COVERAGE ANALYSIS

Mobile Network Signal Strength is measured in decibels (dBm). Signal Strength can range from approximately -30 dBm to -100 dBm. The closer that number is to 0, the stronger the signal. In general, anything better than -85 decibels is considered a usable signal. In CMOs licenses, Mobile Signal Strength minimum level in outdoor is defined as -100dBm with 90% confidence. The different ranges of signal strength and its effects can be categorized as under:

S. #.	Signal Strength Ranges (dBm)	Signal Strength	
		Category	Description
1.	-65 to 0	Excellent	Strong Signal with Maximum Data Speed
2.	-75 to -65	Good	Strong Signal with Good Data Speed
3.	-85 to -75	Fair	Fair, Useful & Reliable Data Speed is Attainable
4.	-100 to -85	Poor	Marginal Data Speed with Possibility of Drop-Out
5.	-140 to -100	Very Poor / No	Performance will Drop Drastically

SIGNAL STRENGTH SAMPLES

The analysis of signal strength samples recorded during drive test on survey routes revealed following:

Technology	Category	Coverage/ Signal Strength Survey Results
3G	EXCELLENT	○ Ufone has greater percentage of 3G Excellent Coverage which resulted into higher 3G User Data Throughput. ○ The highest percentage of 3G Excellent Coverage was 86.5% of Ufone at Karachi, whereas the lowest percentage was 18.9% of Jazz at Kabirwala. ○ The average percentage of 3G Excellent Coverage of Ufone, ZonG, Telenor and Jazz was found as 70.8%, 62.3%, 58.9% and 52.3% respectively.
	GOOD	○ The average percentage of 3G Good Coverage of Jazz, ZonG, Telenor and Ufone was 31.7%, 28%, 27.5% and 21.2% respectively.
	FAIR	○ The average percentage of 3G Fair Coverage of Jazz, Telenor, ZonG and Ufone was 12.9%, 11.5%, 8.8% and 7.5% respectively.

VOICE SERVICES - KEY PERFORMANCE INDICATORS RESULTS

The performance of voice services of CMOs has been checked by measuring Grade of Service, Service Accessibility, Call Connection Time, Call Completion Ratio and End-to-End Speech Quality.

GRADE OF SERVICE (GOS). Grade of Service is probability that the end customer cannot access the mobile services when requested if it is offered by display of the network indicator on the mobile phone. In simple words, Grade of Service is Network Blocking.

None of the CMOs have achieved the Grade of Service of $< 2\%$, in all the surveyed cities.

SERVICE ACCESSIBILITY. Service Accessibility is the probability that the user can access the desired service. A given network accessibility is a precondition for this phase.

None of the CMOs have achieved the Service Accessibility of $> 98\%$ in all the surveyed cities.

CALL CONNECTION TIME. Call Connection Time is the time between sending of complete call initiation information by the caller and in return receipt of call setup notification. In simple words, it is time between dialing a number and hearing ring-back tone.

None of the CMOs have achieved the Call Connection Time of < 6.5 Seconds in all the surveyed cities.

CALL COMPLETION RATIO. Call Completion Ratio is the probability that a service, once obtained, will continue to be provided under given conditions for a given time duration or until deliberately terminated by either caller (A-party) or receiver (B-party). In simple words, this KPI provides information about Call Drops.

None of the CMOs have achieved the Call Completion Ratio of $> 98\%$ in all the surveyed cities.

END-TO-END SPEECH QUALITY. End-to-End Speech Quality is the degree of speech quality that a listener perceives at the terminal/mobile with a talker at the other end. In simple words, it provides information about clarity of voice.

None of the CMOs have achieved the End-to-End Speech Quality/ Mean Opinion Score of ≥ 3 in all the surveyed cities.