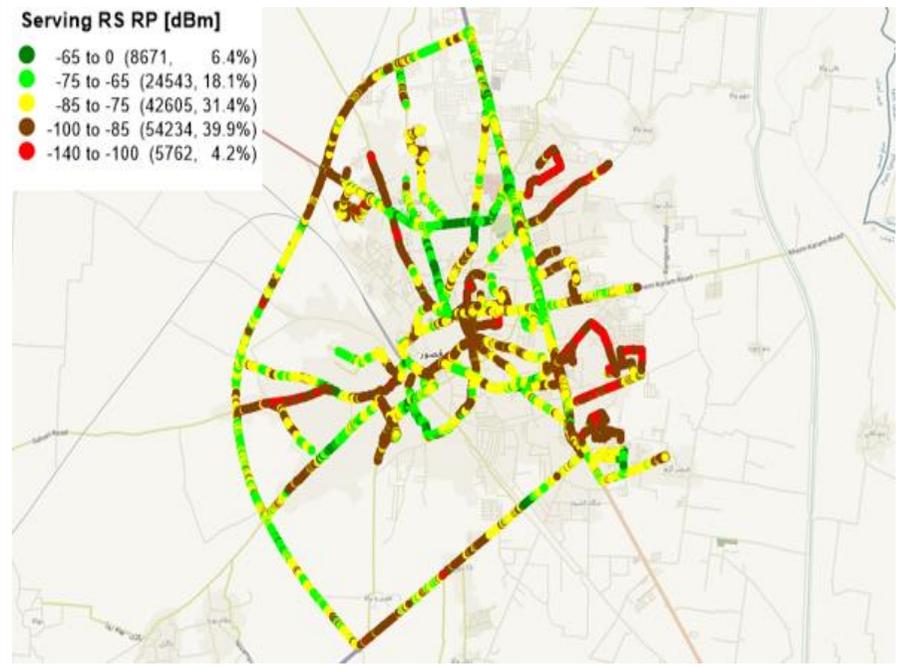
- -65 to 0 (2000, 2.0%)
- -75 to -65 (9023, 8.9%)
- -85 to -75 (33085, 32.5%)
- -100 to -85 (46963, 46.1%)
- -140 to -100 (10873, 10.7%)



ZONG NETWORK COVERAGE – KASUR

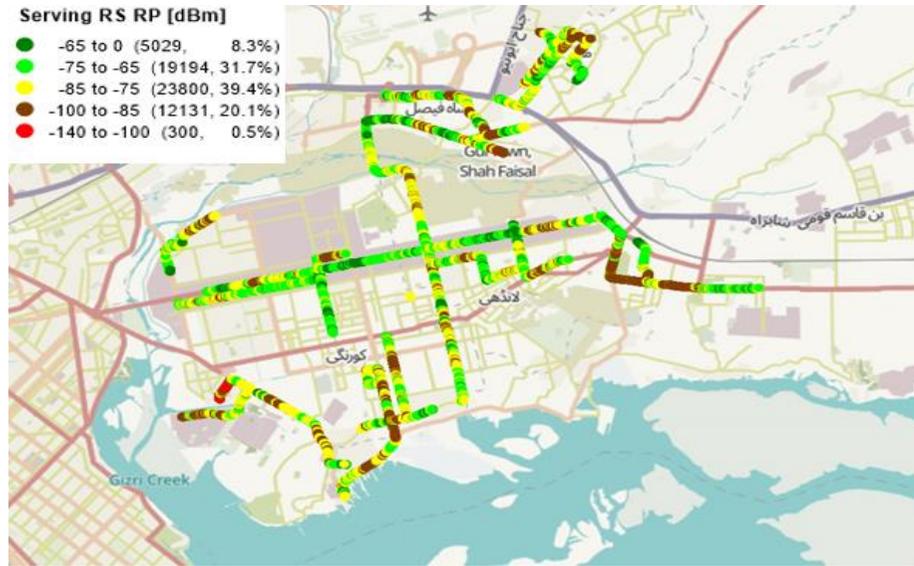
Serving RS RP [dBm]

- -65 to 0 (8671, 6.4%)
- -75 to -65 (24543, 18.1%)
- -85 to -75 (42605, 31.4%)
- -100 to -85 (54234, 39.9%)
- -140 to -100 (5762, 4.2%)

