

# 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 3<sup>rd</sup> 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 <sup>th</sup> ~ 28 <sup>th</sup> July, 2022
2.	N-25	Quetta	Karachi	29 <sup>th</sup> July, 2022
3.	N-125	Haripur	Taxila	22 <sup>nd</sup> August, 2022
4.	M-4	Pindi Bhatian	Multan	22 <sup>nd</sup> ~ 24 <sup>th</sup> August, 2022
5.	M-1	Islamabad	Peshawar	23 <sup>rd</sup> August ~ 29 <sup>th</sup> August, 2022
6.	M-2	Lahore	Islamabad	23 <sup>rd</sup> ~ 24 <sup>th</sup> August, 2022
7.	M-5	Multan	Sukkur	24 <sup>th</sup> ~ 25 <sup>th</sup> August, 2022
8.	N-5	Rawalpindi	Turkham	25 <sup>th</sup> ~ 26 <sup>th</sup> August, 2022
9.	M-3	Lahore	Abdul Hakeem	29 <sup>th</sup> August, 2022
10.	N-75	Islamabad	Kohala	29 <sup>th</sup> August, 2022
11.	M-11	Lahore	Sialkot	30 <sup>th</sup> August, 2022
12.	M-16	Swabi	Katlang	5 <sup>th</sup> September, 2022
13.	N-45	Nowshera	Chitral	12 <sup>th</sup> ~ 15 <sup>th</sup> 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>Haripur To Taxila</i>	<b>56.56%</b>	<b>76.36%</b>	<b>85.62%</b>	<b>67.35%</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>
<i>Pindi Bhatian To Multan</i>	<b>N/A</b>	100.00%	95.85%	100.00%	<b>N/A</b>	Yes	Yes	Yes
<i>Multan to Sukkur</i>	<b>N/A</b>							
<i>Nowshera To Chitral</i>	91.36%	91.36%	90.10%	91.44%	Yes	Yes	Yes	Yes
<i>Swabi To Katlang</i>	<b>N/A</b>	100.00%	98.24%	100.00%	<b>N/A</b>	Yes	Yes	Yes
<i>Islamabad To Kohala</i>	99.74%	100.00%	96.12%	<b>N/A</b>	Yes	Yes	Yes	<b>N/A</b>
<i>Islamabad To Peshawar</i>	<b>80.14%</b>	<b>84.65%</b>	92.80%	<b>88.05%</b>	<b>No</b>	<b>No</b>	Yes	<b>No</b>
<i>Lahore to Abdul Hakeem</i>	<b>N/A</b>	100.00%	95.38%	100.00%	<b>N/A</b>	Yes	Yes	Yes
<i>Lahore to Islamabad</i>	99.68%	98.75%	96.95%	94.74%	Yes	Yes	Yes	Yes
<i>Lahore To Sialkot</i>	98.90%	99.30%	<b>N/A</b>	98.35%	Yes	Yes	<b>N/A</b>	Yes
<i>Rawalpindi To Turkham</i>	<b>87.38%</b>	<b>89.81%</b>	93.05%	<b>86.49%</b>	<b>No</b>	<b>No</b>	Yes	<b>No</b>

**Table 3.3: 3G Signal Strength Technology Auto Detect Mode -100 dBm with 90% Confidence Level**

<b>3G Signal Strength -100dBm with 90% Confidence Level – Technology Locked Mode</b>								
<b>Road Name</b>	<b>Operators</b>				<b>Compliant (Yes/No)</b>			
	<b>Jazz</b>	<b>Telenor</b>	<b>Ufone</b>	<b>ZonG</b>	<b>Jazz</b>	<b>Telenor</b>	<b>Ufone</b>	<b>ZonG</b>
<i>Hazara Motorway</i>	<b>87.81%</b>	93.83%	91.90%	95.90%	<b>No</b>	Yes	Yes	Yes
<i>Haripur To Taxila</i>	<b>73.26%</b>	97.81%	93.90%	97.51%	<b>No</b>	Yes	Yes	Yes
<i>Pindi Bhatian To Multan</i>	99.98%	100.00%	95.09%	99.93%	Yes	Yes	Yes	Yes
<i>Multan to Sukkur</i>	96.90%	97.76%	<b>69.19%</b>	98.66%	Yes	Yes	<b>No</b>	Yes
<i>Nowshera To Chitral</i>	<b>84.74%</b>	98.14%	<b>89.87%</b>	97.25%	<b>No</b>	Yes	<b>No</b>	Yes
<i>Swabi To Katlang</i>	<b>82.41%</b>	99.92%	95.47%	98.42%	<b>No</b>	Yes	Yes	Yes
<i>Islamabad To Kohala</i>	92.94%	98.15%	95.79%	99.75%	Yes	Yes	Yes	Yes
<i>Islamabad To Peshawar</i>	95.14%	99.33%	100.00%	99.81%	Yes	Yes	Yes	Yes
<i>Lahore to Abdul Hakeem</i>	99.95%	100.00%	94.13%	100.00%	Yes	Yes	Yes	Yes
<i>Lahore to Islamabad</i>	99.60%	98.17%	99.73%	99.67%	Yes	Yes	Yes	Yes
<i>Lahore To Sialkot</i>	100.00%	100.00%	99.90%	100.00%	Yes	Yes	Yes	Yes
<i>Rawalpindi To Turkham</i>	98.01%	97.71%	97.33%	98.04%	Yes	Yes	Yes	Yes

**Table 3.4: 3G Signal Strength Technology Locked Mode -100 dBm with 90% Confidence Level**

## **MOBILE BROADBAND SERVICE**

4.1. **DATA SESSIONS IN TECHNOLOGY AUTO DETECT MODE & LOCKED MODE.** 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. In Fixed Duration Testing, a File of 10GB was downloaded and Uploaded for 3 minutes duration whereas in Fixed Size Testing, a File of 5MB and 2MB was completely downloaded and uploaded respectively. In order to measure Webpage Loading Time, different national webpages were checked and in case of Latency international and national host were pinged to measure Round Trip Time (RTT)/Latency. The 4G/LTE, 3G and 2G 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**.