

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 four (04) x cities of Azad Jammu & Kashmir (AJK), in First Quarter 2023. 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.	Azad Jammu & Kashmir (AJK)	Muzafarabad	3	1 st ~3 rd January, 2023
2.		Mirpur	4	6 th ~9 th February, 2023
3.		Kotli	3	14 th ~16 th February, 2023
4.		Rawalakot	3	21 st ~23 rd February, 2023

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 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 kept in Auto Detect and 3G Locked modes.

MOBILE NETWORK COVERAGE

3.1. **4G / LTE SIGNAL STRENGTH.** 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 and Cellular Mobile Network Quality of Service (QoS) Regulations 2021, 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	SCOM	Jazz	Telenor	Ufone	ZonG	SCOM
MUZAFARABAD	97.55%	97.05%	99.92%	94.99%	94.65%	Yes	Yes	Yes	Yes	Yes
MIRPUR	92.68%	94.25%	96.79%	95.45%	92.12%	Yes	Yes	Yes	Yes	Yes
KOTLI	89.90%	97.27%	97.46%	93.59%	91.83%	No	Yes	Yes	Yes	Yes
RAWALAKOT	96.07%	91.43%	98.52%	96.91%	98.77%	Yes	Yes	Yes	Yes	Yes

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

3.1. **3G SIGNAL STRENGTH.** Special Communication Organization (SCO) is the only Cellular Mobile Operator (CMO) offering 3G services in Azad Jammu & Kashmir. As per Next Generation Mobile Service (NGMS) licenses and Cellular Mobile Network Quality of Service (QoS) Regulations 2021, licensees are required to meet the threshold of -100dBm or above of Reference 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		
City	Confidence Level	Compliant (Yes/No)
	SCOM	SCOM
MUZAFARABAD	97.01%	Yes
MIRPUR	99.59%	Yes
KOTLI	99.21%	Yes
RAWALAKOT	99.99%	Yes

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

MOBILE BROADBAND SERVICE

4.1. A series of data tests including Capacity Tests, Data Transfer Tests, Web Browsing and Ping were carried out wherein Key Performance Indicators (KPIs) of Upload and Download User Data Throughput (i.e. Speed), Webpage Loading Time and Latency have been measured. Technology wise Signal Strength, Number of Tests, Upload and Download User Data Throughput, Webpage Loading Time and Latency detail is mentioned in **Table 4.1: Data Tests Statistics**.

DESCRIPTION					JAZZ	SCOM	TELENOR	UFONE	ZONG	
AUTO DETECT MODE	CAPACITY TEST		DOWNLOAD	ATTEMPTS	1226	1225	1226	1227	1231	
				SPEED (Mbps)	7.479	4.795	7.122	6.015	19.705	
			UPLOAD	ATTEMPTS	1230	1227	1227	1230	1232	
				SPEED (Mbps)	7.898	11.771	9.186	13.755	22.364	
	DATA TRANSFER TEST		DOWNLOAD	ATTEMPTS	1206	1239	1227	1225	1243	
				SPEED (Mbps)	5.245	4.846	5.105	5.65	9.784	
			UPLOAD	ATTEMPTS	1236	1239	1236	1236	1241	
				SPEED (Mbps)	7.783	8.176	6.031	7.143	9.967	
	BROWSING TEST		ATTEMPTS			4934	4929	4936	4926	4943
			LOADING TIME (Seconds)			6.5	6.99	7.26	6.85	6.09
	PING TEST		ATTEMPTS			1244	1245	1244	1245	1245
			LATENCY (millisecond)			104.93	66.55	101.46	65.34	100.63
AVERAGE 4G SIGNAL STRENGTH (RSRP) dBm					-85	-84.4	-84.5	-80.1	-83.5	
LOCKED MODE	3G	DATA TRANSFER TEST	DOWNLOAD	ATTEMPTS	N/A	752	N/A			
				SPEED (Mbps)		5.849				
			UPLOAD	ATTEMPTS		754				
				SPEED (Mbps)		1.475				
		PING TEST	ATTEMPTS			764				
			LATENCY (millisecond)			87.49				
		AVERAGE 3G SIGNAL STRENGTH (RSCP) dBm						-71.72		

Table4.1: Data Tests Statistics.

4.2. **4G USER DATA THROUGHPUT.** As per Next Generation Mobile Service (NGMS) licenses and Cellular Mobile Network Quality of Service (QoS) Regulations 2021, licensees are required to meet **the threshold of minimum of 2Mbps of 4G User Data Throughput** in AJK. The results of Data Service QoS KPI i.e. User Data Throughput are shown in **Table4.2: 4G User Data Throughput \geq 2 Mbps**.

City	4G User Data Throughput (Mbps)					Operator Position				
	Jazz	Telenor	Ufone	ZonG	SCOM	Jazz	Telenor	Ufone	ZonG	SCOM
MUZAFARABAD	6.44	7.16	3.93	17.92	5.47	Third	Second	Fifth	First	Fourth
MIRPUR	7.50	9.77	11.98	19.34	4.86	Fourth	Third	Second	First	Fifth
KOTLI	6.52	4.64	4.07	16.42	2.71	Second	Third	Fourth	First	Fifth
RAWALAKOT	8.50	6.07	2.93	22.68	5.47	Second	Third	Fifth	First	Fourth

Table4.2: 4G User Data Throughput \geq 2 Mbps