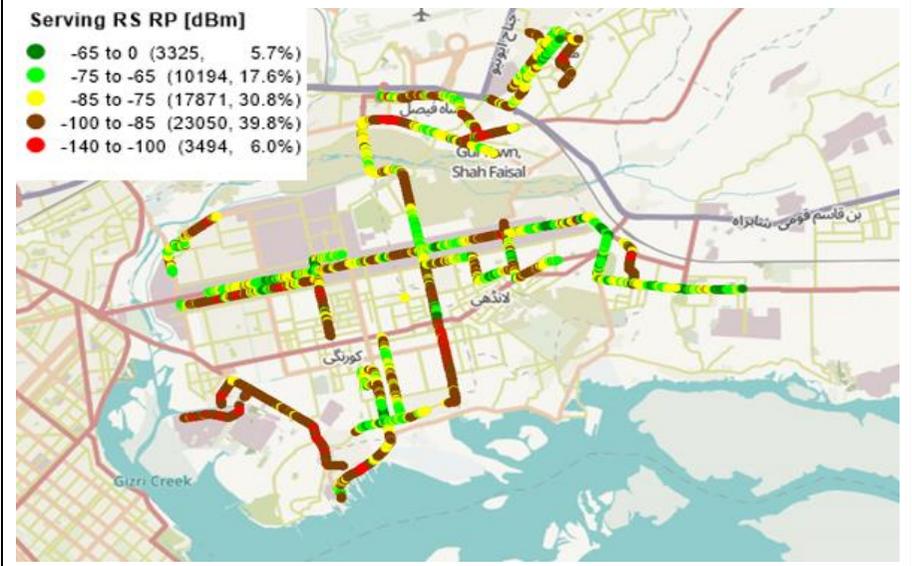


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – KORANGI



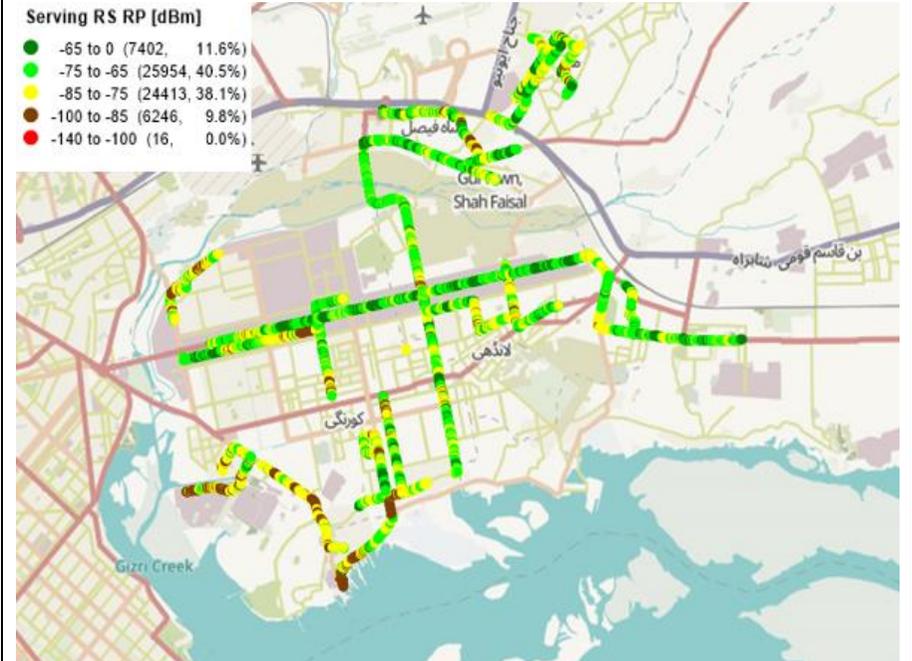
TELENOR NETWORK COVERAGE – KORANGI



UFONE NETWORK COVERAGE – KORANGI

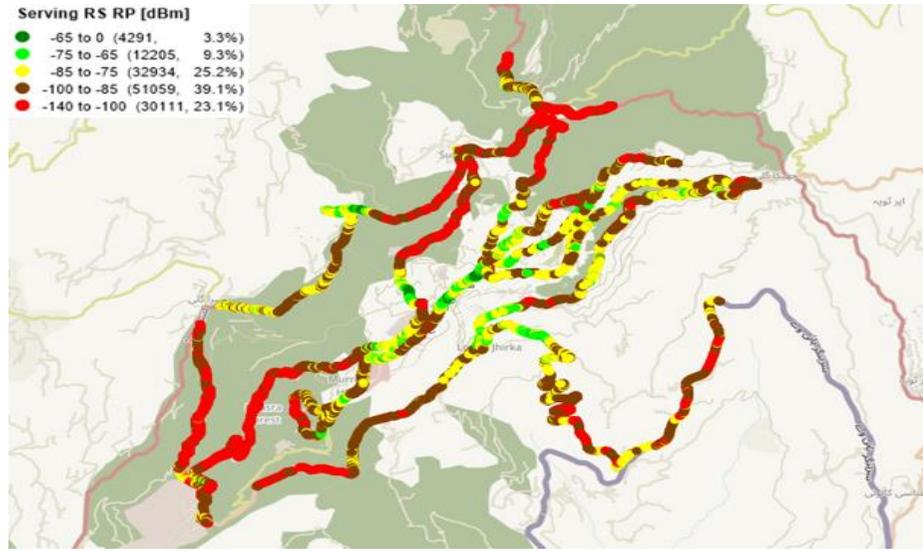


ZONG NETWORK COVERAGE – KORANGI

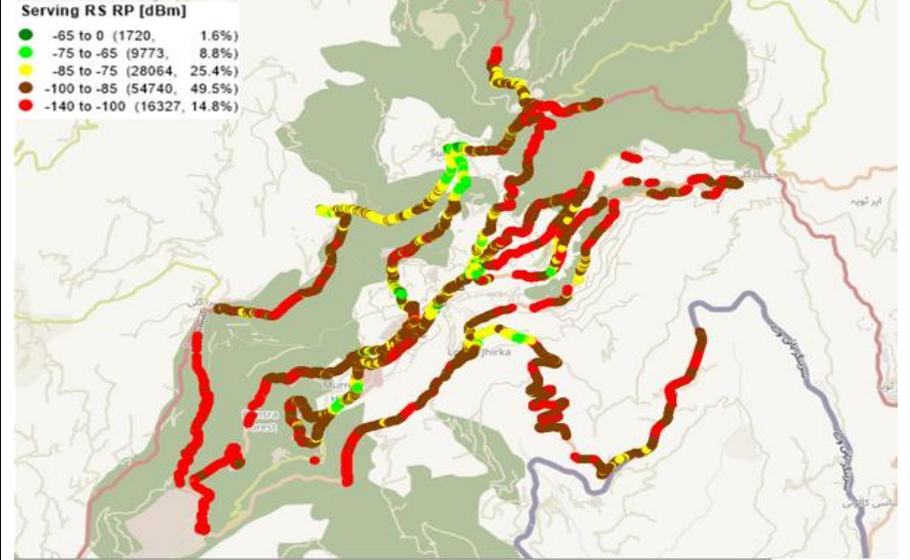


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

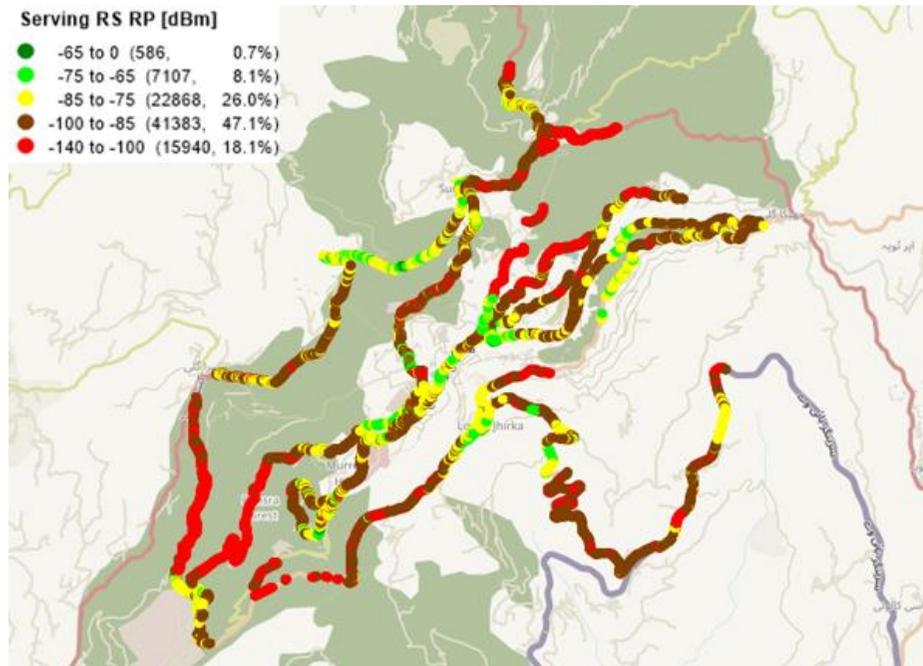
JAZZ NETWORK COVERAGE – MURREE



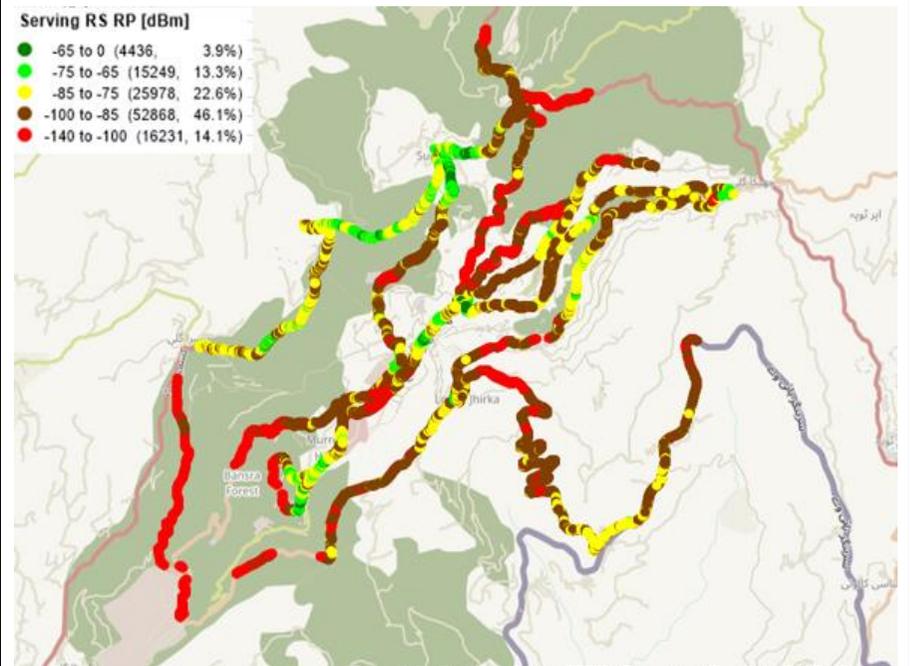
TELENOR NETWORK COVERAGE – MURREE



UFONE NETWORK COVERAGE – MURREE

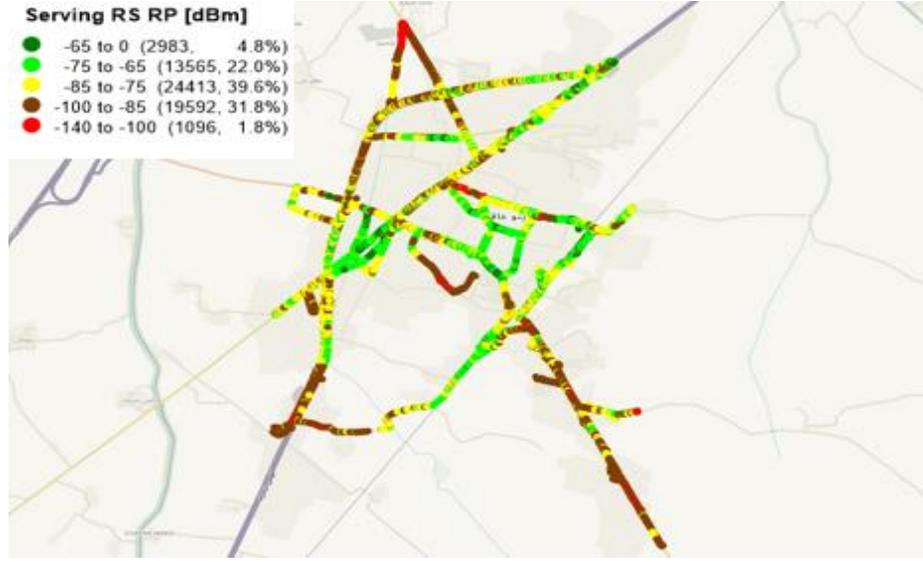


