

INDEPENDENT QUALITY OF SERVICE **SURVEY IN AJK – CITIES**

FIRST QUARTER 2023

ENFORCEMENT WIRELESS – II DIRECTORATE
PTA | F-5/1, ISLAMABAD

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 in four (04) x cities of Azad Jammu & Kashmir (AJK), in First Quarter 2023. The name of cities along with survey dates are mentioned in **Table 1.1: QoS Survey Cities & Dates:**

S. #.	Province	City	Days	Survey Dates
1.	Azad Jammu & Kashmir (AJK)	Muzafarabad	3	1 st ~3 rd January, 2023
2.		Mirpur	4	6 th ~9 th February, 2023
3.		Kotli	3	14 th ~16 th February, 2023
4.		Rawalakot	3	21 st ~23 rd February, 2023

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 selected survey routes in such a manner to cover main roads, service roads and majority of sectors/colonies. During Voice Calls and SMS Sessions, both A-Party and B-Party mobile handsets were kept in auto detect mode, whereas, in case of Data Sessions the mobile handset were kept in Auto Detect and 3G Locked modes.

MOBILE NETWORK COVERAGE

3.1. **4G / LTE SIGNAL STRENGTH.** While conducting data test in auto mode, 4G/LTE signal strength samples were recorded on survey routes. As per Next Generation Mobile Service (NGMS) licenses and Cellular Mobile Network Quality of Service (QoS) Regulations 2021, 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**

4G Signal Strength -100dBm with 90% Confidence Level										
City	Confidence Level					Compliant (Yes/No)				
	Jazz	Telenor	Ufone	ZonG	SCOM	Jazz	Telenor	Ufone	ZonG	SCOM
MUZAFARABAD	97.55%	97.05%	99.92%	94.99%	94.65%	Yes	Yes	Yes	Yes	Yes
MIRPUR	92.68%	94.25%	96.79%	95.45%	92.12%	Yes	Yes	Yes	Yes	Yes
KOTLI	89.90%	97.27%	97.46%	93.59%	91.83%	No	Yes	Yes	Yes	Yes
RAWALAKOT	96.07%	91.43%	98.52%	96.91%	98.77%	Yes	Yes	Yes	Yes	Yes

Table 3.1: 4G Signal Strength -100dBm with 90% Confidence Level

3.1. **3G SIGNAL STRENGTH.** Special Communication Organization (SCO) is the only Cellular Mobile Operator (CMO) offering 3G services in Azad Jammu & Kashmir. As per Next Generation Mobile Service (NGMS) licenses and Cellular Mobile Network Quality of Service (QoS) Regulations 2021, licensees are required to meet **the threshold of -100dBm or above of Reference 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**

3G Signal Strength -100dBm with 90% Confidence Level		
City	Confidence Level	Compliant (Yes/No)
	SCOM	SCOM
MUZAFARABAD	97.01%	Yes
MIRPUR	99.59%	Yes
KOTLI	99.21%	Yes
RAWALAKOT	99.99%	Yes

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

MOBILE BROADBAND SERVICE

4.1. 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. Technology wise 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**.

DESCRIPTION				JAZZ	SCOM	TELENOR	UFONE	ZONG	
AUTO DETECT MODE	CAPACITY TEST	DOWNLOAD	ATTEMPTS	1226	1225	1226	1227	1231	
			SPEED (Mbps)	7.479	4.795	7.122	6.015	19.705	
		UPLOAD	ATTEMPTS	1230	1227	1227	1230	1232	
			SPEED (Mbps)	7.898	11.771	9.186	13.755	22.364	
	DATA TRANSFER TEST	DOWNLOAD	ATTEMPTS	1206	1239	1227	1225	1243	
			SPEED (Mbps)	5.245	4.846	5.105	5.65	9.784	
		UPLOAD	ATTEMPTS	1236	1239	1236	1236	1241	
			SPEED (Mbps)	7.783	8.176	6.031	7.143	9.967	
	BROWSING TEST	ATTEMPTS			4934	4929	4936	4926	4943
		LOADING TIME (Seconds)			6.5	6.99	7.26	6.85	6.09
PING TEST	ATTEMPTS			1244	1245	1244	1245	1245	
	LATENCY (millisecond)			104.93	66.55	101.46	65.34	100.63	
AVERAGE 4G SIGNAL STRENGTH (RSRP) dBm				-85	-84.4	-84.5	-80.1	-83.5	
LOCKED MODE	3G	DATA TRANSFER TEST	DOWNLOAD	ATTEMPTS	N/A	752	N/A		
				SPEED (Mbps)		5.849			
			UPLOAD	ATTEMPTS		754			
				SPEED (Mbps)		1.475			
		PING TEST	ATTEMPTS			764			
			LATENCY (millisecond)			87.49			
		AVERAGE 3G SIGNAL STRENGTH (RSCP) dBm				-71.72			

Table4.1: Data Tests Statistics.

4.2. **4G USER DATA THROUGHPUT.** As per Next Generation Mobile Service (NGMS) licenses and Cellular Mobile Network Quality of Service (QoS) Regulations 2021, licensees are required to meet **the threshold of minimum of 2Mbps of 4G User Data Throughput** in AJK. The results of Data Service QoS KPI i.e. User Data Throughput are shown in **Table4.2: 4G User Data Throughput \geq 2 Mbps**.

City	4G User Data Throughput (Mbps)					Operator Position				
	Jazz	Telenor	Ufone	ZonG	SCOM	Jazz	Telenor	Ufone	ZonG	SCOM
MUZAFARABAD	6.44	7.16	3.93	17.92	5.47	Third	Second	Fifth	First	Fourth
MIRPUR	7.50	9.77	11.98	19.34	4.86	Fourth	Third	Second	First	Fifth
KOTLI	6.52	4.64	4.07	16.42	2.71	Second	Third	Fourth	First	Fifth
RAWALAKOT	8.50	6.07	2.93	22.68	5.47	Second	Third	Fifth	First	Fourth

