

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 on thirteen (13) x Motorways and Highways during 3rd Quarter i.e. July ~ September 2022. The name of Motorways, Highways and Inter-Cities Roads along with survey dates are mentioned in **Table 1.1: QoS Survey Roads & Dates**:

Motorways/ Highways/ Inter Cities Roads				
S. #	Name	From	To	Survey Date
1.	M-15	Hasan Abdal	Thakot	27 th ~ 28 th July, 2022
2.	N-25	Quetta	Karachi	29 th July, 2022
3.	N-125	Haripur	Taxila	22 nd August, 2022
4.	M-4	Pindi Bhatian	Multan	22 nd ~ 24 th August, 2022
5.	M-1	Islamabad	Peshawar	23 rd August ~ 29 th August, 2022
6.	M-2	Lahore	Islamabad	23 rd ~ 24 th August, 2022
7.	M-5	Multan	Sukkur	24 th ~ 25 th August, 2022
8.	N-5	Rawalpindi	Turkham	25 th ~ 26 th August, 2022
9.	M-3	Lahore	Abdul Hakeem	29 th August, 2022
10.	N-75	Islamabad	Kohala	29 th August, 2022
11.	M-11	Lahore	Sialkot	30 th August, 2022
12.	M-16	Swabi	Katlang	5 th September, 2022
13.	N-45	Nowshera	Chitral	12 th ~ 15 th September, 2022

Table 1.1: QoS Survey Roads & 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 city to another city. During the survey, mobile handsets for Voice Calls, SMS were kept in auto detect mode whereas in case of Data Sessions, the mobile 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	Operators				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Hazara Motorway	77.53%	67.74%	84.18%	77.06%	No	No	No	No
Quetta To Karachi	71.97%	80.44%	93.68%	81.18%	No	No	Yes	No
Haripur To Taxila	56.56%	76.36%	85.62%	67.35%	No	No	No	No

<i>Pindi Bhatian To Multan</i>	91.04%	85.07%	80.38%	79.96%	Yes	No	No	No
<i>Multan to Sukkur</i>	87.47%	61.28%	66.56%	73.63%	No	No	No	No
<i>Nowshera To Chitral</i>	85.46%	87.47%	88.16%	86.41%	No	No	No	No
<i>Swabi To Katlang</i>	69.27%	94.27%	0.00%	61.56%	No	Yes	No	No
<i>Islamabad To Kohala</i>	82.58%	70.40%	74.68%	79.54%	No	No	No	No
<i>Islamabad To Peshawar</i>	80.14%	84.65%	92.80%	88.05%	No	No	Yes	No
<i>Lahore to Abdul Hakeem</i>	94.57%	93.80%	N/A	94.78%	Yes	Yes	N/A	Yes
<i>Lahore to Islamabad</i>	87.69%	78.30%	92.28%	79.08%	No	No	Yes	No
<i>Lahore To Sialkot</i>	98.90%	99.30%	N/A	98.35%	Yes	Yes	N/A	Yes
<i>Rawalpindi To Turkham</i>	87.38%	89.81%	93.05%	86.49%	No	No	Yes	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	Operators				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Hazara Motorway</i>	78.79%	68.53%	67.99%	76.76%	No	No	No	No
<i>Haripur To Taxila</i>	60.52%	62.81%	67.09%	71.24%	No	No	No	No
<i>Pindi Bhatian To Multan</i>	87.73%	84.66%	73.25%	77.71%	No	No	No	No
<i>Multan to Sukkur</i>	88.77%	67.51%	67.76%	82.64%	No	No	No	No
<i>Nowshera To Chitral</i>	83.57%	84.66%	85.87%	88.62%	No	No	No	No
<i>Swabi To Katlang</i>	63.10%	94.49%	78.69%	74.07%	No	Yes	No	No
<i>Islamabad To Kohala</i>	82.94%	70.66%	79.67%	84.77%	No	No	No	No
<i>Islamabad To Peshawar</i>	85.58%	87.15%	94.03%	87.24%	No	No	Yes	No
<i>Lahore to Abdul Hakeem</i>	97.65%	91.03%	93.52%	96.08%	Yes	Yes	Yes	Yes
<i>Lahore to Islamabad</i>	92.01%	83.88%	87.56%	85.31%	Yes	No	No	No
<i>Lahore To Sialkot</i>	98.64%	98.86%	96.12%	97.09%	Yes	Yes	Yes	Yes
<i>Rawalpindi To Turkham</i>	89.81%	86.31%	90.35%	86.05%	No	No	Yes	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, 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	Operators				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
<i>Hazara Motorway</i>	72.54%	93.62%	78.23%	78.79%	No	Yes	No	No
<i>Quetta To Karachi</i>	89.56%	86.36%	97.19%	91.39%	No	No	Yes	Yes