ZONG NETWORK COVERAGE – MURREE

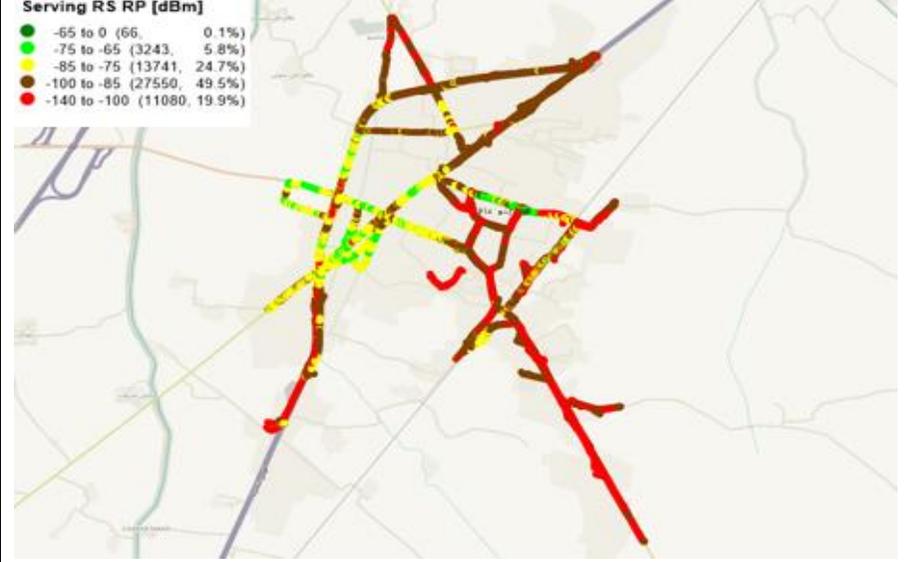


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

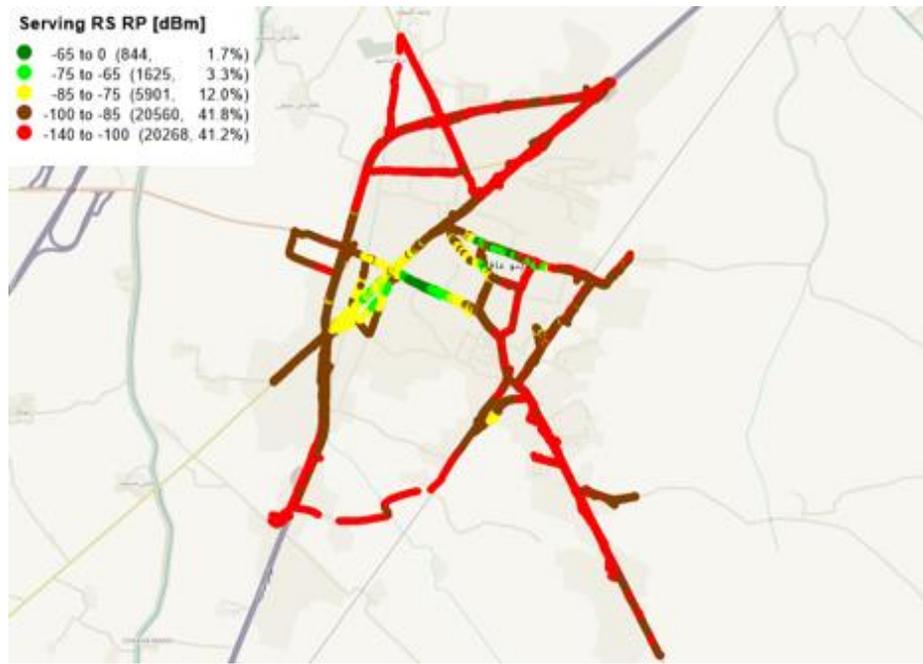
JAZZ NETWORK COVERAGE – PANO AQIL



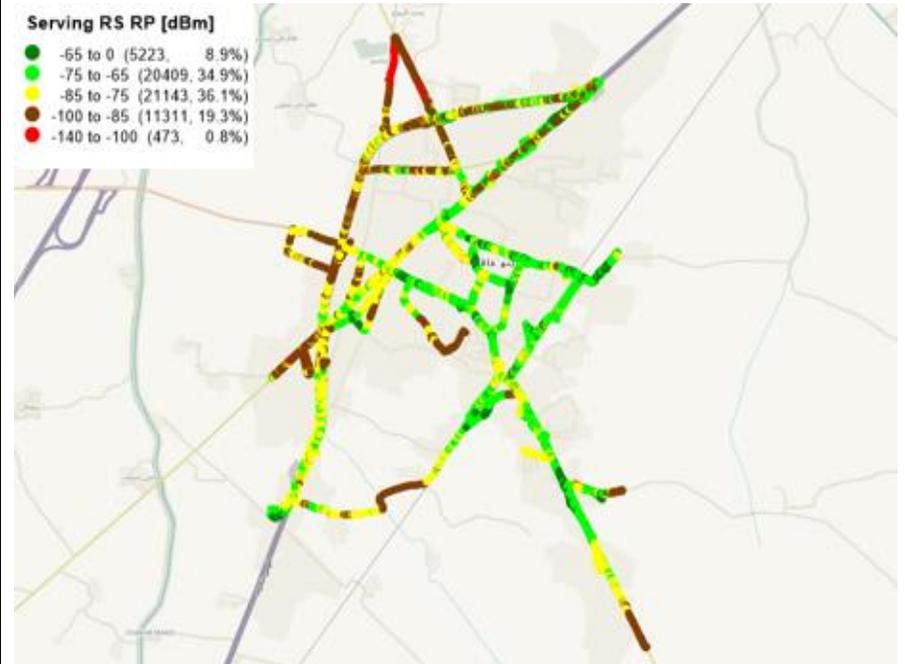
TELENOR NETWORK COVERAGE – PANO AQIL



UFONE NETWORK COVERAGE – PANO AQIL

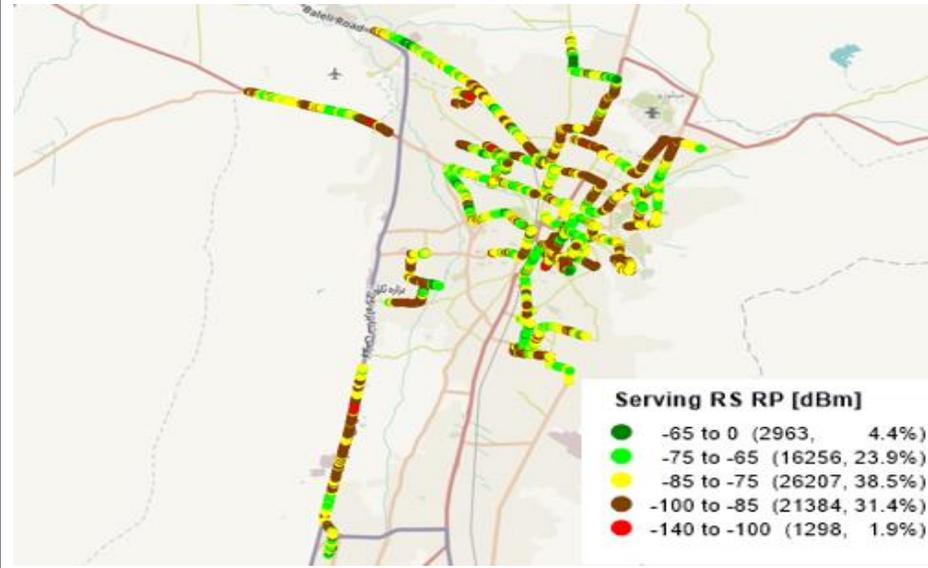


ZONG NETWORK COVERAGE – PANO AQIL

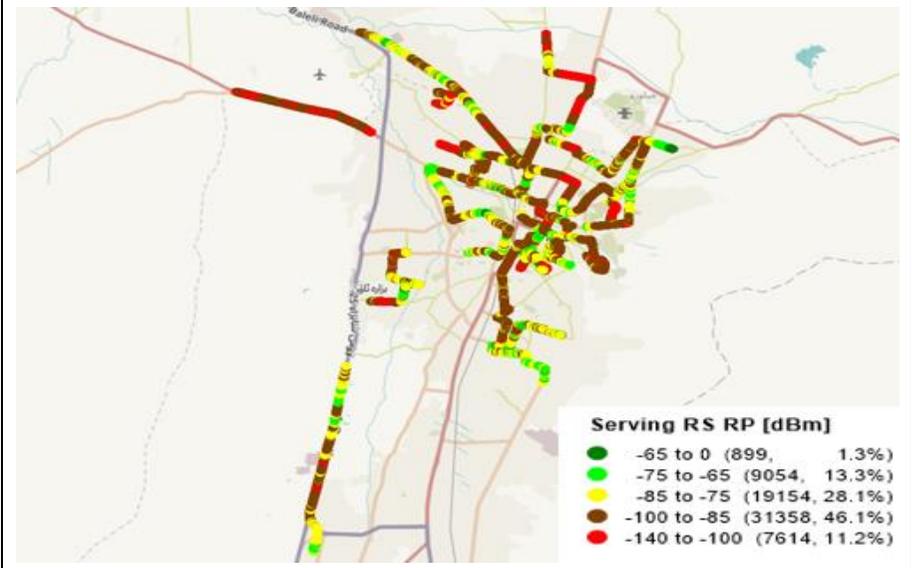


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

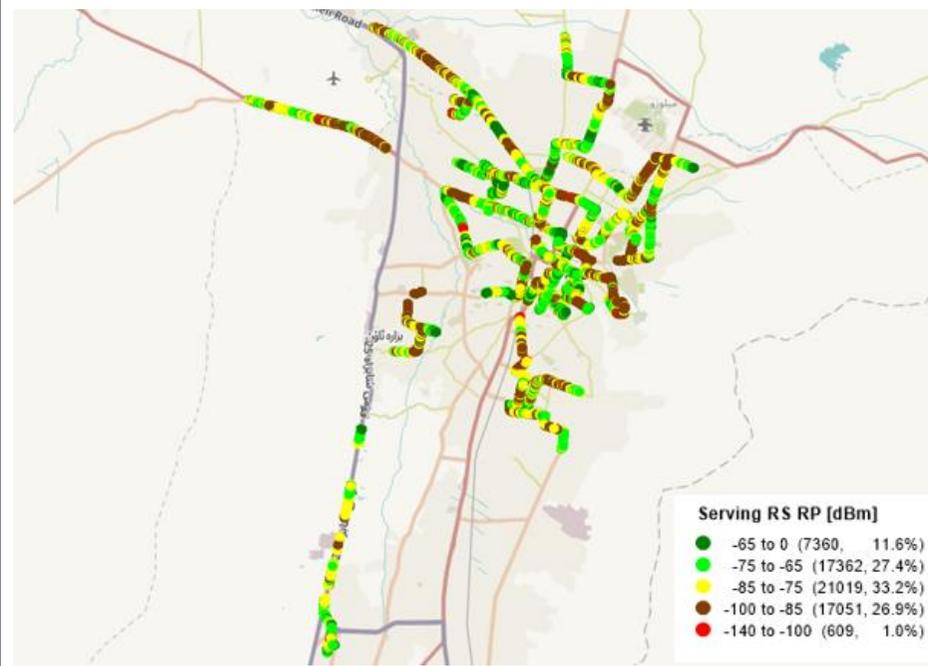
JAZZ NETWORK COVERAGE – QUETTA



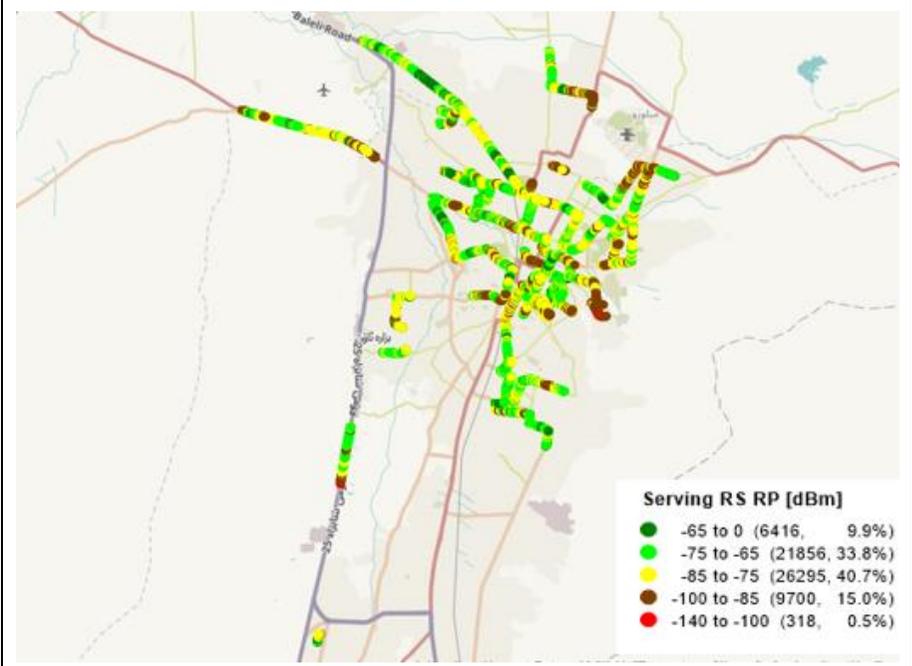