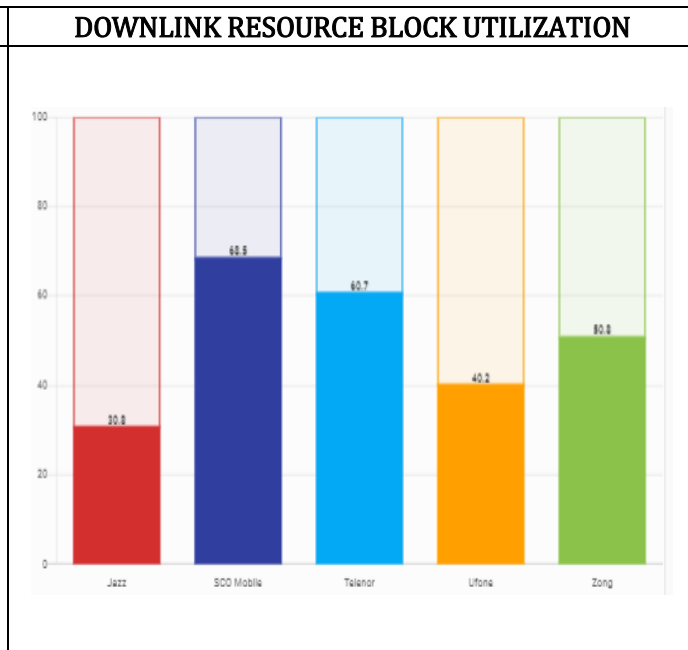
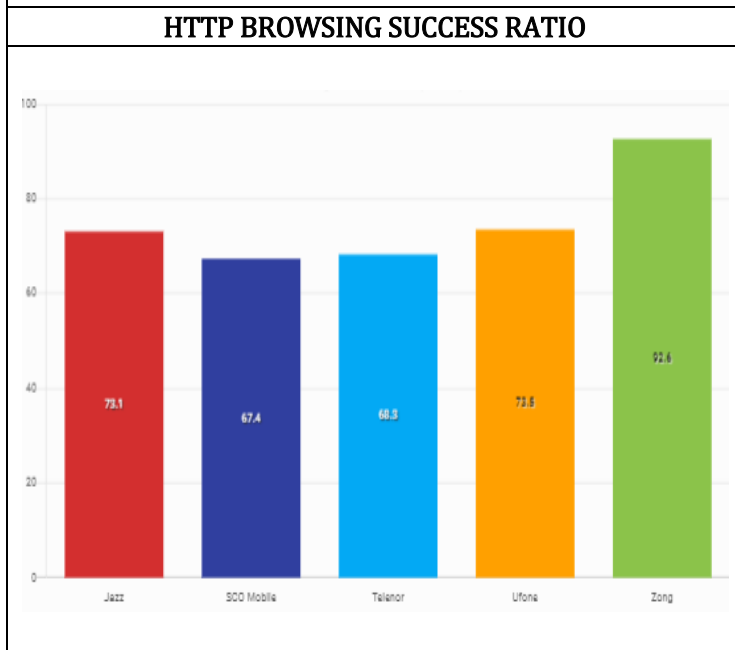
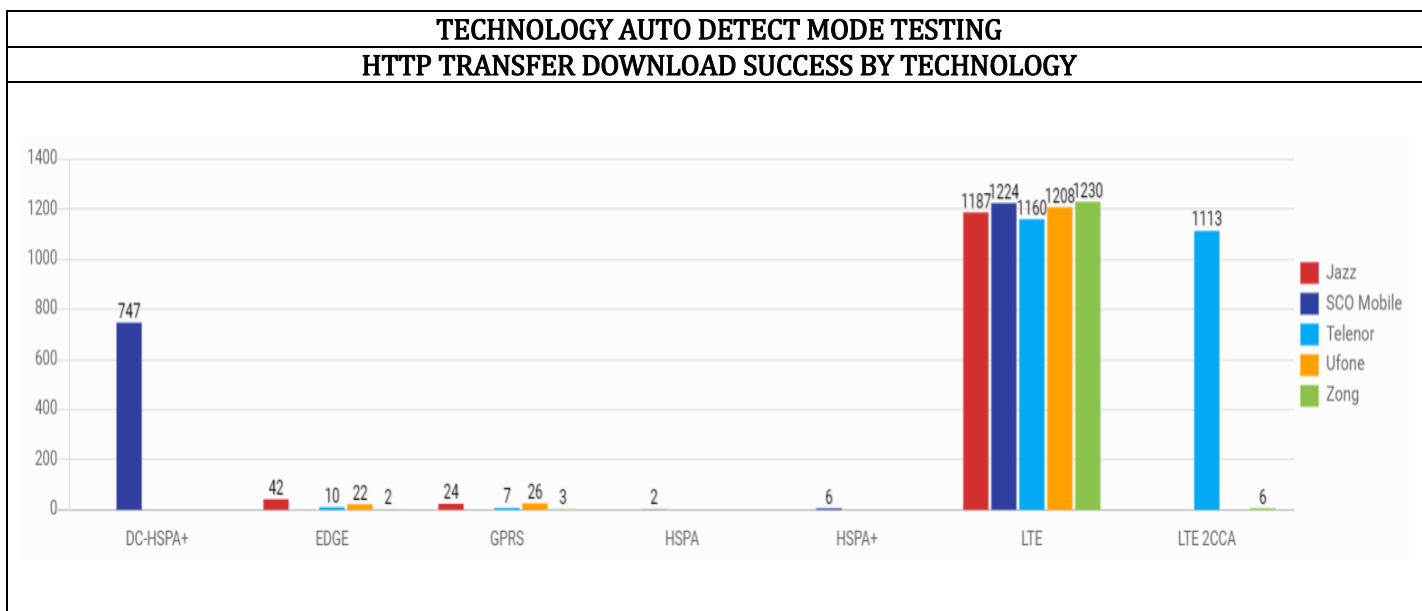
Table4.2: 4G User Data Throughput \geq 2 Mbps

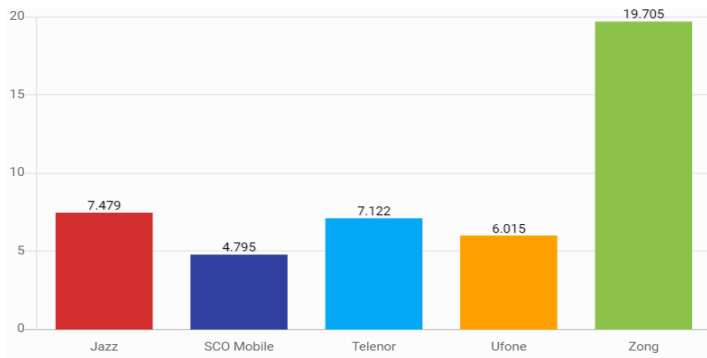
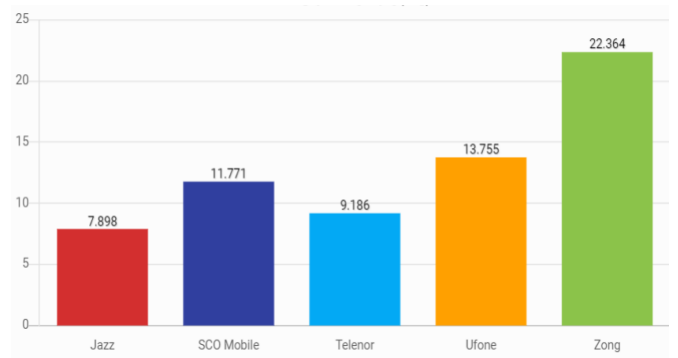
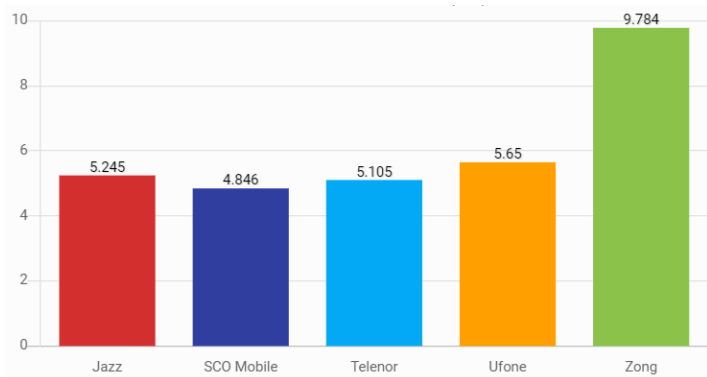
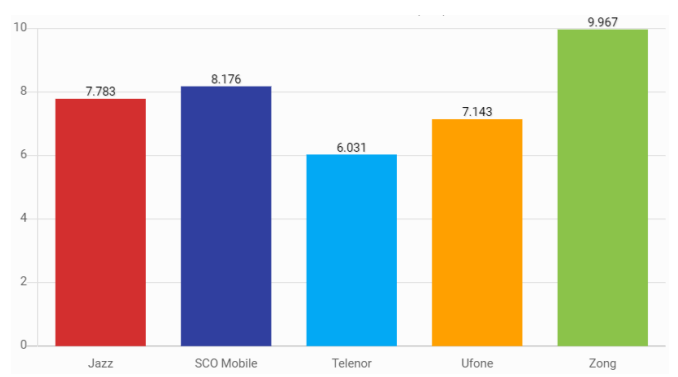
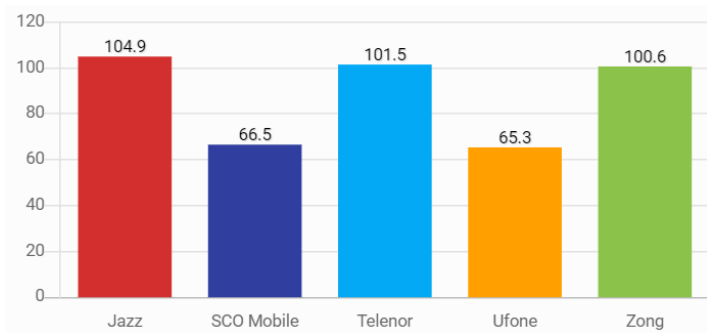
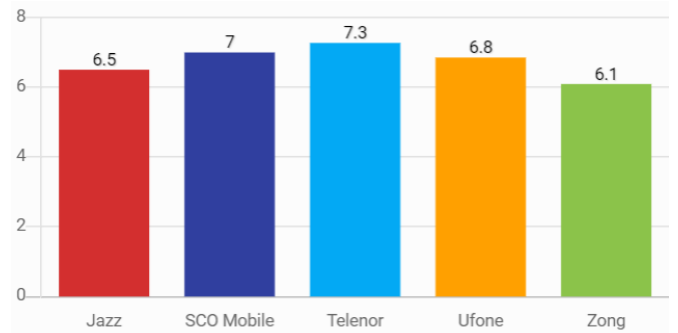
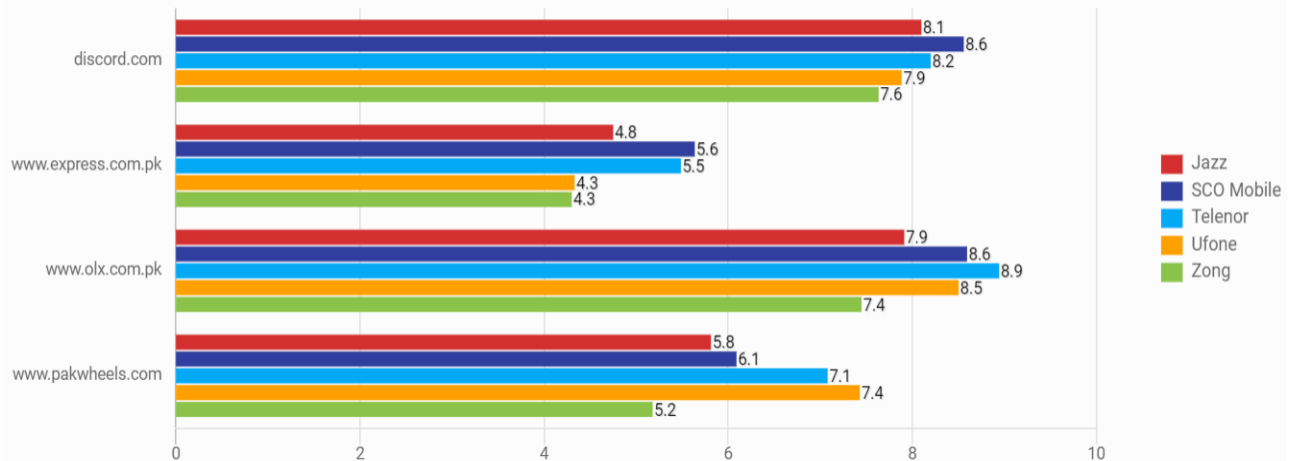
4.3. **3G USER DATA THROUGHPUT.** As per Next Generation Mobile Service (NGMS) licenses and Cellular Mobile Network Quality of Service (QoS) Regulations 2021, licensees are required to meet **the threshold of minimum of 265 Kbps of 3G User Data Throughput.** The results of Data Service QoS KPI i.e. User Data Throughput are shown in **Table4.3: 3G User Data Throughput \geq 256 Kbps.**

