

INDEPENDENT QUALITY OF SERVICE SURVEY REPORT

INTRODUCTION

1.1. In order to measure the performance and service quality of Cellular Mobile Operators (CMOs), an independent Quality of Service (QoS) Survey has been carried out in Eleven (11) x cities of Punjab, Sindh, Khyber Pakhtunkhwa (KPK) and Balochistan during 1st quarter i.e. January ~ March 2022. The name of cities along with survey dates are mentioned in **Table 1.1: QoS Survey Cities & Dates:**

S. #.	Province	City	Days	Survey Dates
1.	Punjab	Sadiqabad	2	08 ~ 09 February 2022
2.		Kharian	2	14 ~ 15 February 2022
3.		Khanpur	3	14 ~ 16 February 2022
4.		Sialkot	2	07 ~ 08 March 2022
5.		Wazirabad	2	16 ~ 17 March 2022
6.	Sindh	Kotri	3	08 ~ 10 February 2022
7.		Jacobabad	3	15 ~ 17 February 2022
8.		Dadu	3	18,22 & 23 February 2022
9.		Tando Allah Yar	2	22 ~ 23 March 2022
10.	Khyber Pakhtunkhwa	Dera Ismail Khan	3	21 ~ 23 February 2022
11.	Balochistan	Gwadar	4	07 ~ 10 March 2022

Table 1.1: QoS Survey Dates and Samples

DRIVE TEST DETAILS

2.1. The QoS survey was carried out using Automated QoS Monitoring & Benchmarking Tool i.e. "SMARTBENCHMARKER". Drive test teams selected survey routes in such a manner to cover main roads, service roads and majority of sectors/colonies. During the survey, mobile handsets for Voice Calls, SMS and Data Sessions, were kept in auto detect mode.

MOBILE NETWORK COVERAGE

3.1. **4G / LTE SIGNAL STRENGTH.** During the survey, while conducting data test in auto mode, 4G/LTE signal strength samples were recorded on survey routes. As per Next Generation Mobile Service (NGMS) licenses awarded, licensees are required to meet the threshold of -100dBm or above of Reference Signal Receive Power (RSRP) with 90% confidence level. The Confidence Level and Compliance of signal strength is shown in **Table 3.1: 4G Signal Strength -100dBm with 90% Confidence Level**.

4G Signal Strength -100dBm with 90% Confidence Level								
City	Confidence Level				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Khanpur</i>	98.59%	95.37%	66.74%	99.94%	Yes	Yes	No	Yes
<i>Sadiqabad</i>	99.81%	96.50%	73.40%	99.88%	Yes	Yes	No	Yes
<i>Kharian</i>	96.57%	88.68%	84.02%	92.24%	Yes	No	No	Yes
<i>Wazirabad</i>	99.55%	88.65%	95.91%	96.30%	Yes	No	Yes	Yes
<i>Kotri</i>	98.47%	97.42%	63.19%	98.65%	Yes	Yes	No	Yes
<i>Jacobabad</i>	96.88%	88.82%	94.73%	98.91%	Yes	No	Yes	Yes
<i>Dadu</i>	94.53%	93.22%	53.98%	99.90%	Yes	Yes	No	Yes
<i>Tando Allah Yar</i>	98.75%	95.31%	80.18%	99.31%	Yes	Yes	No	Yes
<i>Sialkot</i>	99.23%	98.21%	98.14%	98.98%	Yes	Yes	Yes	Yes
<i>Gwadar</i>	94.30%	89.80%	99.83%	96.92%	Yes	No	Yes	Yes
<i>D.I Khan</i>	95.87%	98.89%	98.15%	97.92%	Yes	Yes	Yes	Yes

Table 3.1: 4G Signal Strength -100dBm with 90% Confidence Level

3.2. **3G SIGNAL STRENGTH.** During the survey, while conducting data test in auto mode, wherever network switched to 3G, the signal strength samples were recorded on survey routes. As per Next Generation Mobile Service (NGMS) licenses awarded, licensees are required to meet **the threshold of -100dBm or above of Received Signal Code Power (RSCP) with 90% confidence level**. The Confidence Level and Compliance of signal strength is shown in **Table 3.2: 3G Signal Strength -100dBm with 90% Confidence Level**.