TELENOR NETWORK COVERAGE – QUETTA



UFONE NETWORK COVERAGE – QUETTA

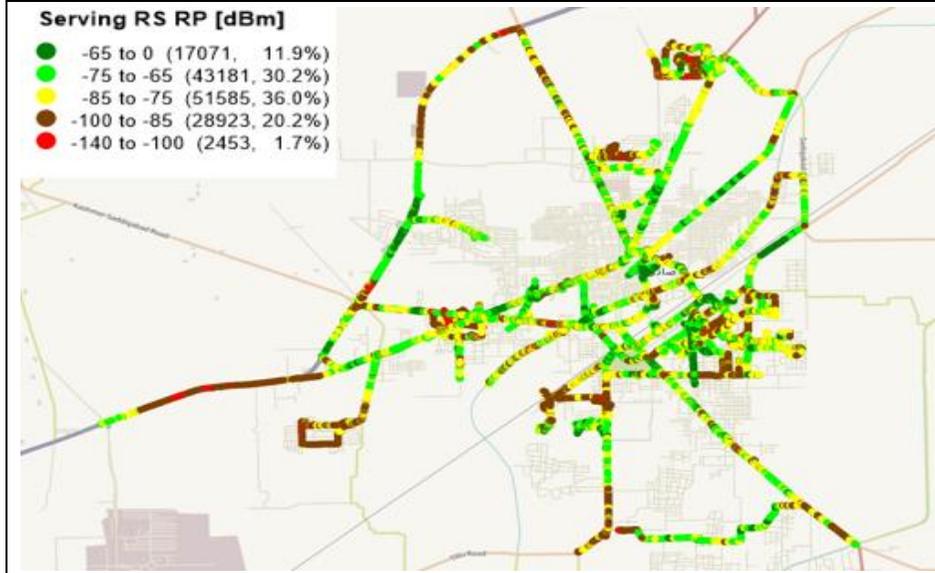


ZONG NETWORK COVERAGE – QUETTA

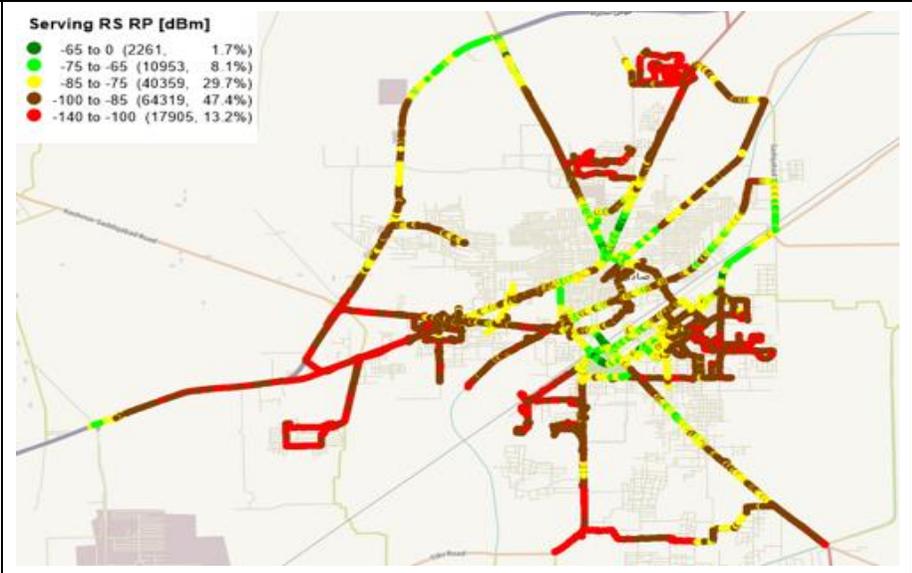


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

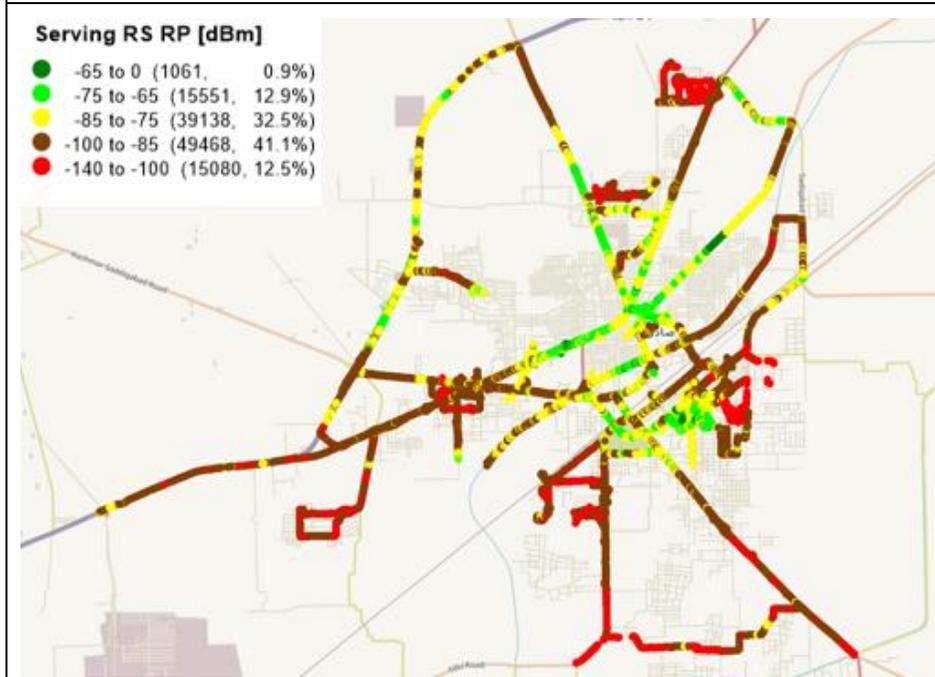
JAZZ NETWORK COVERAGE – SADIQABAD



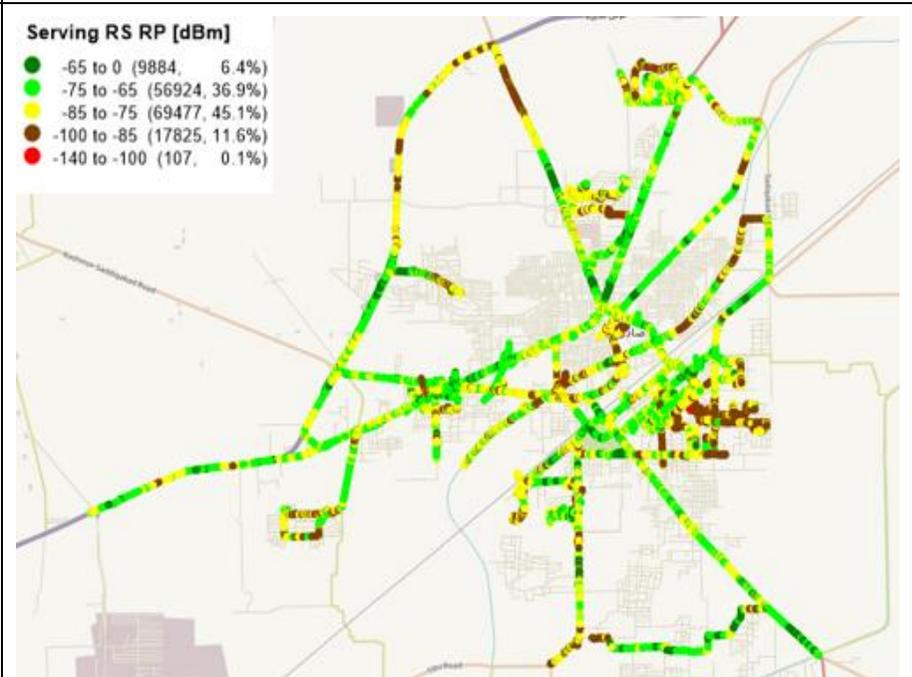
TELENOR NETWORK COVERAGE – SADIQABAD



UFONE NETWORK COVERAGE – SADIQABAD



ZONG NETWORK COVERAGE – SADIQABAD

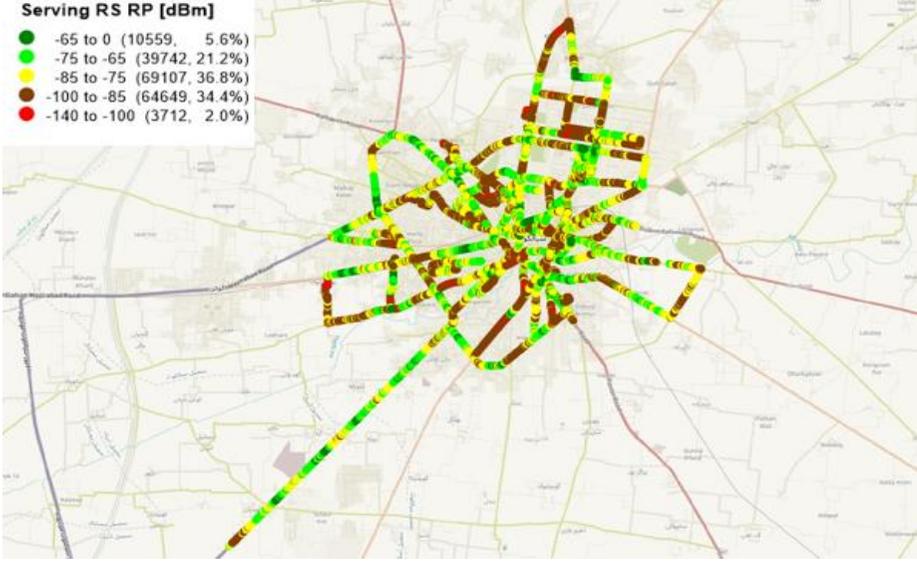


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

JAZZ NETWORK COVERAGE – SIALKOT

Serving RS RP [dBm]