City	3G User Data Throughput (Kbps)	Operator Position
	SCOM	SCOM
MUZAFARABAD	5582.53	1 st
MIRPUR	6782.81	
KOTLI	4592.7	
RAWALAKOT	5650.88	

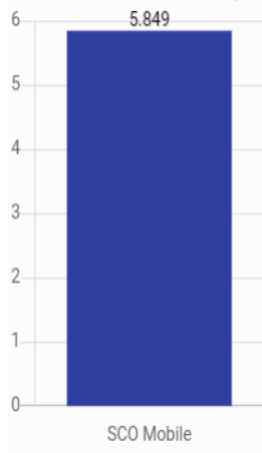
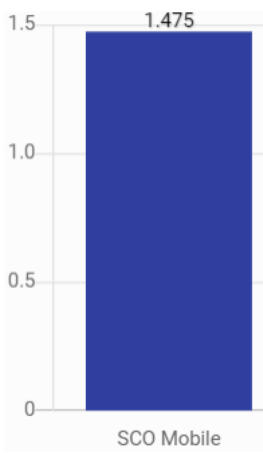
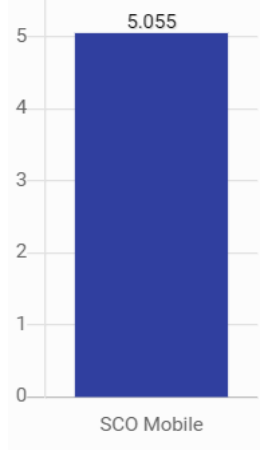
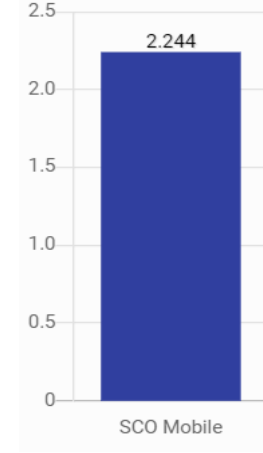
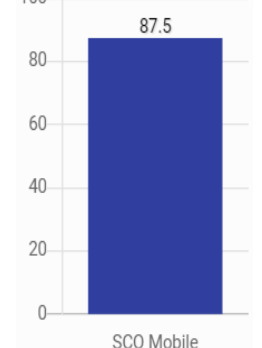
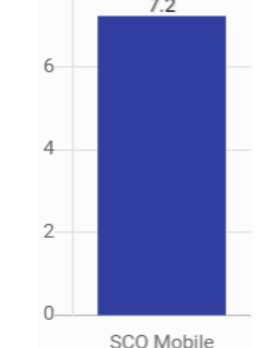
Table4.3: 3G User Data Throughput \geq 265 Kbps

4.4. During the survey, the deployed technologies by Cellular Mobile Operators (CMOs), Success Rate of HTTP Transfer Download Tests, Resource Block Utilization, Latency and Web Page Loading time have been recorded. The details can be seen in attached graphs.



CAPACITY TEST DOWNLOAD SPEED (Mbps)**CAPACITY TEST UPLOAD SPEED (Mbps)****DATA TRANSFER DOWNLOAD SPEED (Mbps)****DATA TRANSFER UPLOAD SPEED (Mbps)****LATENCY (milliseconds)****WEBPAGE LOADING TIME (Seconds)****WEBPAGE LOADING TIME (Seconds)**

3G LOCKED MODE TESTING

CAPACITY TEST DOWNLOAD SPEED (Mbps)	CAPACITY TEST UPLOAD SPEED (Mbps)
 <p>A bar chart with a vertical axis from 0 to 6 and a horizontal axis labeled 'SCO Mobile'. A single blue bar represents the download speed, with the value '5.849' printed above it.</p>	 <p>A bar chart with a vertical axis from 0 to 1.5 and a horizontal axis labeled 'SCO Mobile'. A single blue bar represents the upload speed, with the value '1.475' printed above it.</p>
DATA TRANSFER DOWNLOAD SPEED (Mbps)	DATA TRANSFER UPLOAD SPEED (Mbps)
 <p>A bar chart with a vertical axis from 0 to 5 and a horizontal axis labeled 'SCO Mobile'. A single blue bar represents the data transfer download speed, with the value '5.055' printed above it.</p>	 <p>A bar chart with a vertical axis from 0 to 2.5 and a horizontal axis labeled 'SCO Mobile'. A single blue bar represents the data transfer upload speed, with the value '2.244' printed above it.</p>
LATENCY (milliseconds)	WEBPAGE LOADING TIME (Seconds)
 <p>A bar chart with a vertical axis from 0 to 100 and a horizontal axis labeled 'SCO Mobile'. A single blue bar represents the latency, with the value '87.5' printed above it.</p>	 <p>A bar chart with a vertical axis from 0 to 8 and a horizontal axis labeled 'SCO Mobile'. A single blue bar represents the webpage loading time, with the value '7.2' printed above it.</p>