3G Signal Strength -100dBm with 90% Confidence Level								
<i>City</i>	Confidence Level				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Khanpur</i>	100.00%	100.00%	100.00%	100.00%	Yes	Yes	Yes	Yes
<i>Sadiqabad</i>	100.00%	99.75%	99.93%	100.00%	Yes	Yes	Yes	Yes
<i>Kharian</i>	100.00%	100.00%	99.88%	100.00%	Yes	Yes	Yes	Yes
<i>Wazirabad</i>	100.00%	99.91%	99.95%	100.00%	Yes	Yes	Yes	Yes
<i>Kotri</i>	100.00%	100.00%	100.00%	100.00%	Yes	Yes	Yes	Yes
<i>Jacobabad</i>	99.90%	96.84%	100.00%	100.00%	Yes	Yes	Yes	Yes
<i>Dadu</i>	99.93%	100.00%	96.25%	100.00%	Yes	Yes	Yes	Yes
<i>Tando Allah Yar</i>	100.00%	99.99%	100.00%	100.00%	Yes	Yes	Yes	Yes
<i>Sialkot</i>	100.00%	100.00%	100.00%	100.00%	Yes	Yes	Yes	Yes
<i>Gwadar</i>	100.00%	97.80%	99.99%	98.83%	Yes	Yes	Yes	Yes
<i>D.I Khan</i>	99.88%	100.00%	100.00%	100.00%	Yes	Yes	Yes	Yes

Table 3.2: 3G Signal Strength -100dBm with 90% Confidence Level

MOBILE BROADBAND SERVICE

4.1. A total of **26,498** download test attempts made, out of which **19,541** were successful in **11 x surveyed cities**. The company wise average User Data Throughput, 4G/LTE, 3G and 2G signal strength detail is mentioned in **Table4.1: Data Tests Statistics**.

Description	Jazz	Telenor	Ufone	ZonG
<i>TOTAL DATA TEST ATTEMPTS</i>	5388	11339	5358	4413
<i>SUCCESSFUL DATA TEST ATTEMPTS</i>	5162	5091	5002	4286
<i>TEST ATTEMPTS SUCCESS RATIO (%)</i>	95.81	44.9	93.36	97.12
<i>USER DATA THROUGHPUT (Mbps)</i>	6.55	3.044	7.337	7.403
<i>AVERAGE 4G SIGNAL STRENGTH (RSRP) dBm</i>	-81.2	-84.1	-83.6	-79.5
<i>AVERAGE 4G SIGNAL STRENGTH (RSCP) dBm</i>	-68.26	-71.71	-68.81	-67.33
<i>AVERAGE 4G SIGNAL STRENGTH (RXLEV) dBm</i>	-70.24	-76.69	-75.71	-65.46

Table4.1: Data Tests Statistics

4.2. **4G USER DATA THROUGHPUT.** As per Next Generation Mobile Service (NGMS) licenses awarded, licensees are required to meet **the threshold of minimum of 2Mbps of 4G User Data Throughput**. The results of Data Service QoS KPI i.e. User Data Throughput is shown in **Table4.2.1: 4G User Data Throughput in Pakistan ≥ 2 Mbps & Table4.2.2: 4G User Data Throughput in AJK ≥ 2 Mbps**.

<i>City</i>	4G User Data Throughput (Mbps)				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Khanpur</i>	12.58	3.43	15.03	12.34	Second	Fourth	First	Third
<i>Sadiqabad</i>	11.67	6.55	25.18	16.50	Third	Fourth	First	Second
<i>Kharian</i>	10.70	3.13	1.35	14.26	Second	Third	Fourth	First
<i>Wazirabad</i>	7.72	3.97	12.30	15.19	Third	Fourth	Second	First
<i>Kotri</i>	20.14	6.27	9.38	16.75	First	Fourth	Third	Second