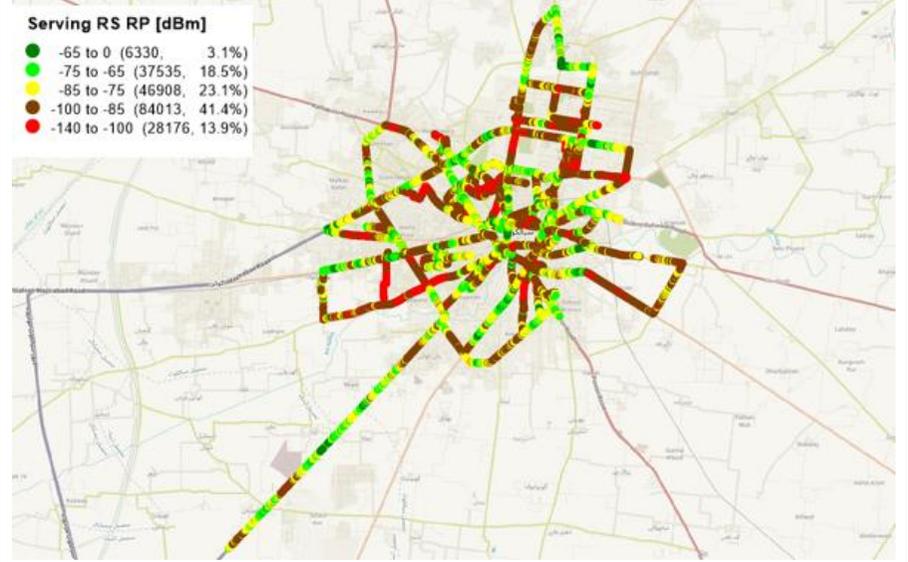
- 65 to 0 (10559, 5.6%)
- 75 to -65 (39742, 21.2%)
- 85 to -75 (69107, 36.8%)
- 100 to -85 (64649, 34.4%)
- 140 to -100 (3712, 2.0%)



TELENOR NETWORK COVERAGE – SIALKOT

Serving RS RP [dBm]

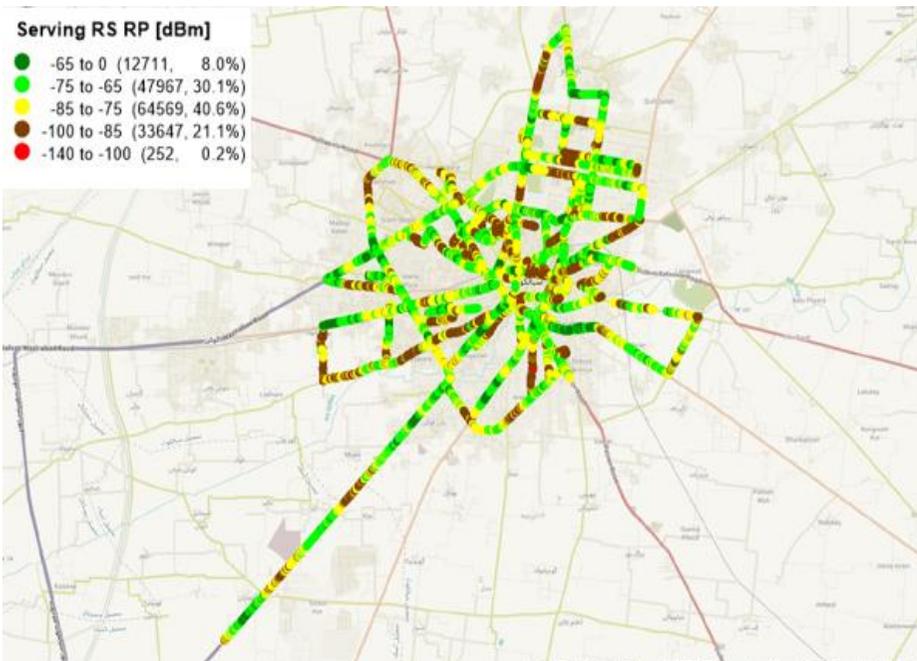
- 65 to 0 (6330, 3.1%)
- 75 to -65 (37535, 18.5%)
- 85 to -75 (46908, 23.1%)
- 100 to -85 (84013, 41.4%)
- 140 to -100 (28176, 13.9%)



UFONE NETWORK COVERAGE – SIALKOT

Serving RS RP [dBm]

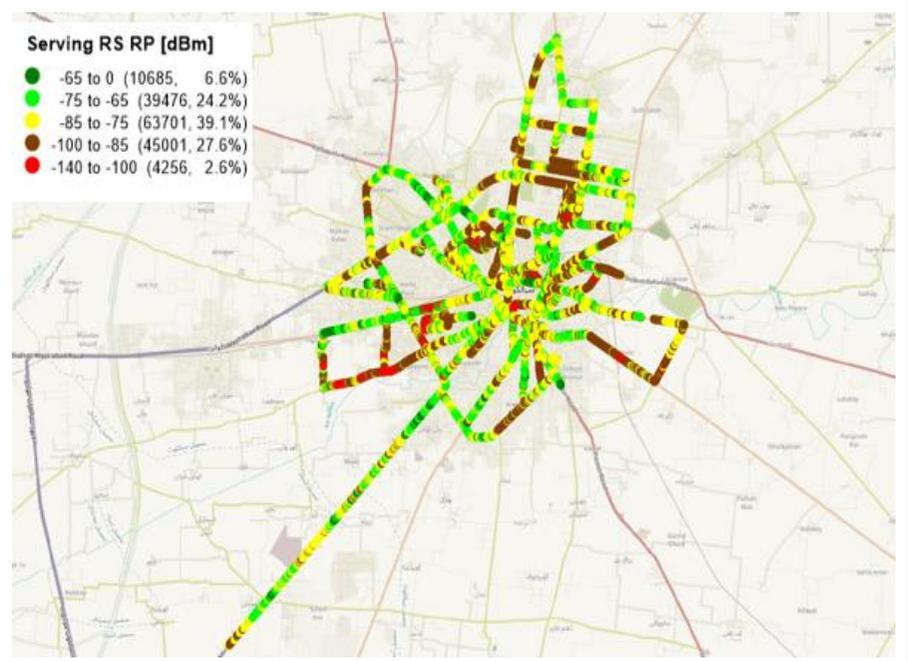
- 65 to 0 (12711, 8.0%)
- 75 to -65 (47967, 30.1%)
- 85 to -75 (64569, 40.6%)
- 100 to -85 (33647, 21.1%)
- 140 to -100 (252, 0.2%)



ZONG NETWORK COVERAGE – SIALKOT

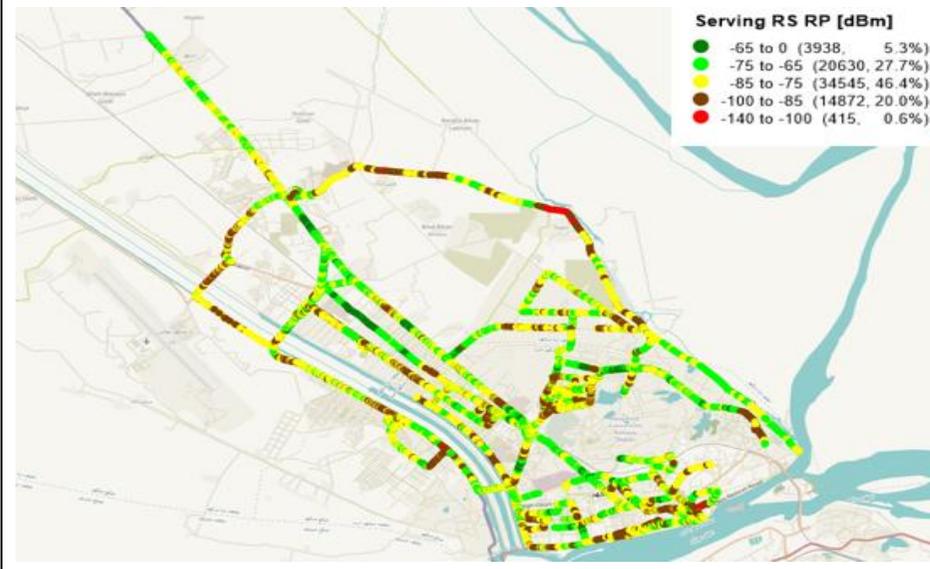
Serving RS RP [dBm]

- 65 to 0 (10685, 6.6%)
- 75 to -65 (39476, 24.2%)
- 85 to -75 (63701, 39.1%)
- 100 to -85 (45001, 27.6%)
- 140 to -100 (4256, 2.6%)