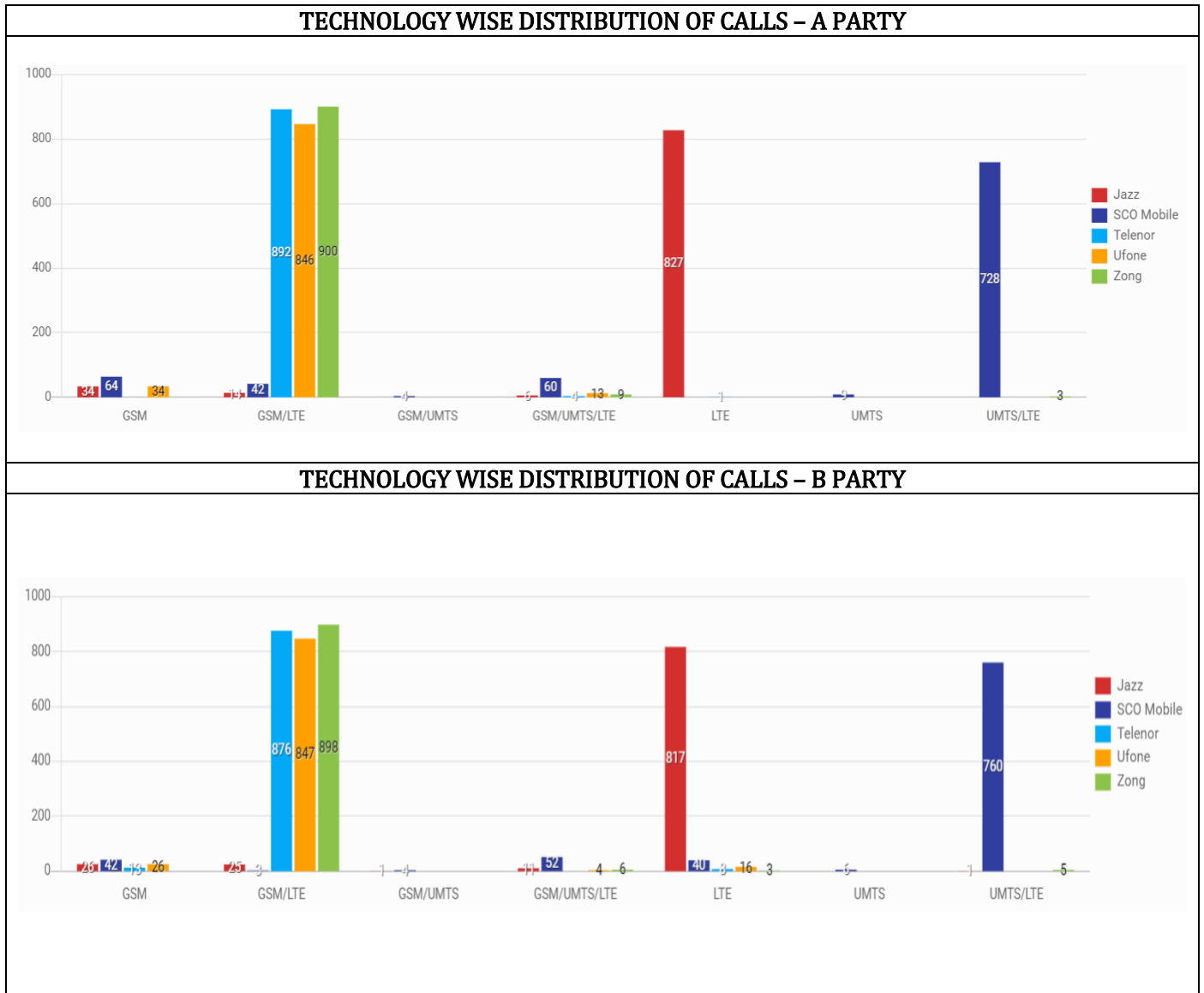
VOICE SERVICE

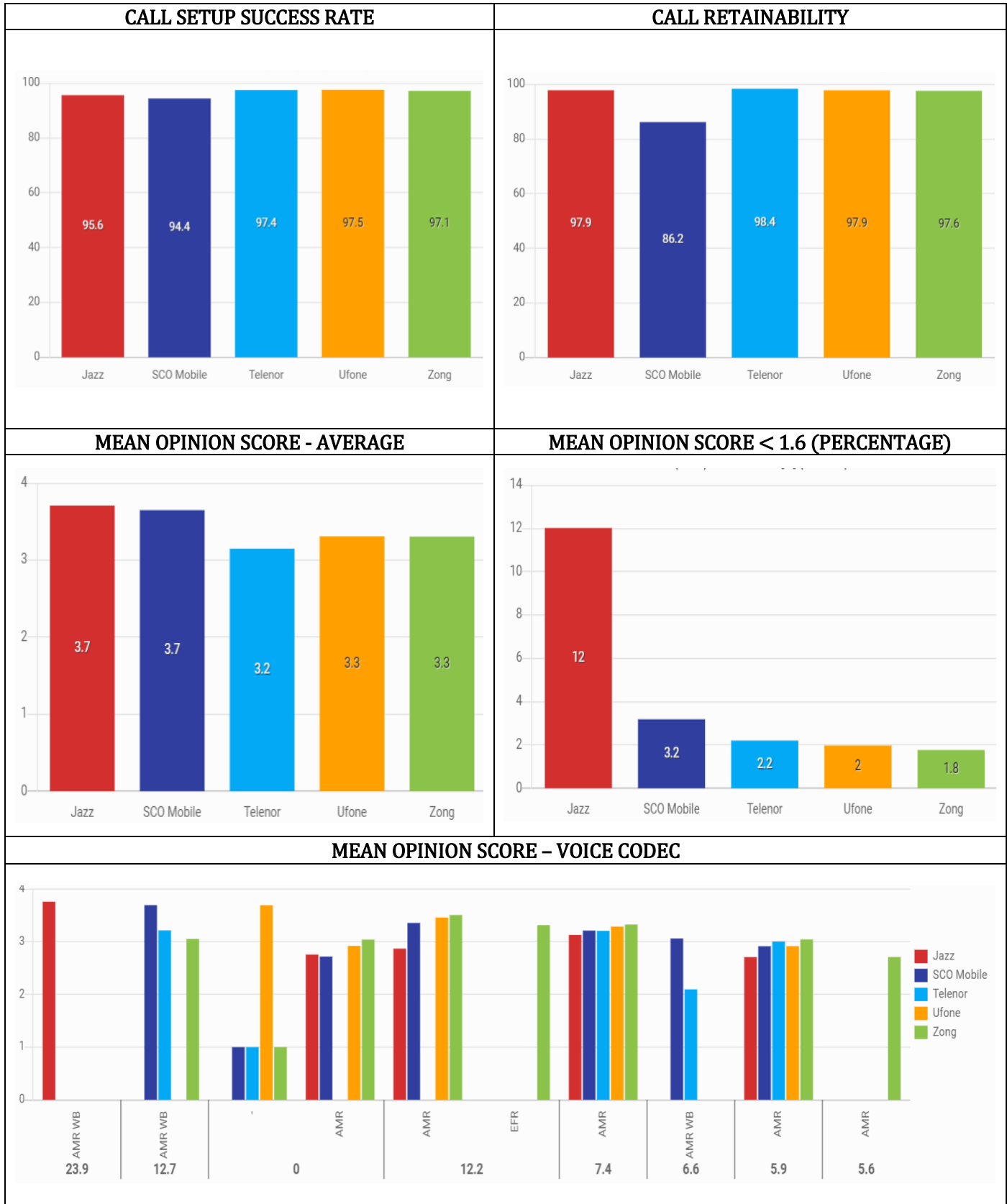
5.1. A total of **4,490 Call attempts** made and out of which **161 were failed attempts**. In **4,329 successful call attempts**, **103 calls dropped** prior to completion of two minutes duration, whereas, **4,226 calls remained connected** for the complete duration of two minutes. The company wise call statistics is shown in **Table5.1: Call Statistics**.

DESCRIPTION	JAZZ	SCOM	TELENOR	UFONE	ZONG
TOTAL CALLS ATTEMPTS	881	907	897	893	912
FAILED CALLS ATTEMPTS	39	51	23	22	26
ESTABLISHED CALLS ATTEMPTS	842	856	874	871	886
DROPPED CALLS ATTEMPTS	32	31	9	2	29
COMPLETED CALLS ATTEMPTS	810	825	865	869	857
CALL SETUP SUCCESS RATE	95.57%	94.38%	97.44%	97.54%	97.15%
CALL SETUP TIME	8.89 s	7.76 s	11.7 s	10.58 s	9.4 s
CALL COMPLETION RATE	97.87%	86.20%	98.41%	97.86%	97.65%
ISHO SUCCESS RATE	-	100%	-	-	-
RAB SETUP SUCCESS RATE	-	99.93%	-	-	100%
MEAN OPINION SCORE (MOS)	3.71	3.65	3.15	3.31	3.31
MOS EXCESS RATIO – MOS < 1.6	12.02%	3.18%	2.20%	1.98%	1.77%
TOTAL SPEECH TEST	8359	8530	8769	8801	8829

Table5.1: Call Statistics

5.2. The overall Call Setup Success Rate and Call Retainability along with Mean Opinion Score (MOS), the percentage of mute calls, MOS with respect to Voice CODEC and Technology per band is shown as under:





5.3. The 7 x QoS KPIs (i.e. Network Accessibility, Call Setup Success Rate, Call Setup Time, Call Completion Rate, Mean Opinion Score, Inter System Handover Success Rate & RAB Setup Success Rate) have been measured while testing voice services in **4 x surveyed cities** of AJK. The compliance level of

threshold values of voice QoS KPIs in 9 x Cities is shown in each **Table 5.3: Voice QoS KPIs Compliance Level**.

