

INDEPENDENT QUALITY OF SERVICE SURVEY REPORT

INTRODUCTION

In order to measure the performance and service quality of 2G (GSM), 3G (UMTS/HSPA+ etc.) and 4G (LTE), of Cellular Mobile Operators (CMOs), independent Quality of Service (QoS) Survey has been carried out from 23rd November ~ 11th December 2020 in seven (07) different cities of Punjab, Sindh, Khyber Pakhtunkhwa and Balochistan. The name of cities alongwith date of surveys are as under:

<i>S. #.</i>	City	Survey Dates
1.	Kabirwala	24 ~ 27 Nov 2020
2.	Hyderabad	23 ~ 26 Nov 2020
3.	Islamabad	30 Nov ~ 03 Dec 2020
4.	Karachi	30 Nov ~ 04 Dec 2020
5.	Lahore	01 ~ 07 Dec 2020
6.	Quetta	07 ~ 10 Dec 2020
7.	Peshawar	08 ~ 11 Dec 2020

DRIVE TEST DETAILS

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 the survey, Key Performance Indicators (KPIs) of Data Service, SMS Service and Voice Services have been measured.

DATA SERVICES – KEY PERFORMANCE INDICATORS RESULTS

The performance of data services of CMOs has been checked by measuring User Data Throughput and Signal Strength (i.e. Received Signal Code Power (RSCP) for 3G and Reference Signal Receive Power (RSRP) for 4G).

USER DATA THROUGHPUT. This KPI defines user data rate (Internet speed) to be provided by CMOs to mobile users across the coverage areas.

CMOs have achieved the threshold value of minimum 256Kbps of 3G User Data Throughput in all surveyed cities.

Except **ZonG at Lahore, Peshawar & Kabirwala and Ufone at Quetta**, **CMOs have achieved** the threshold value of minimum 2Mbps of 4G User Data Throughput in surveyed cities.

SIGNAL STRENGTH. This KPI defines Received Signal Code Power (RSCP) for 3G and Reference Signal Receive Power (RSRP) for 4G and denotes the power measured by a receiver on a particular physical communication channel. It is used as an indication of signal strength, as a handover criterion, in downlink power control, and to calculate path loss.

CMOs have achieved the threshold value of 3G RSCP of minimum of -100dBm with 90% Confidence Level on surveyed routes of all surveyed cities.

Except **Ufone at Hyderabad**, **CMOs have achieved** the threshold value of 4G RSRP of minimum of -100dBm with 90% Confidence Level on surveyed routes of surveyed cities.