

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 eight (08) x Motorways, Highways and Inter-Cities Roads during 1st quarter i.e. January ~ March 2022. The name of Motorways, Highways and Inter-Cities Roads along with survey dates are mentioned in **Table 1.1: QoS Survey Roads & Dates**:

S. #.	Motorways/ Highways/ Inter Cities Roads			Survey Date
	Name	From	To	
1.	M-9 Motorway/N-5 Highway	Karachi	Kotri	11 February 2022
2.	M-5/Multan Sukkur Motorway	Multan	Sadiqabad	07 February 2022
3.	GT-Road /Mirpur-Bhimber Road	Rawalpindi	Bhimber	07 February 2022
4.	N-65 Highway	Sukkur	Jacobabad	15 February 2022
5.	M-14 / Hakla-Yarik Motorway	Rawalpindi	D.I. Khan	21 February 2022
6.	N-5 Highway	Sukkur	Dadu	22 February 2022
7.	E-75 /Murree Expressway	Rawalpindi	Muzaffarabad	28 February 2022
8.	GT-Road	Lahore	Kharian	14 March 2022

Table 1.1: QoS Survey Dates and Samples

DRIVE TEST DETAILS

2.1. The QoS survey was carried out using Automated QoS Monitoring & Benchmarking Tool i.e. "SMARTBENCHMARKER". Drive test teams covered Motorway / Highway/Inter Cities Roads from one city to other city. During the survey, mobile handsets for Voice Calls, SMS and Data Sessions, were kept in auto detect mode.

NETWORK COVERAGE

3.1. **4G / LTE SIGNAL STRENGTH.** During the survey, 4G/LTE signal strength samples were recorded on survey routes. As per Next Generation Mobile Service (NGMS) licenses awarded, licensees are required to meet the threshold of -100dBm or above of Reference Signal Receive Power (RSRP) with 90% confidence level. The Confidence Level and Compliance of signal strength is shown in **Table 3.1: 4G Signal Strength -100dBm with 90% Confidence Level**.

Road Name	4G Signal Strength Confidence Level				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Karachi to Kotri	94.79%	95.09%	83.81%	87.28%	Yes	Yes	No	No
Multan to Sadiqabad	95.86%	75.84%	7.43%	87.96%	Yes	No	No	No
Lahore to Kharian	98.22%	97.98%	93.79%	97.86%	Yes	Yes	Yes	Yes
Sukkur to Dadu	91.66%	63.19%	66.56%	83.57%	Yes	No	No	No
Sukkur to Jacobabad	95.86%	72.56%	51.11%	95.28%	Yes	No	No	Yes
M-14 Motorway	86.74%	87.19%	93.63%	83.85%	No	No	Yes	No
Rawalpindi to Bhimber	92.61%	92.47%	86.34%	94.37%	Yes	Yes	No	Yes
Rawalpindi to Muzaffarabad	86.71%	71.34%	74.36%	82.85%	No	No	No	No

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

3.2. **3G SIGNAL STRENGTH.** During the survey 3G signal strength samples were recorded on survey routes. As per Next Generation Mobile Service (NGMS) licenses awarded, licensees are required to meet **the threshold of -100dBm or above of Received Signal Code Power (RSCP) with 90% confidence level.** The Confidence Level and Compliance of signal strength is shown in **Table 3.2: 3G Signal Strength -100dBm with 90% Confidence Level.**

Road Name	3G Signal Strength Confidence Level				Compliant (Yes/No)			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Karachi to Kotri	99.98%	98.04%	99.99%	99.93%	Yes	Yes	Yes	Yes
Multan to Sadiqabad	98.95%	99.01%	74.63%	100.00%	Yes	Yes	No	Yes
Lahore to Kharian	100.00%	100.00%	100.00%	100.00%	Yes	Yes	Yes	Yes
Sukkur to Dadu	99.07%	92.81%	97.27%	99.70%	Yes	Yes	Yes	Yes
Sukkur to Jacobabad	99.31%	100.00%	99.87%	100.00%	Yes	Yes	Yes	Yes
M-14 Motorway	95.38%	95.56%	94.80%	79.14%	Yes	Yes	No	Yes
Rawalpindi to Bhimber	96.18%	98.49%	98.30%	98.88%	Yes	Yes	Yes	Yes
Rawalpindi to Muzaffarabad	91.40%	99.30%	97.46%	99.24%	Yes	Yes	Yes	Yes

Table 3.2: 3G Signal Strength -100dBm with 90% Confidence Level

MOBILE BROADBAND SERVICE

4.1. A total of **3,790 successful http download test attempts** made. The company wise detail of Test Attempt Success Ratio, User Data Throughput, 4G/LTE, 3G & 2G Network Signal Strength is mentioned in **Table4.1: Data Tests Statistics.**

Description	Jazz	Telenor	Ufone	ZonG
SUCCESSFUL DATA TEST ATTEMPTS	997	1005	777	1011
TEST ATTEMPTS SUCCESS RATIO (%)	2.14	5.45	1.1	4.34
USER DATA THROUGHPUT (Mbps)	6.513	2.853	6.182	7.229
AVERAGE 4G SIGNAL STRENGTH (RSRP) dBm	-84.6	-88.7	-86.9	-86.8
AVERAGE 4G SIGNAL STRENGTH (RSCP) dBm	-73.55	-74.95	-77.4	-75.12
AVERAGE 4G SIGNAL STRENGTH (RXLEV) dBm	-73.38	-79.7	-78.64	-76.42

Table4.1: Data Tests Statistics

4.2. **4G USER DATA THROUGHPUT.** As per Next Generation Mobile Service (NGMS) licenses awarded, licensees are required to meet **the threshold of minimum of 2Mbps of 4G User Data Throughput.** The results of Data Service QoS KPI i.e. User Data Throughput on **8 x surveyed roads** is shown in **Table4.2: 4G User Data Throughput \geq 2 Mbps.**

Road Name	User Data Throughput (Mbps)				Operator Position			
	Jazz	Telenor	Ufone	ZonG	Jazz	Telenor	Ufone	ZonG
Karachi to Kotri	8.27	6.51	9.58	12.24	Third	Fourth	Second	First
Multan to Sadiqabad	10.21	3.93	6.54	8.67	First	Fourth	Third	Second
Lahore to Kharian	4.88	3.83	14.42	13.43	Third	Fourth	First	Second
Sukkur to Dadu	11.24	4.09	19.61	20.68	Third	Fourth	Second	First
Sukkur to Jacobabad	14.36	4.82	12.08	23.32	Second	Fourth	Third	First
M-14 Motorway	7.39	2.29	7.59	9.29	Third	Fourth	Second	First
Rawalpindi to Bhimber	9.27	2.51	13.17	9.74	Third	Fourth	First	Second
Rawalpindi to Muzaffarabad	16.28	3.90	19.36	13.00	Second	Fourth	First	Third

Table4.2: 4G User Data Throughput \geq 2 Mbps