<i>Voice Service Cities - Compliance (Yes/No)</i>					
<i>Operator</i>	<i>Voice KPIs</i>	<i>MUZAFARABAD</i>	<i>MIRPUR</i>	<i>KOTLI</i>	<i>RAWALAKOT</i>
<i>Jazz</i>	Network Accessibility	Yes	Yes	Yes	Yes
	Service Accessibility	No	No	No	No
	Call Connection Time	Yes	Yes	Yes	Yes
	Call Completion Ratio	No	No	No	No
	Mean Opinion Score	Yes	Yes	Yes	Yes
<i>Telenor</i>	Network Accessibility	Yes	Yes	Yes	Yes
	Service Accessibility	No	Yes	No	No
	Call Connection Time	No	Yes	Yes	Yes
	Call Completion Ratio	No	Yes	Yes	Yes
	Mean Opinion Score	Yes	Yes	Yes	Yes
<i>Ufone</i>	Network Accessibility	Yes	Yes	Yes	Yes
	Service Accessibility	Yes	No	Yes	No
	Call Connection Time	No	No	No	No
	Call Completion Ratio	Yes	Yes	Yes	Yes
	Mean Opinion Score	Yes	Yes	Yes	Yes
<i>ZonG</i>	Network Accessibility	Yes	Yes	Yes	Yes
	Service Accessibility	No	No	Yes	Yes
	Call Connection Time	No	Yes	Yes	No
	Call Completion Ratio	No	No	No	Yes
	Mean Opinion Score	Yes	Yes	Yes	Yes
<i>SCOM</i>	Network Accessibility	Yes	Yes	Yes	Yes
	Service Accessibility	No	Yes	No	No
	Call Connection Time	Yes	Yes	Yes	Yes
	Call Completion Ratio	No	No	No	No
	Mean Opinion Score	Yes	Yes	Yes	Yes
	Inter System Hand Over	Yes	Yes	Yes	Yes
	RAB Setup Success Rate	Yes	Yes	Yes	Yes

Voice QoS KPIs Thresholds: Network Accessibility (NA) > 99%, Service Accessibility (SA) > 98%, Call Connection Time (CCT) < 7.5 Seconds, Call Completion Ratio (CCR) > 98%, Mean Opinion Score (MOS) > 3, Inter System Hand Over (ISHO) > 98% & RAB Setup Success Rate (RSSR) > 98%

Table 5.3: Voice QoS KPIs Compliance Level

SMS SERVICE

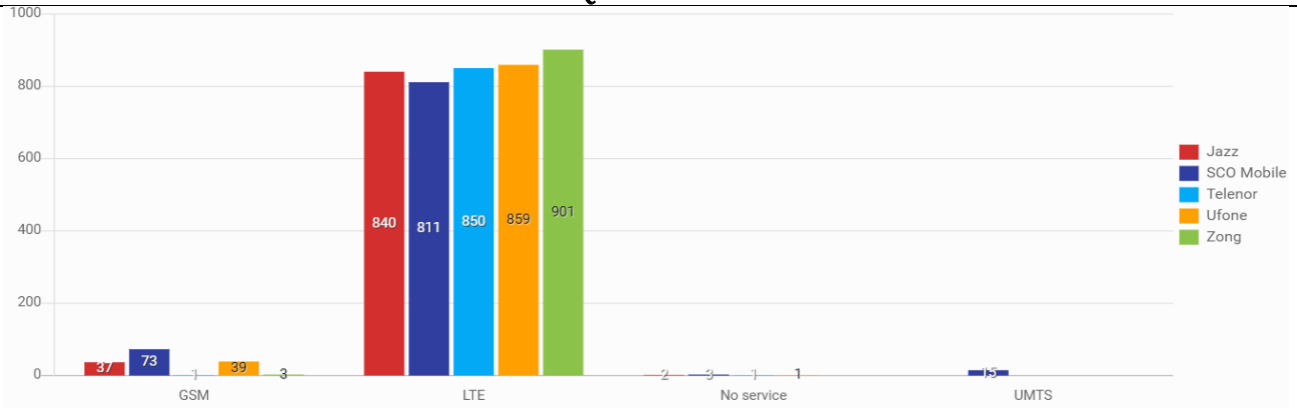
6.1. A total of **4,436 SMS sending attempts** conducted, out of which **4,336 SMS successfully received** at B-Party. The company wise SMS Statistics are shown in **Table 6.1: SMS Statistics**

DESCRIPTION	JAZZ	SCOM	TELENOR	UFONE	ZONG
SMS SEND REQUEST	879	902	852	899	904
SMS SUCCESSFULLY RECEIVED	834	887	820	892	903
SMS RECEIVE SUCCESS RATE	94.88%	98.34%	96.24%	99.22%	99.89%
END-TO-END DELIVERY TIME	5.03 s	2.22 s	7.87 s	4.57 s	2.41 s

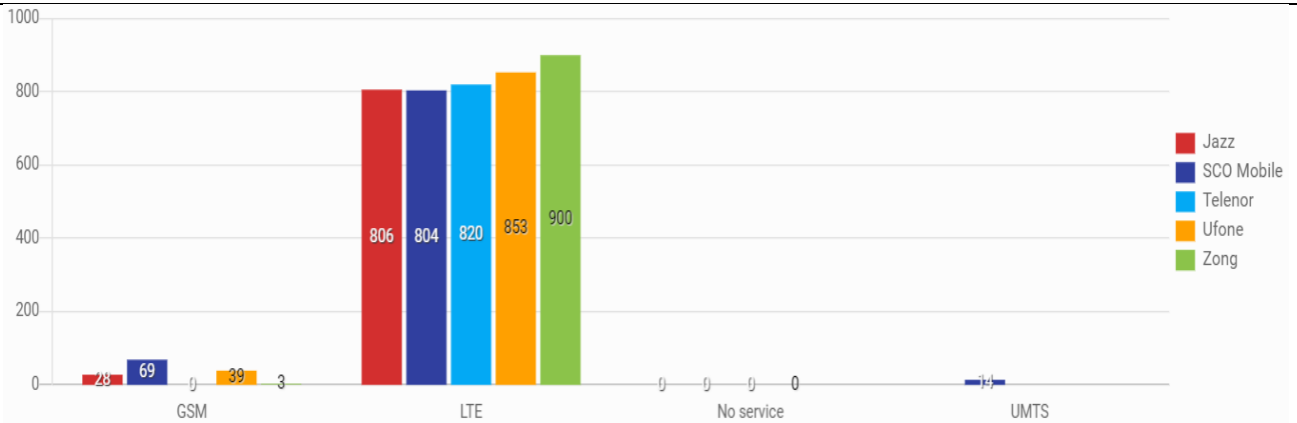
Table 6.1: SMS Statistics

6.2. The SMS Send Request & Successful Reception by Technology, Average Success Rate & End to End Delivery Time and Delivery Duration by Technology are shown in the graphs.

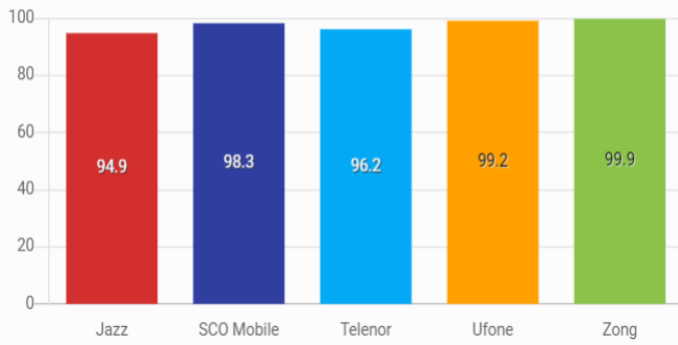
SMS SEND REQUEST BY TECHNOLOGY



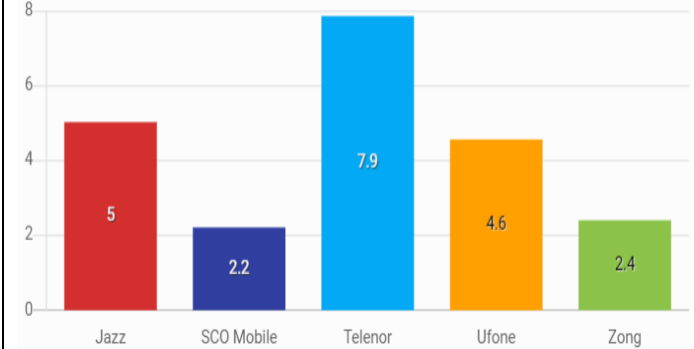
SMS SUCCESSFUL RECEPTION BY TECHNOLOGY



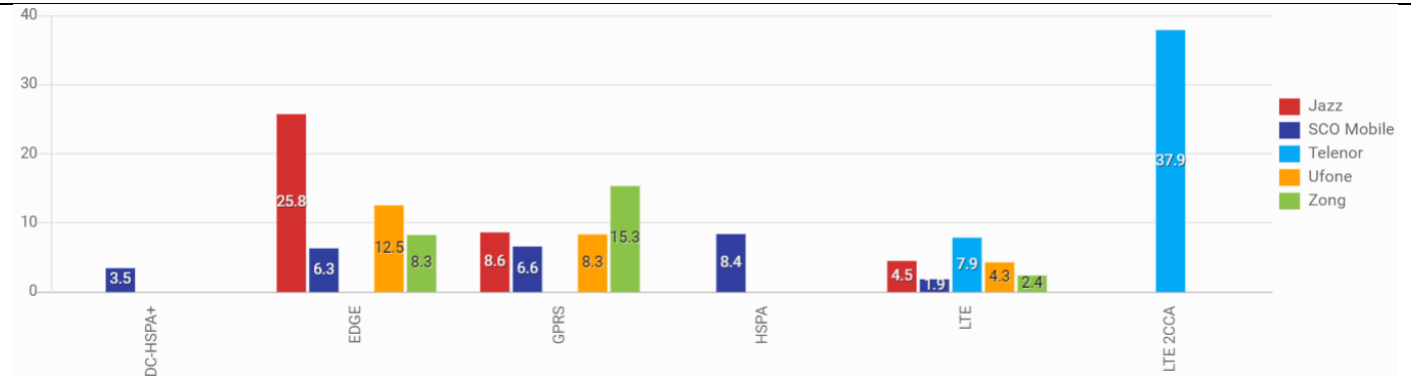
SMS RECEIVE SUCCESS RATE (%)