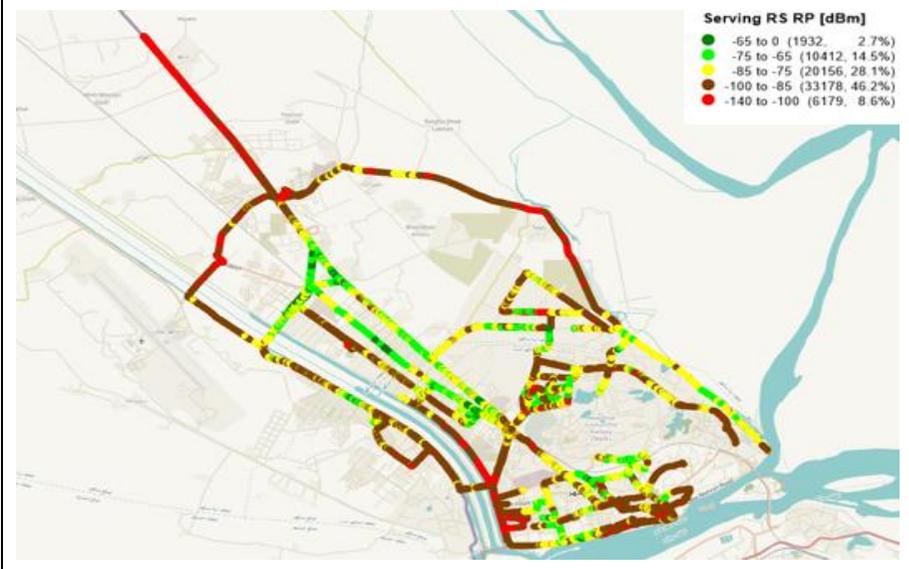


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

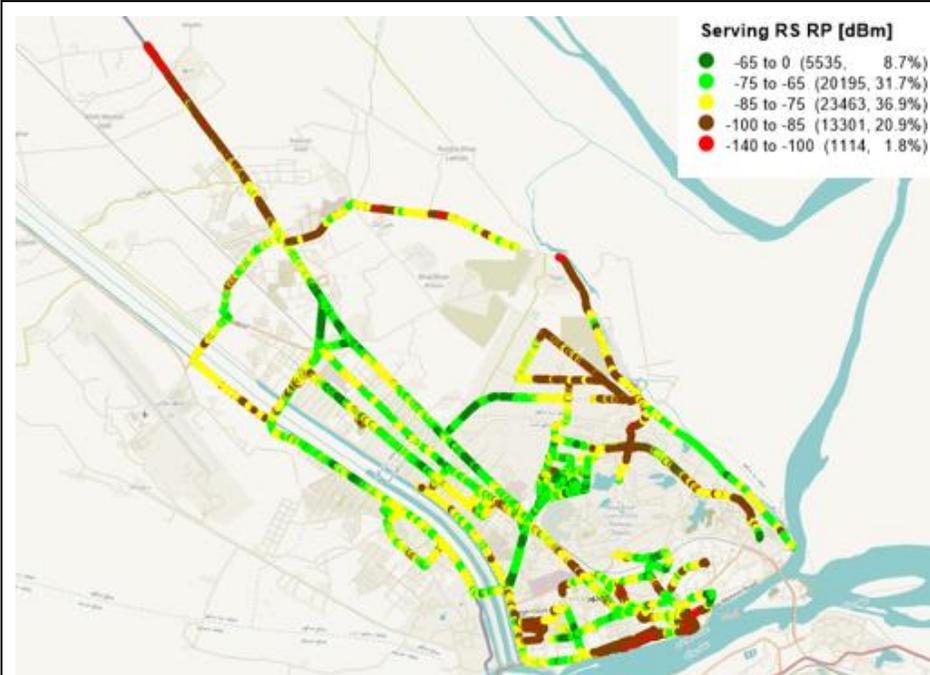
JAZZ NETWORK COVERAGE – SUKKUR



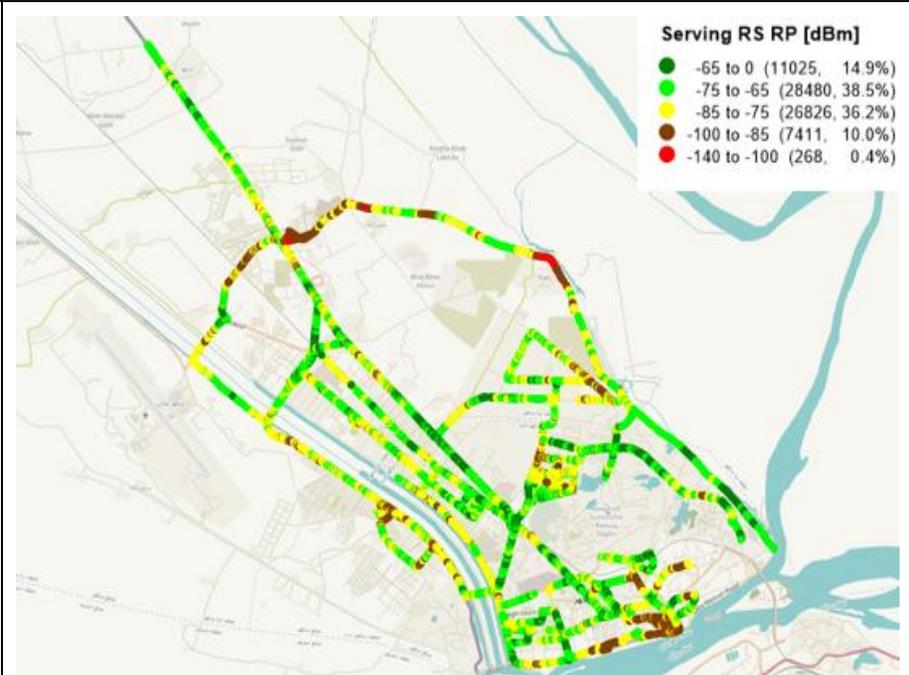
TELENOR NETWORK COVERAGE – SUKKUR



UFONE NETWORK COVERAGE – SUKKUR

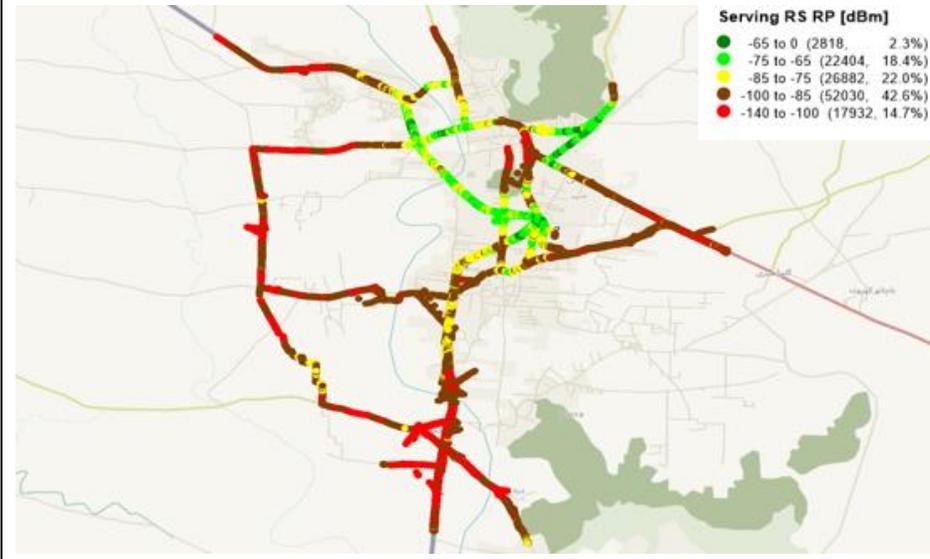


ZONG NETWORK COVERAGE – SUKKUR

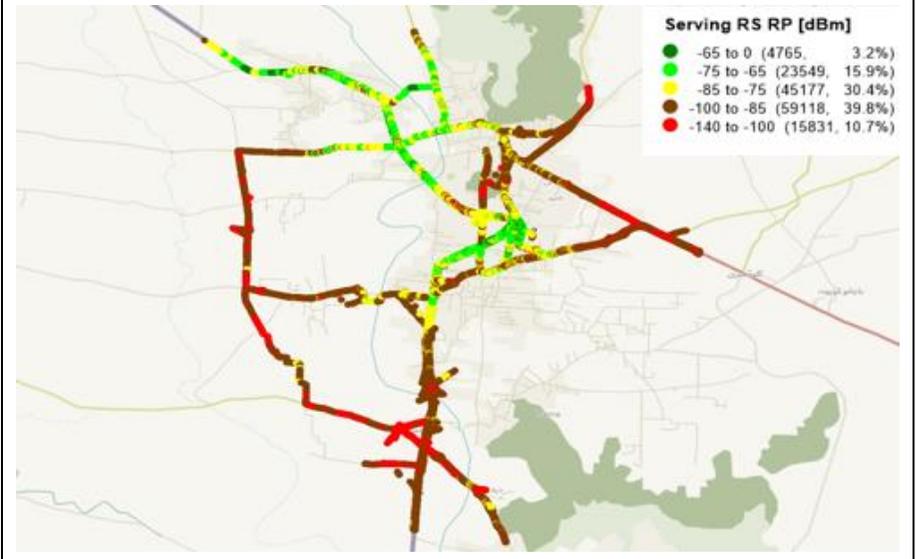


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

