

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 at Thirteen (13) x Motorways & Highways during 4th Quarter i.e. October ~ December 2022. The name of Motorways and Highways along with survey dates are mentioned in **Table 1.1: QoS Survey of Motorways/Highways & Dates**:

S. #	Name	From	To	Survey Date
1.	N-50	QUETTA	ZHOB	21 Nov 2022
2.	N-50	ZHOB	QUETTA	25 Nov, 2022
3.	N-60	LAHORE	SARGODHA	13~ 14 Oct, 2022
4.	N-5	LAHORE	RAWALPINDI	21 ~ 22 Dec, 2022
5.	N-5	LAHORE	MULTAN	1 ~ 2 Dec , 2022
6.	N-80	ISLAMABAD	KOHAT	17 Nov ~ 18 Nov 2022
7.	N-130	MIANWALI	BAKHAR	5 Dec 2022
8.	M-14	ISAMABAD	D.I KHAN	30 Nov~1 Dec 2022
9.	N-115	TRANDA MUHAMMAD PANAH	JALALPUR PIRWALA	15 Dec 2022
10.	N-5	KOT SABZAL	MULTAN	20 Dec~ 21 Dec 2022
11.	N-95	CHAKDARA	BAHRAIN	23 Nov 2022
12.	N-90	KHAWAZKHEL	BEHSAM	24 Nov 2022
13.	N-55	PESHAWER	D.G KHAN	29 Nov ~ 2 Dec 2022

Table 1.1: QoS Survey of Motorways / Highways & Dates

DRIVE TEST DETAILS

2.1. The QoS survey was carried out using Automated QoS Monitoring & Benchmarking Tool i.e. "SMARTBENCHMARKER". Drive test teams covered Motorways and Highways from one Toll Plaza to another Toll Plaza. During the survey, mobile handsets for Voice Calls, SMS were kept in technology auto detect mode whereas in case of Mobile Broadband, the 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. Road wise compliance of 90% confidence level 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								
Road Name	Confidence Level (%)				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Quetta to Zhob	62.45	82.28	92.9	88.0	No	No	Yes	No
Zhob to Quetta	68.47	81.72	92.06	90.55	No	No	Yes	Yes
Lahore to Sargodha	95.03	84.25	83.09	85.71	Yes	No	No	No
Lahore to Rawalpindi	94.23	86.36	94.99	96.98	Yes	No	Yes	Yes
Lahore to Multan	94.74	79.00	81.36	93.98	Yes	No	No	Yes

<i>Islamabad to Kohat</i>	78.17	77.61	90.12	75.61	No	No	Yes	No
<i>Mianwali to Bakhar</i>	65.04	67.08	68.17	60.61	No	No	No	No
<i>Islamabad to D.I Khan</i>	77.71	72.74	79.77	65.65	No	No	No	No
<i>T.M Panah to Jalalpur Pirwala</i>	83.21	67.41	64.11	79.10	No	No	No	No
<i>Kot Sabzal to Multan</i>	95.00	82.80	77.94	92.23	Yes	No	No	Yes
<i>Chakdara to Kalam</i>	80.57	98.57	87.64	81.16	No	Yes	No	No
<i>Khuazakhela to Behsam</i>	71.32	76.37	85.96	57.26	No	No	No	No
<i>Peshawer to DG Khan</i>	75.28	87.58	88.12	76.21	No	No	No	No

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								
Road Name	Confidence Level (%)				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Zhob to Quetta</i>	75.44	85.19	85.68	84.17	No	No	No	No
<i>Lahore to Sargodha</i>	95.84	89.11	84.95	83.62	Yes	No	No	No
<i>Lahore to Rawalpindi</i>	95.39	88.07	95.34	97.68	Yes	No	Yes	Yes
<i>Lahore to Multan</i>	94.85	84.89	82.01	94.28	Yes	No	No	Yes
<i>Islamabad to Kohat</i>	77.78	80.88	80.58	81.81	No	No	No	No
<i>Mianwali to Bakhar</i>	67.48	66.69	51.28	58.92	No	No	No	No
<i>Islamabad to D.I Khan</i>	75.76	65.39	60.60	61.77	No	No	No	No
<i>T.M Panah to Jalalpur Pirwala</i>	87.27	64.25	63.16	83.07	No	No	No	No
<i>Kot Sabzal to Multan</i>	95.20	87.02	69.78	91.2	Yes	No	No	Yes
<i>Chakdara to Kalam</i>	82.03	98.20	85.72	87.65	No	Yes	No	No
<i>Khuazakhela to Behsam</i>	53.58	74.10	62.38	62.72	No	No	No	No
<i>Peshawer to DG Khan</i>	78.0	83.88	77.13	78.91	No	No	No	No

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

3.2. **3G SIGNAL STRENGTH IN TECHNOLOGY AUTO DETECT MODE.** During the survey, while conducting data tests, 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. Road wise compliance of 90% confidence level 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								
Road Name	Confidence Level (%)				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Quetta to Zhob</i>	94.90	98.84	98.72	65.06	Yes	Yes	Yes	No
<i>Zhob to Quetta</i>	89.02	94.77	96.84	82.14	No	Yes	Yes	No
<i>Lahore to Sargodha</i>	N/A	N/A	100.0	95.49	N/A	N/A	Yes	Yes
<i>Lahore to Rawalpindi</i>	N/A	59.7	95.07	64.63	N/A	No	Yes	No
<i>Lahore to Multan</i>	N/A	100.0	97.63	N/A	N/A	Yes	Yes	N/A
<i>Islamabad to Kohat</i>	92.52	100.0	80.06	58.85	Yes	Yes	No	No
<i>Mianwali to Bakhar</i>	20.41	57.89	72.70	64.04	No	No	No	No
<i>Islamabad to D.I Khan</i>	77.64	81.65	77.25	67.20	No	No	No	No
<i>T.M Panah to Jalalpur Pirwala</i>	N/A	90.81	N/A	85.29	N/A	Yes	N/A	No
<i>Kot Sabzal to Multan</i>	N/A	96.61	91.61	100.0	N/A	Yes	Yes	Yes
<i>Chakdara to Kalam</i>	86.25	100.0	99.17	70.77	No	Yes	Yes	No
<i>Khuazakhela to Behsam</i>	85.92%	100.0	74.14	63.86	No	Yes	No	No