SMS END TO END DELIVERY TIME (SECONDS)



SMS DELIVERY DURATION BY TECHNOLOGY



SURVEY MAPS & GRAPHICAL RESULTS

7.1 The 4G/LTE (RSRP) and 3G (RSCP) Signal Strength samples recorded during drive test on survey routes and plotted on maps. The Signal Strength maps are attached as **Annex-A (Coverage Maps)** while the Voice & SMS QoS KPIs survey results in graphical form are shown at **Annex-B (QoS Results)**.

STANDING IN SURVEY

8.1. CMOs have been prioritized/ placed at 1st, 2nd, 3rd, 4th & 5th position in each category i.e. Mobile Network Coverage, Mobile Broadband Service and Voice Service based on the compliance level against each QoS KPI in each category in **4 x surveyed cities**.

- a. **MOBILE NETWORK COVERAGE.** The categorization of CMOs as per QoS KPI i.e. Signal Strength of 4G/LTE Networks measured in Technology Auto Detect is shown in **Table 8.1: CMOs Standing in Technology Auto Detect Mode Mobile Network Coverage**. While the Signal Strength of 3G Networks measured in Technology Auto Detect is shown in **Table 8.2: CMOs Standing in 3G Locked Mode Mobile Network Coverage**

S. #.	Operator	Compliance Level – Number of Cities Technology Auto Detect Mode		Standing
		Compliant	Non-Compliant	
1.	Ufone	4	0	1 st
2.	ZonG	4	0	1 st
3.	Telenor	4	0	1 st
4.	SCOM	4	0	1 st
5.	Jazz	3	0	2 nd

Table 8.1: CMOs Standing in Technology Auto Detect Mode Mobile Network Coverage

S. #.	Operator	Compliance Level – Number of Cities 3G Locked Mode		Standing
		Compliant	Non-Compliant	
1.	SCOM	4	0	1 st
2.	ZonG	N/A		
3.	Telenor			
4.	Ufone			
5.	Jazz			

Table 8.2: CMOs Standing in 3G Locked Mode Mobile Network Coverage

- b. **MOBILE BROADBAND SERVICE.** The categorization of each CMOs, as per the highest to lowest obtained User Data Throughput in 4G/LTE Networks is shown in **Table 8.3: CMOs Standing in Mobile Broadband Service**.

S. #.	Operator	Highest Throughput – Number of Cities					Standing
		1 st	2 nd	3 rd	4 th	5 th	
1.	ZonG	4	-	-	-	-	1 st
2.	Jazz	-	2	1	1	-	2 nd
3.	Telenor	-	1	3	-	-	3 rd
4.	Ufone	-	1	-	1	2	4 th
5.	SCOM	-	-	-	2	2	5 th

Table 8.3: CMOs Standing in Mobile Broadband Service

- c. **VOICE SERVICE.** The categorization of each CMOs, as per the maximum compliant of Voice QoS KPIs is shown in **Table 8.4: CMOs Standing in Voice Service.**

S. #.	Operator	Voice QoS KPIs		Standing
		Compliant	Non-Compliant	
1.	SCOM	21	7	1 st
2.	Telenor	15	5	1 st
3.	Ufone	14	6	2 nd
4.	ZonG	13	7	3 rd
5.	Jazz	12	8	4 th

Table 8.4: CMOs Standing in Voice Service

- d. **OVERALL STANDING.** The overall standing of each CMOs in different category of services is mentioned in **Table 8.5: CMOs Overall Standing in QoS Survey.**

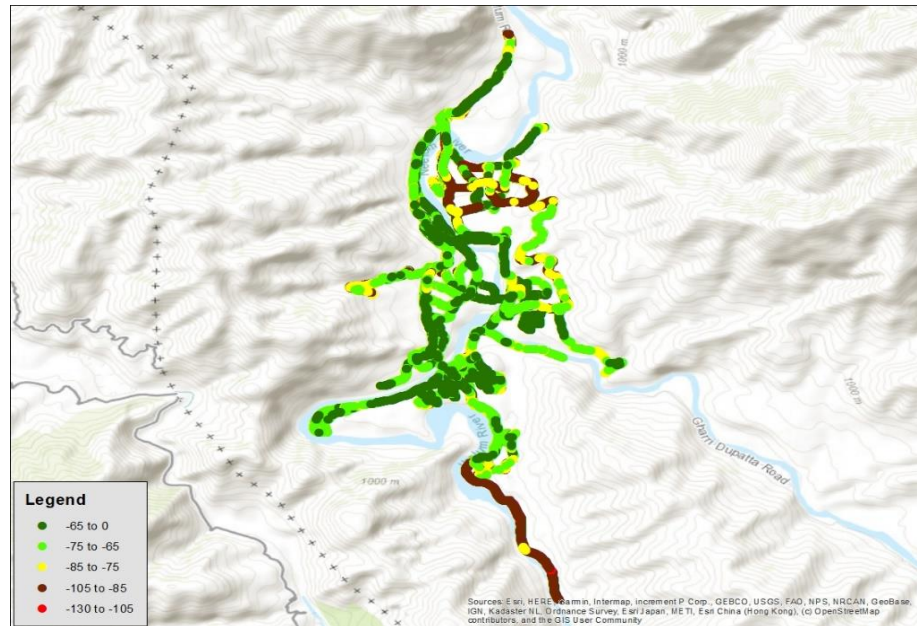
S. #.	Service		STANDING				
			1 st	2 nd	3 rd	4 th	5 th
1.	Auto Mode	Network Coverage	Ufone, ZonG, Telenor, SCOM	Jazz	-	-	
	3G Locked Mode		SCOM	-	-	-	-
2.	Auto Mode	Mobile	ZonG	Jazz	Telenor	Ufone	SCOM
	3G Locked Mode	Broadband	SCOM	-	-	-	-
3.	Voice		SCOM, Telenor	Ufone	ZonG	Jazz	-

Table 8.5: CMOs Overall Standing in QoS Survey

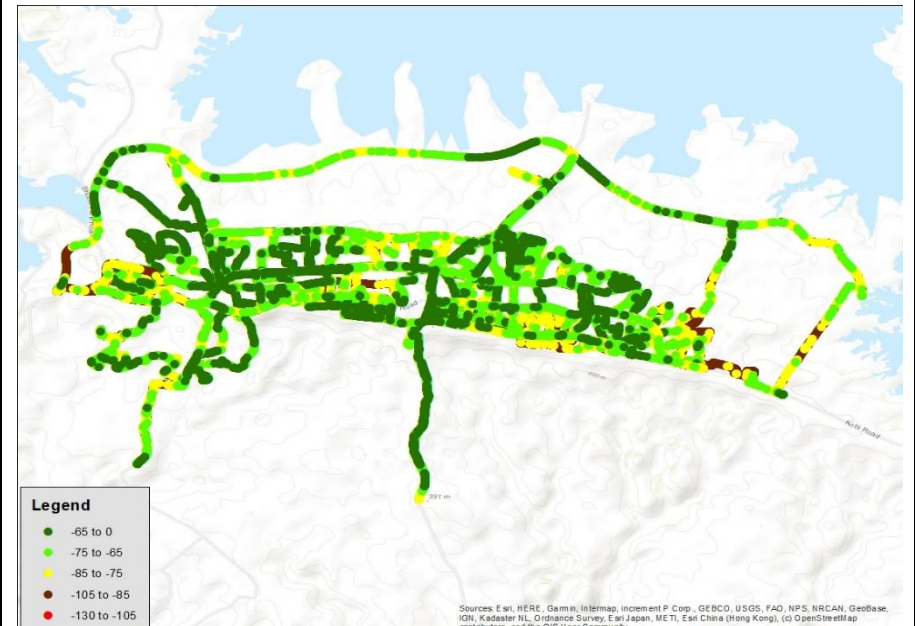
DATA 3G LOCKED MODE

3G MOBILE COVERAGE – SIGNAL STRENGTH (RSCP)