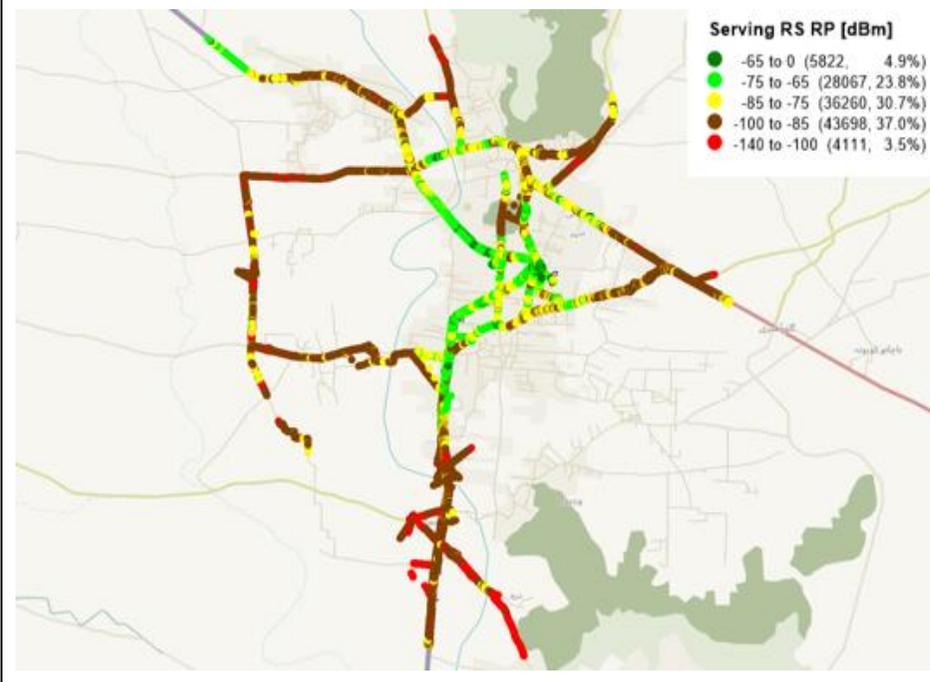
JAZZ NETWORK COVERAGE – SWABI



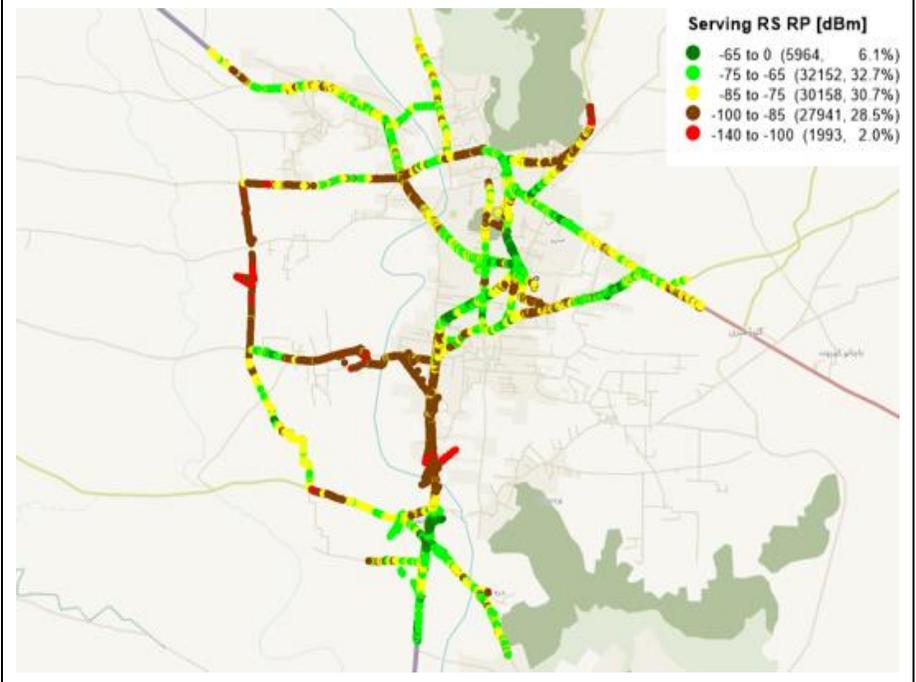
TELENOR NETWORK COVERAGE – SWABI



UFONE NETWORK COVERAGE – SWABI



ZONG NETWORK COVERAGE – SWABI



AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

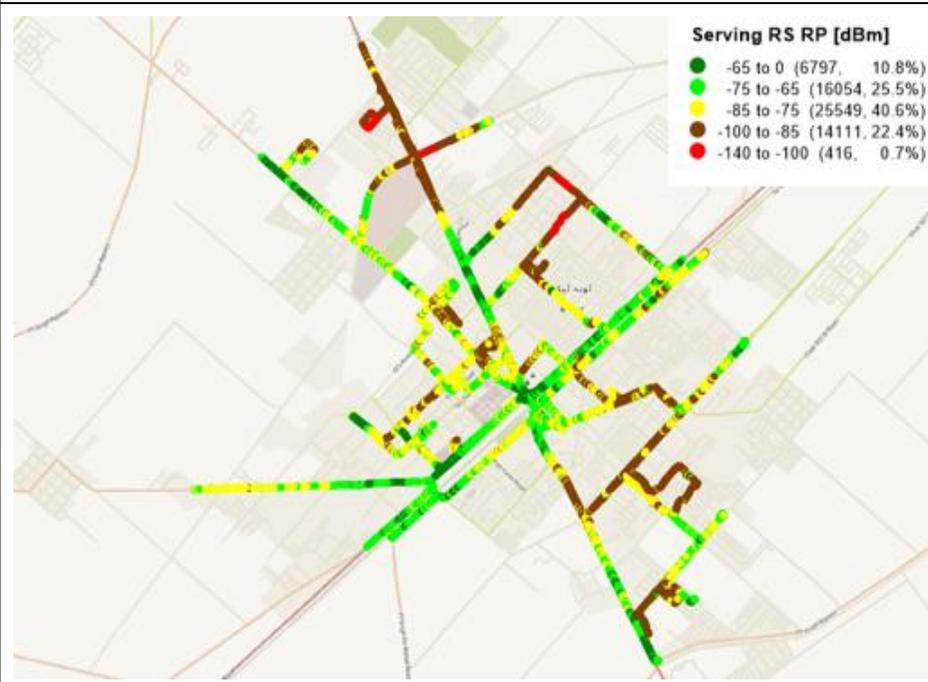
JAZZ NETWORK COVERAGE – TOBA TEK SINGH



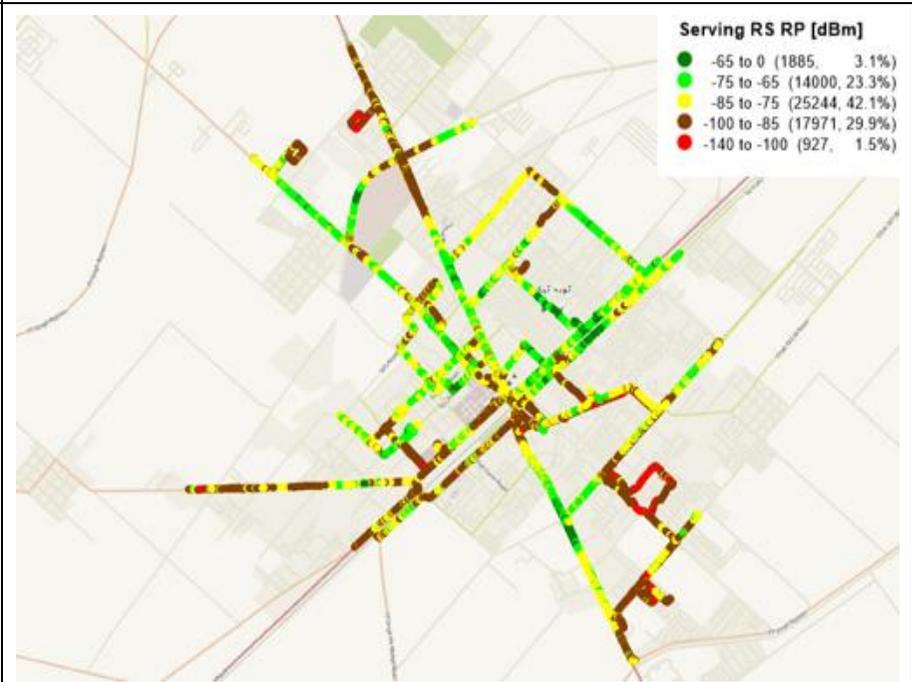
TELENOR NETWORK COVERAGE – TOBA TEK SINGH



