

Quality of Service Survey

1. SURVEY CITIES

Quality of Service Survey was conducted in 16x cities of Khyber Pakhtunkhwa, Punjab, Sindh and Balochistan from 1st January till 31st March 2024. Survey routes were selected in a manner to cover 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	KMs
1	MARDAN	KHYBER PAKHTUNKHWA	04	22 nd ~25 th Jan, 2024	193
2	D.I KHAN		04	29 th Jan~1 st Feb, 2024	240
3	BAHAWALNAGAR	PUNJAB	04	23 rd ~26 th Jan, 2024	57
4	LAHORE		04	22 nd ~25 th Jan, 2024	174
5	CHUNIAN		04	26 th ~29 th Feb, 2024	159
6	RAWALPINDI		04	23 rd ~26 th Jan, 2024	236
7	SAMUNDARI		03	13 th ~19 th Feb, 2024	133
8	JHELM		04	20 th ~23 th Feb, 2024	166
9	SHARAPUR		04	5 th ~8 th Mar, 2024	180
10	QUETTA	BALOCHISTAN	04	20 st ~23 rd Feb, 2024	92
11	NUSHKI		04	26 th ~29 th Feb, 2024	50
12	SHIKARPUR	SINDH	04	22 nd ~25 th Jan, 2024	82
13	KARACHI MALIR		03	12 th ~14 th Feb, 2024	221
14	HYDERABAD		03	20 th ~22 th Feb, 2024	89
15	NAWABSHAH		04	22 nd ~25 th Feb, 2024	140
16	KOTRI		03	5 th ~7 th Mar, 2024	59

Table 1.1: QoS Survey Dates and Samples

2. TEST STATISTICS

During the survey, Quality of Services tests were conducted in the areas of Voice, Mobile Broadband (i.e. Data (Automode), Data (Ookla), Latency (Ookla) & 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
Data (Download)	6116	6093	6118	6134
Data (Upload)	6120	6096	6122	6140
Ookla (Download)	10423	10928	10551	10641
Ookla (Upload)	10423	10928	10551	10641
Ookla (Latency)	10423	10928	10551	10641
Webpage Browsing	17081	16583	17118	17171
Voice Call	5320	5296	5245	5311
Short Messaging Service	5109	5021	5095	5077

Table 2.1: Test Statistics

3. KEY PERFORMANCE INDICATORS (KPIs)

As per Cellular Mobile Network Quality of Service (QoS) Regulations 2021, all CMOs are required to meet or exceed the benchmark of QoS KPIs as shown in Table 3.1: QoS KPIs

Key Performance Indicators			Threshold Value
Voice	Network Accessibility		$\geq 99\%$
	Call Setup Success Rate		$\geq 98\%$
	Call Connection Time		< 7.5 Seconds
	Call Completion Ratio		$> 98\%$
	Mean Opinion Score		> 3
	ISHO for CS Voice		$\geq 98\%$
	RAB Setup Success Rate		$\geq 98\%$
SMS	SMS Success Rate		$\geq 99\%$
	SMS End-to-End Delivery Time		≤ 12 Seconds
Data (Automode)	Latency		< 75 ms
	Webpage Loading Time		< 5 Seconds
	Download Throughput		> 4 Mbps
	Download Throughput		> 1 Mbps
Network Coverage	Signal Strength (RSRP)	Signal Level	Minimum -100dBm
		Confidence Level	$> 90\%$
	Signal Strength (RSCP)	Signal Level	Minimum -100dBm
		Confidence Level	$> 90\%$

Table 3.1: QoS KPIs

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
BAHWALNAGAR	99.22	76.63	99.39	99.61	Yes	No	Yes	Yes
D.I KHAN	91.4	96.46	98.65	92.2	Yes	Yes	Yes	Yes
LAHORE	98.20	85.16	99.51	99.57	Yes	No	Yes	Yes
MARDAN	97.58	95.71	99.10	99.89	Yes	Yes	Yes	Yes
SAMUNDARI	98.00	95.00	100	99.00	Yes	Yes	Yes	Yes
SHIKARPUR	96.35	79.63	99.47	99.73	Yes	No	Yes	Yes
HYDERABAD	98.91	87.21	96.81	99.40	Yes	No	Yes	Yes
JHELMUM	97.11	79.96	99.17	97.74	Yes	No	Yes	Yes
KARACHI MALIR	97.87	87.38	98.06	93.43	Yes	No	Yes	Yes
NAWABSHAH	98.59	84.24	98.06	99.84	Yes	No	Yes	Yes
NUSHKI	N/A	89.02	94.47	95.09	N/A	No	Yes	Yes
QUETTA	99.64	90.10	99.75	99.29	Yes	Yes	Yes	Yes