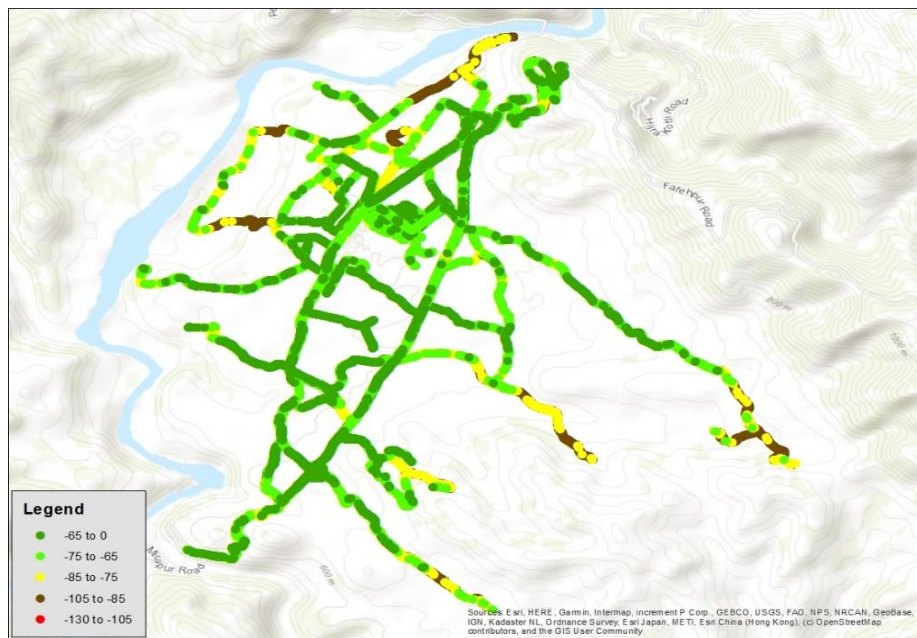
SCOM 3G NETWORK COVERAGE – MUZAFFARABAD



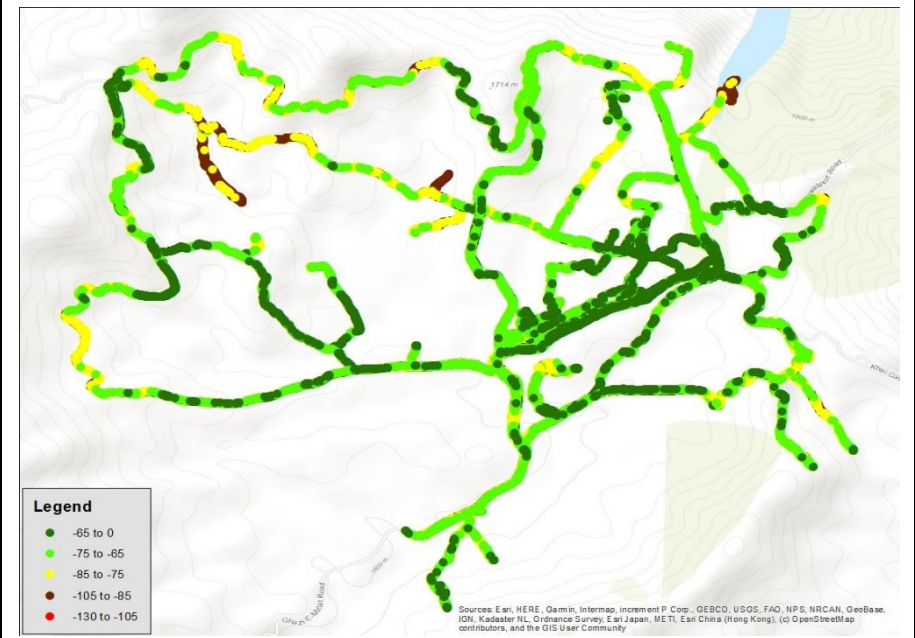
SCOM 3G NETWORK COVERAGE – MIRPUR



SCOM 3G NETWORK COVERAGE – KOTLI



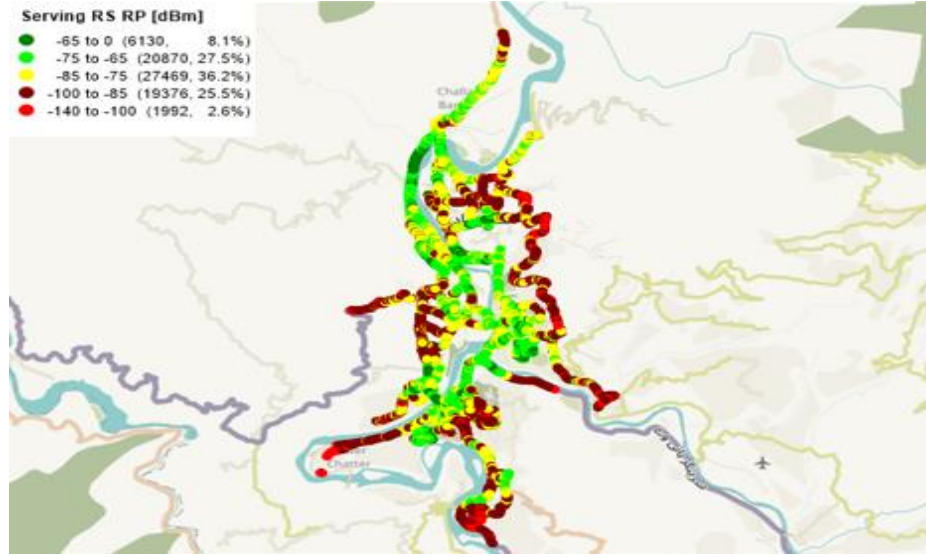
SCOM 3G NETWORK COVERAGE – RAWLAKOT



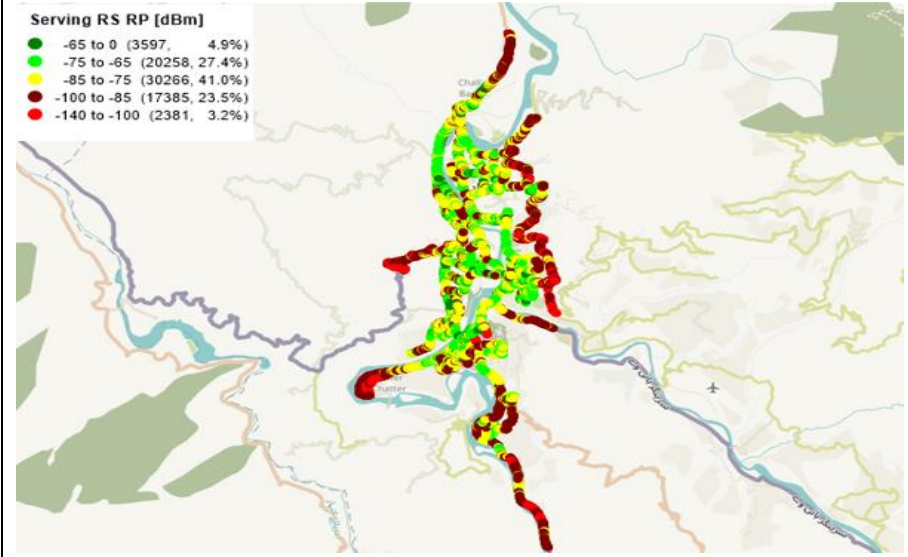
DATA AUTOMODE

4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

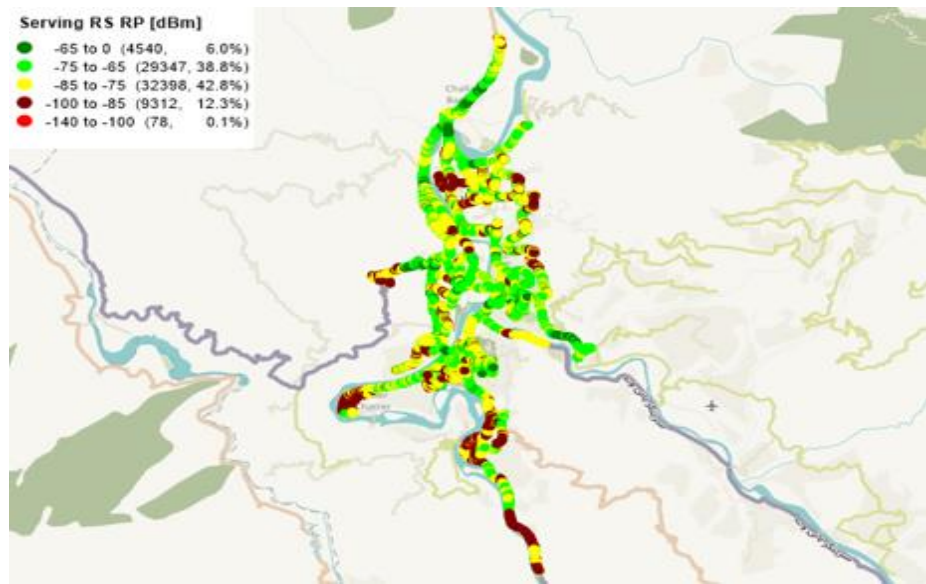
JAZZ AUTOMODE NETWORK COVERAGE – MUZAFFARABAD



