

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 Thirteen (13) different cities of Punjab, Sindh and Khyber Pakhtunkhwa (KPK). The name of cities along with survey dates are shown in **Table 1.1: QoS Survey Dates**:

S. #.	Province	City	Survey Dates
1.	Punjab	Attock	2 nd ~ 4 th Feb, 2021
2.		Multan	10 th ~ 15 th Feb, 2021
3.		Chakwal	16 th ~ 18 th Feb, 2021
4.		Bahawalpur	2 nd ~ 4 th Mar, 2021
5.		Mianwali	16 th ~ 17 th Mar, 2021
6.		Narowal	24 th ~ 25 th Mar, 2021
7.	Sindh	Nawabshah	2 nd ~ 4 th & 11 th Feb, 2021
8.		Sukkur	9 th ~ 11 th Feb, 2021
9.		Larkana	16 th ~ 18 th Feb, 2021
10.		Sanghar	2 nd ~ 3 rd Mar, 2021
11.		Badin	9 th ~ 10 th Mar, 2021
12.		Mirpur Khas	16 th ~ 17 th Mar, 2021
13.	Khyber Pakhtunkhwa	Nowshera	1 st ~ 2 nd Mar, 2021

Table 1.1: QOS Survey Dates

DRIVE TEST DETAILS

2.1. The QoS survey was carried out using the newly procured 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 Voice Calls and SMS Sessions, both A-Party and B-Party mobile handsets were kept in auto detect mode, whereas, in case of Data Sessions the mobile handset were locked in 4G/LTE and 3G mode. The Voice Calls and SMS Samples were distributed as 70% ON-NET and 30% OFF-NET.

MOBILE NETWORK COVERAGE

3.1. Mobile Network Signal Strength is measured in decibels (dBm). Signal Strength can range from approximately -30 dBm upto -120 dBm. The closer that number is to zero, the stronger the signal. In general, anything better than -100 decibel is considered a usable signal. The different ranges of signal strength and its effects on broadband speed and sustainability can be seen in **Table3.1: Signal Strength and Broadband Speed**.

S. #.	Signal Strength (dBm)	Signal Strength
1.	-65 to 0	Strong Signal with Maximum Data Speed
2.	-75 to -65	Strong Signal with Good Data Speed
3.	-85 to -75	Fair, Useful & Reliable Data Speed is Attainable
4.	-100 to -85	Marginal Data Speed with Possibility of Drop-Out
5.	-140 to -100	Performance will Drop Drastically

Table3.1: Signal Strength and Broadband Speed

3.2. **4G / LTE SIGNAL STRENGTH.** During the survey, 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 analysis of recorded signal strength revealed following:

- a. **COMPLIANCE.** The cities where CMOs remained compliant is mentioned in **Table 3.2: Compliance of 4G/LTE (RSRP) Signal Strength.**

S. #	Operator	Cities	
		Count	Names
1.	Jazz	12	Attock, Chakwal, Mianwali, Multan, Bahawalpur, Badin, Larkana, Mirpur Khas, Nawabshah, Sanghar, Sukkur, Nowshera
2.	Telenor	12	Attock, Chakwal, Mianwali, Narowal, Bahawalpur, Badin, Larkana, Mirpur Khas, Nawabshah, Sanghar, Sukkur, Nowshera
3.	Ufone	10	Attock, Chakwal, Mianwali, Narowal, Badin, Larkana, Nawabshah, Sanghar, Sukkur, Nowshera
4.	ZonG	13	Attock, Chakwal, Mianwali, Narowal, Multan, Bahawalpur, Badin, Larkana, Mirpur Khas, Nawabshah, Sanghar, Sukkur, Nowshera

Table 3.2: Compliance of 4G/LTE (RSRP) Signal Strength

- b. **NON-COMPLIANCE.** The cities where CMOs remained non-compliant is mentioned in **Table 3.3: Non-Compliance of 4G/LTE (RSRP) Signal Strength.**

S. #	Operator	Cities	
		Count	Names
1.	Jazz	1	Narowal
2.	Telenor	1	Multan
3.	Ufone	3	Multan, Bahawalpur, Mirpur Khas

Table 3.3: Non-Compliance of 4G/LTE (RSRP) Signal Strength

3.3. **3G SIGNAL STRENGTH.** During the survey 3G 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 analysis of recorded signal strength revealed that all CMOs remained compliant of the said threshold value at all 13 x surveyed cities.

MOBILE BROADBAND SERVICE

4.1. **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 analysis of Data Service QoS KPIs i.e. User Data Throughput Survey Results revealed following:

- a. **COMPLIANCE.** The cities where CMOs remained compliant is mentioned in **Table 4.1: Compliance of 4G User Data Throughput > 2 Mbps.**

S. #	Operator	Cities	
		Count	Names
1.	Jazz	12	Attock, Chakwal, Mianwali, Narowal, Multan, Bahawalpur, Badin, Larkana, Mirpur Khas, Sanghar, Sukkur, Nowshera
2.	Telenor	11	Attock, Chakwal, Mianwali, Narowal, Bahawalpur, Multan, Badin, Mirpur Khas, Nawabshah, Sukkur, Nowshera
3.	Ufone	12	Attock, Chakwal, Mianwali, Narowal, Multan, Bahawalpur, Badin, Larkana, Mirpur Khas, Nawabshah, Sukkur, Nowshera
4.	ZonG	13	Attock, Chakwal, Mianwali, Narowal, Multan, Bahawalpur, Badin, Larkana, Mirpur Khas, Nawabshah, Sanghar, Sukkur, Nowshera

Table 4.1: Compliance of 4G User Data Throughput > 2Mbps