UFONE NETWORK COVERAGE – TOBA TEK SINGH



ZONG NETWORK COVERAGE – TOBA TEK SINGH

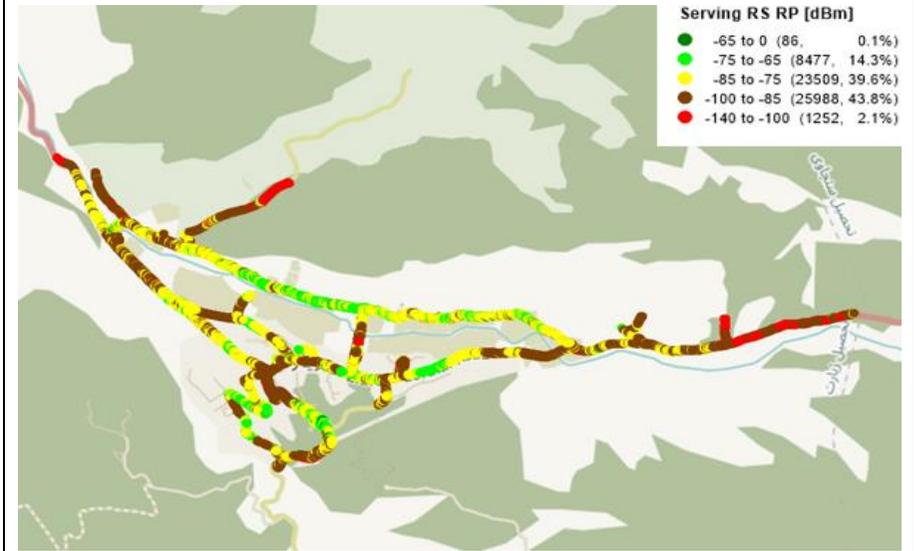


AUTOMODE MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

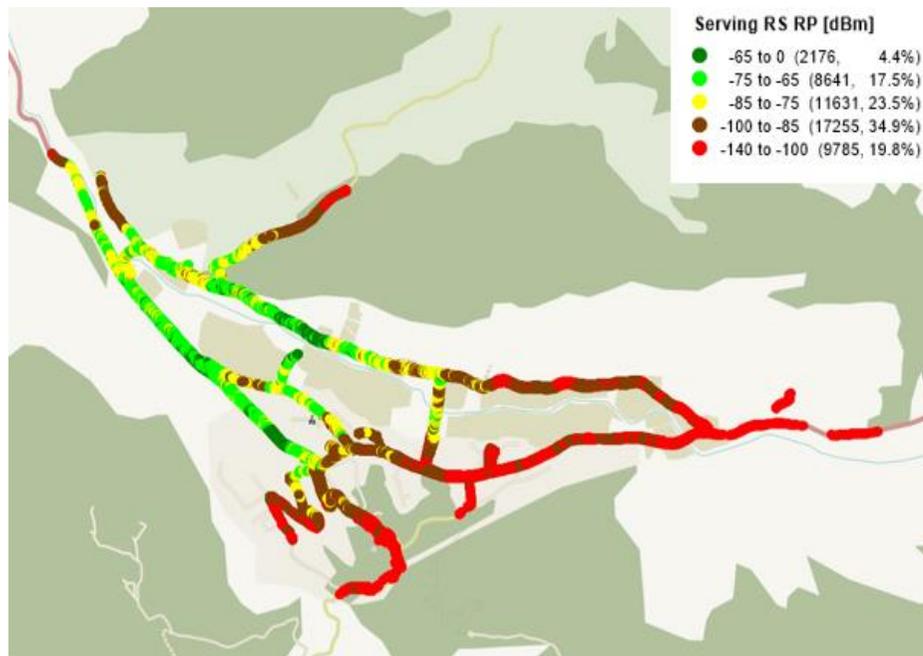
JAZZ NETWORK COVERAGE – ZIARAT

N/A

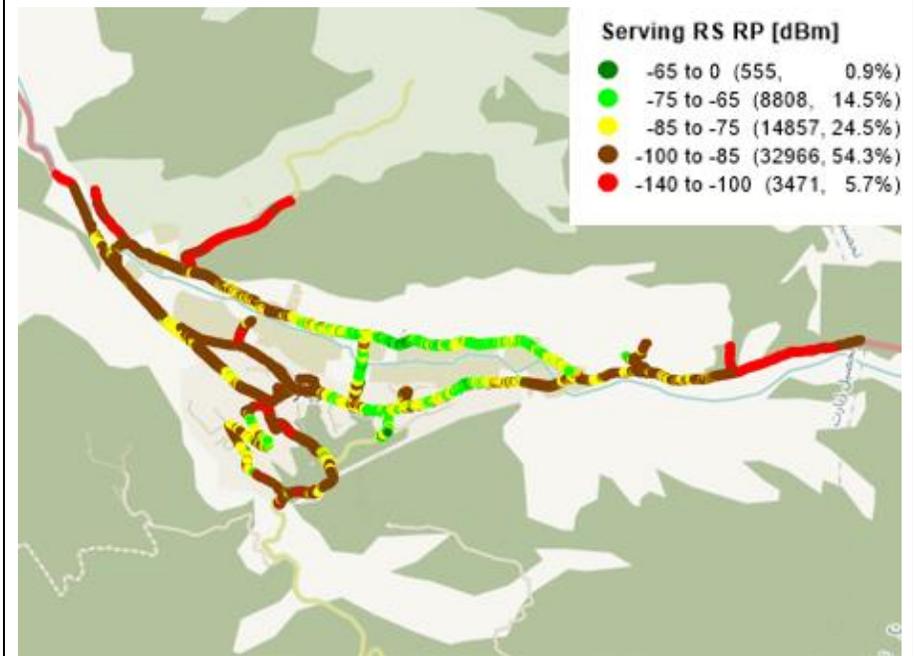
TELENOR NETWORK COVERAGE – ZIARAT



UFONE NETWORK COVERAGE – ZIARAT



ZONG NETWORK COVERAGE – ZIARAT



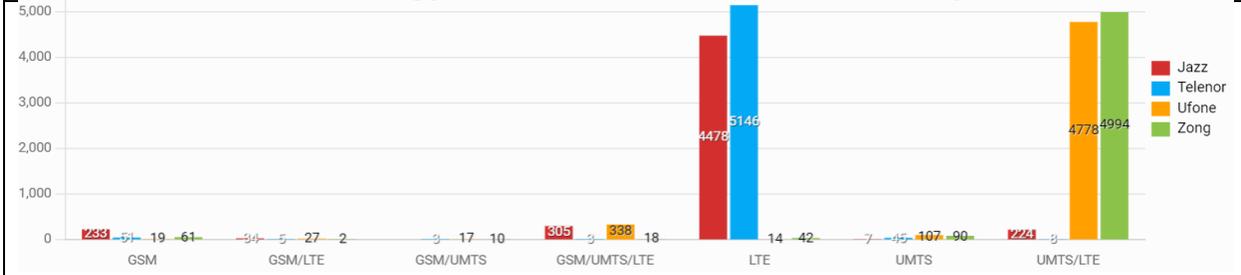
AUTOMODE

Mobile Broadband Services

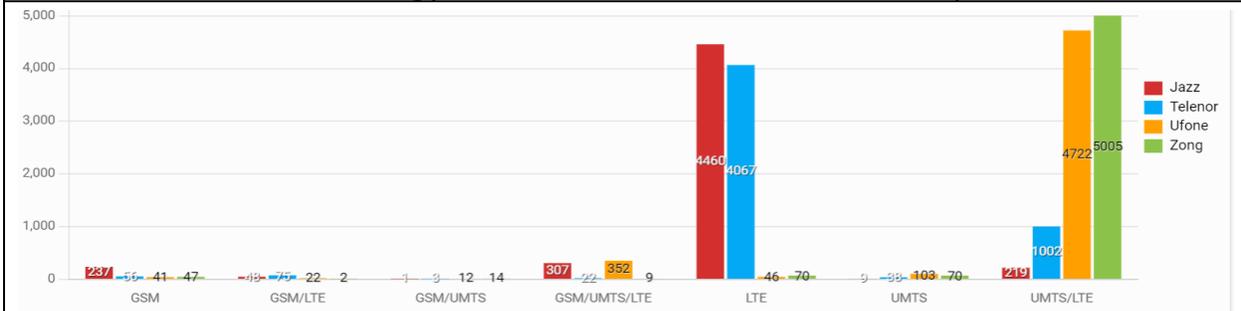


Voice Services

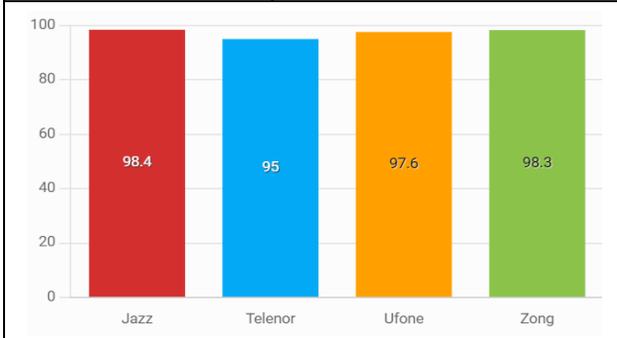
Technology Wise Distribution of Calls – A Party



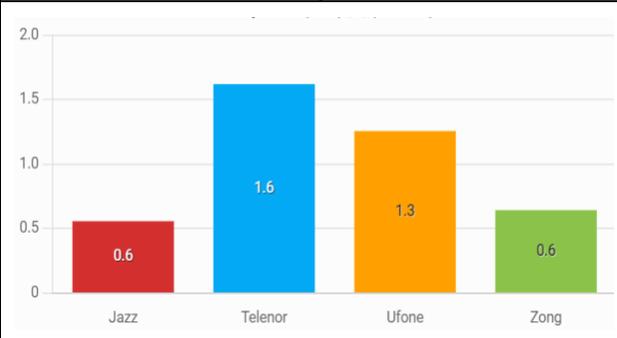
Technology Wise Distribution of Calls – B Party



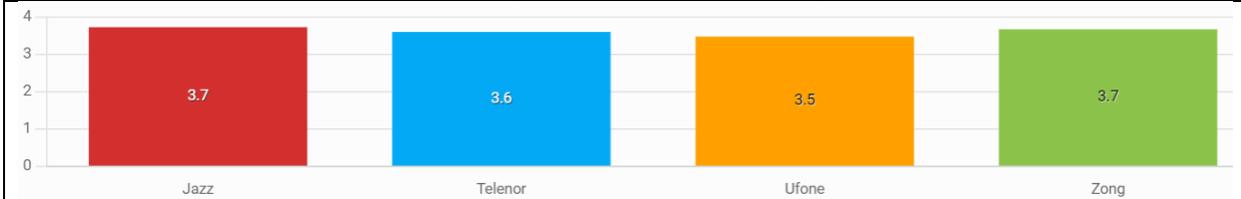
Call Setup Success Rate



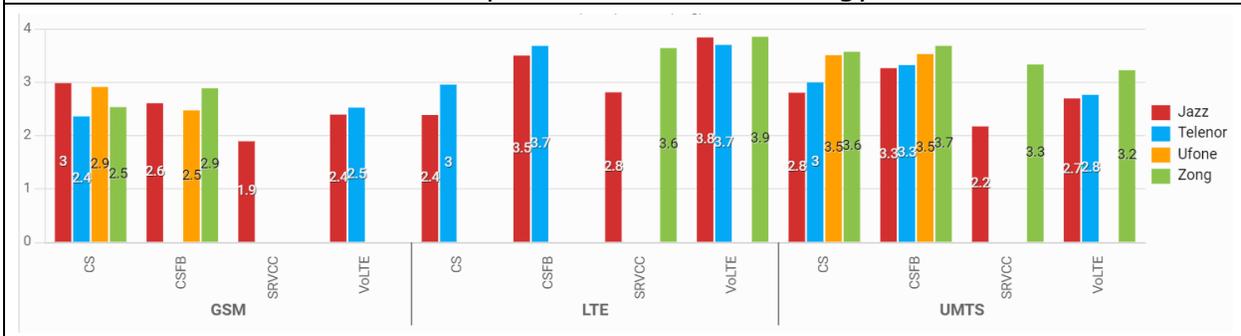
Call Drop Ratio



Mean Opinion Score - Average



Mean Opinion Score – Technology



SMS Services

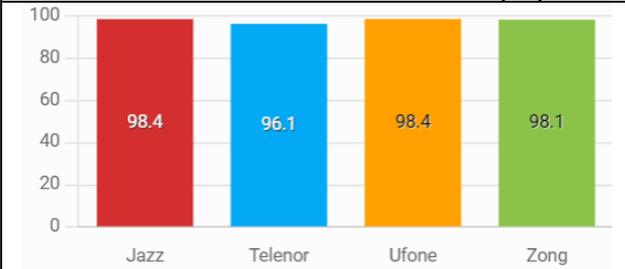
SMS SEND REQUEST BY TECHNOLOGY



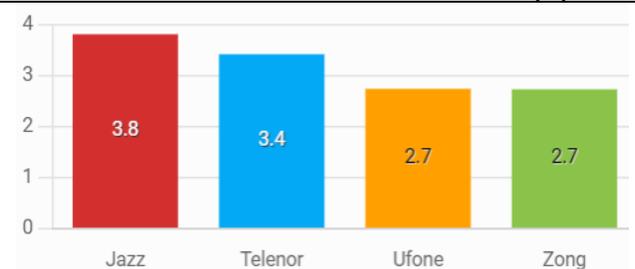
SMS SUCCESSFUL RECEPTION BY TECHNOLOGY



SMS RECEIVE SUCCESS RATE (%)



SMS END TO END DELIVERY TIME(S)



SMS DELIVERY DURATION BY TECHNOLOGY

