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 Fourteen (14) x cities of Punjab, Sindh, Khyber Pakhtunkhwa (KPK) and Baluchistan during 2nd quarter i.e. April ~ June 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.	Balochistan	Ziarat	5	16 ~ 20 May 2022
2.		Mastung	6	23 ~ 27 May 2022 & 3 June 2022
3.		Khuzdar	4	30 ~ 31 May 2022 & 1 ~ 2 June 2022
4.		Sibbi	5	6 ~ 10 June 2022
5.		Usta Muhammad	5	13 ~ 17 June 2022
6.	Punjab	Faisalabad	5	23 ~ 27 May 2022
7.		Gojra	4	30 ~ 31 May 2022 & 1 ~ 2 June 2022
8.		Multan	3	21 ~ 23 June 2022
9.		Khanewal	2	29 ~ 30 June 2022
10.	KPK	Mingora	4	16 ~ 19 May 2022
11.		Batkhela	4	23 ~ 26 May 2022
12.		Mardan	4	30 ~ 31 May 2022 & 1 ~ 2 June 2022
13.		Abbottabad	4	6 ~ 9 June 2022
14.		Haripur	4	13 ~ 16 June 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 were kept in auto detect mode whereas in case of Data Sessions, the mobile handsets were kept both in auto detect as well as locked mode.

MOBILE NETWORK COVERAGE

3.1.   **4G / LTE SIGNAL STRENGTH**. During the survey, while conducting data test in technology auto detect mode as well as locked mode, 4G/LTE signal strength samples were recorded on survey routes. As per Next Generation Mobile Service (NGMS) licenses, licensees are required to meet the threshold of -100 dBm or above of Reference Signal Receive Power (RSRP) with 90% confidence level. The Confidence Level and Compliance of signal strength is shown in (i). **Table 3.1: 4G Signal Strength Technology Auto Detect Mode -100 dBM with 90% Confidence Level** & (ii). **Table 3.2: 4G Signal Strength Technology Locked Mode -100 dBm with 90% Confidence Level.**

4G Signal Strength -100dBm with 90% Confidence Level – Technology Auto Detect Mode								
City	Operators				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Batkhela	**88.02%**	99.78%	**N/A**	97.11%	**No**	Yes	**N/A**	Yes
Mingora	90.11%	99.40%	**87.99%**	96.38%	Yes	Yes	**No**	Yes
Mardan	97.52%	95.46%	98.23%	99.58%	Yes	Yes	Yes	Yes
Faisalabad	99.57%	97.18%	98.40%	99.10%	Yes	Yes	Yes	Yes
Mastung	93.00%	95.74%	99.99%	99.91%	Yes	Yes	Yes	Yes

City	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Gojra	95.10%	91.12%	**88.13%**	84.10%	Yes	Yes	**No**	No
Multan	99.87%	92.01%	96.83%	98.99%	Yes	Yes	Yes	Yes
Ziarat	N/A	97.11%	**85.55%**	98.84%	N/A	Yes	**No**	Yes
Khuzdar	**76.44%**	97.48%	97.86%	92.74%	**No**	Yes	Yes	Yes
Usta Muhammad	93.94%	**87.08%**	95.10%	94.02%	Yes	**No**	Yes	Yes
Sibbi	91.31%	**85.64%**	96.26%	95.80%	Yes	**No**	Yes	Yes
Abbottabad	95.88%	97.34%	97.72%	97.42%	Yes	Yes	Yes	Yes
Haripur	95.36%	**88.04%**	95.17%	98.18%	Yes	**No**	Yes	Yes
Khanewal	99.62%	**88.85%**	98.87%	99.72%	Yes	**No**	Yes	Yes

Table 3.1: 4G Signal Strength Technology Auto Detect Mode -100 dBm with 90% Confidence Level

4G Signal Strength -100dBm with 90% Confidence Level – Technology Locked Mode								
City	Operators				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Batkhela	**83.50%**	99.66%	**N/A**	97.62%	**No**	Yes	**N/A**	Yes
Mingora	**88.79%**	99.57%	**89.22%**	97.44%	**No**	Yes	**No**	Yes
Mardan	97.32%	94.04%	97.82%	99.62%	Yes	Yes	Yes	Yes
Faisalabad	99.69%	98.33%	98.65%	99.21%	Yes	Yes	Yes	Yes
Mastung	**89.63%**	98.32%	99.94%	99.62%	**No**	Yes	Yes	Yes
Gojra	96.91%	92.96%	90.82%	91.84%	Yes	Yes	Yes	Yes
Multan	99.84%	95.56%	95.61%	98.25%	Yes	Yes	Yes	Yes
Ziarat	**N/A**	96.29%	67.08%	98.84%	**N/A**	Yes	**No**	Yes
Khuzdar	**80.46%**	98.09%	95.19%	97.67%	**No**	Yes	Yes	Yes
Usta Muhammad	90.96%	86.26%	93.99%	97.13%	Yes	**No**	Yes	Yes
Sibbi	92.08%	91.36%	97.79%	97.79%	Yes	Yes	Yes	Yes
Abbottabad	96.51%	98.11%	97.84%	98.53%	Yes	Yes	Yes	Yes
Haripur	94.80%	**87.89%**	97.93%	97.56%	Yes	**No**	Yes	Yes
Khanewal	99.35%	93.70%	97.38%	99.55%	Yes	Yes	Yes	Yes

Table 3.2: 4G Signal Strength Technology Locked Mode -100 dBm with 90% Confidence Level

3.2. **3G SIGNAL STRENGTH IN TECNHOLOGY AUTO DETECT MODE**. During the survey, the signal strength samples were recorded on survey routes, wherever network switched to 3G while keeping the mobile handset in technology auto detect mode and also in technology locked mode. As per Next Generation Mobile Service (NGMS) licenses, licensees are required to meet the threshold of -100 dBm or above of Received Signal Code Power (RSCP) with 90% confidence level. The Confidence Level and Compliance of signal strength is shown in (i). **Table 3.3: 3G Signal Strength Technology Auto Detect Mode -100 dBm with 90% Confidence Level** (ii). **Table 3.4: 3G Signal Strength Technology Locked Mode -100 dBm with 90% Confidence Level.**

3G Signal Strength -100dBm with 90% Confidence Level – Technology Auto Detect Mode								
City	Operators				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Batkhela			99.82%				Yes	
Mingora			N/A				N/A	
Mardan	N/A		100.00%		N/A		Yes	
Faisalabad			100.00%				Yes	
Mastung			N/A				N/A	N/A
Gojra	100.00%	N/A	99.87%	N/A	Yes	N/A	Yes	
Multan			N/A				N/A	
Ziarat			97.43%				Yes	
Khuzdar	N/A		N/A		N/A		N/A	
Usta Muhammad			100.00%				Yes	
Sibbi			**N/A**	100.00%			**N/A**	Yes