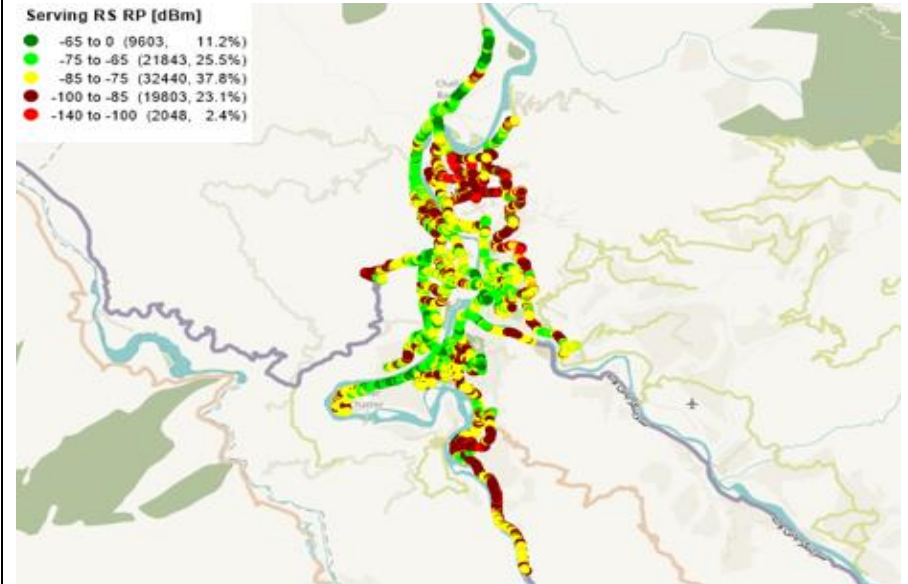
TELENOR AUTOMODE NETWORK COVERAGE – MUZAFFARABAD



UFONE AUTOMODE NETWORK COVERAGE – MUZAFFARABAD

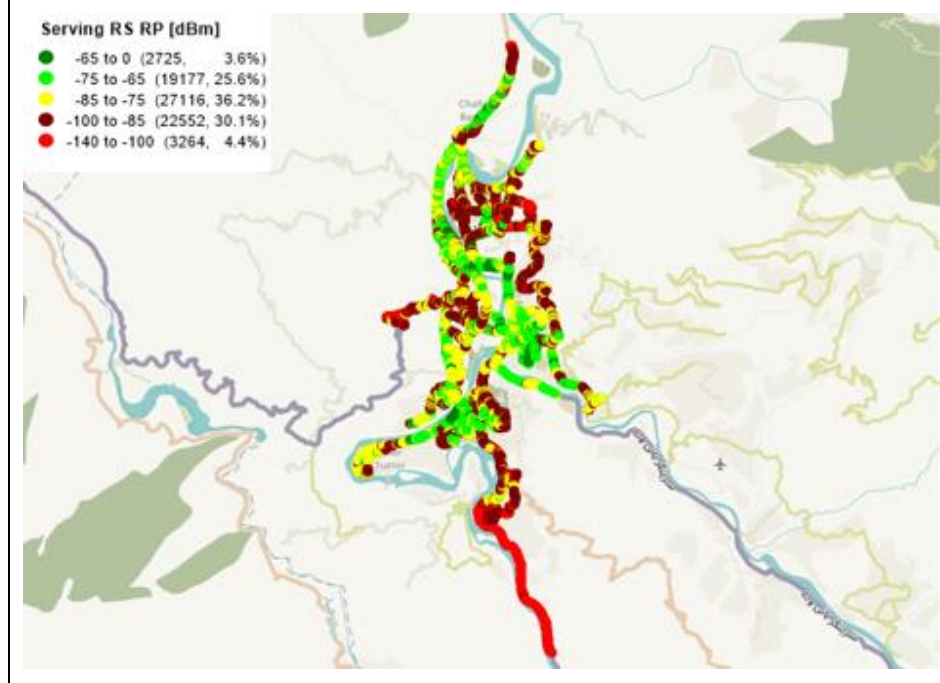


ZONG AUTOMODE NETWORK COVERAGE – MUZAFFARABAD



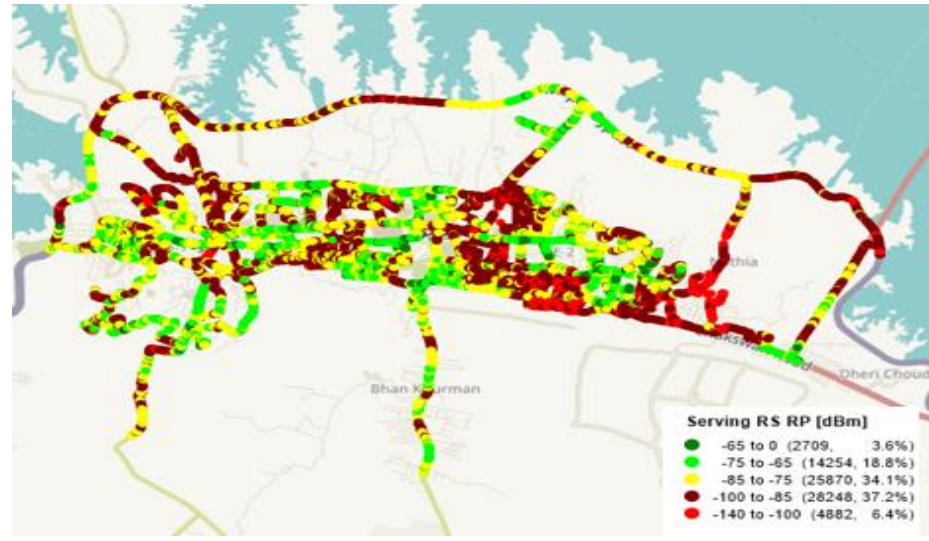
4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

SCO 4G NETWORK COVERAGE – MUZAFFARABAD

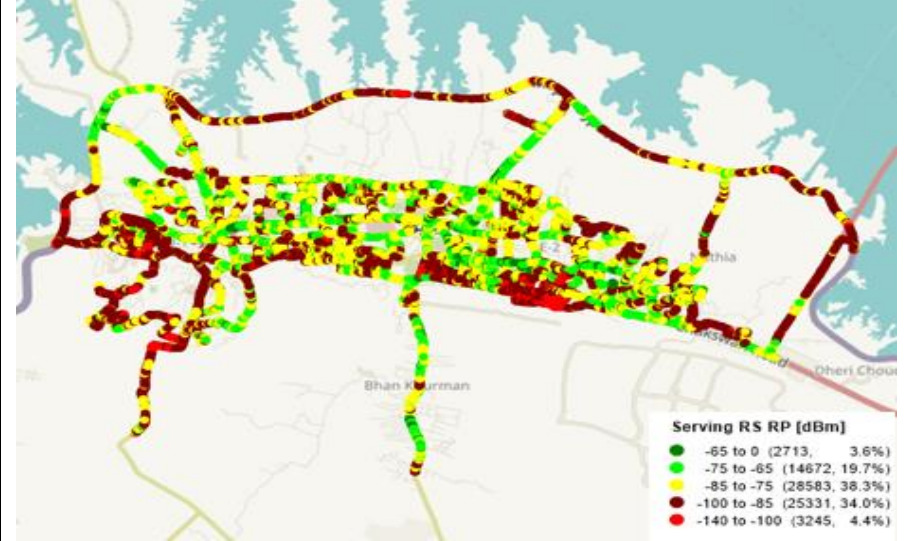


4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

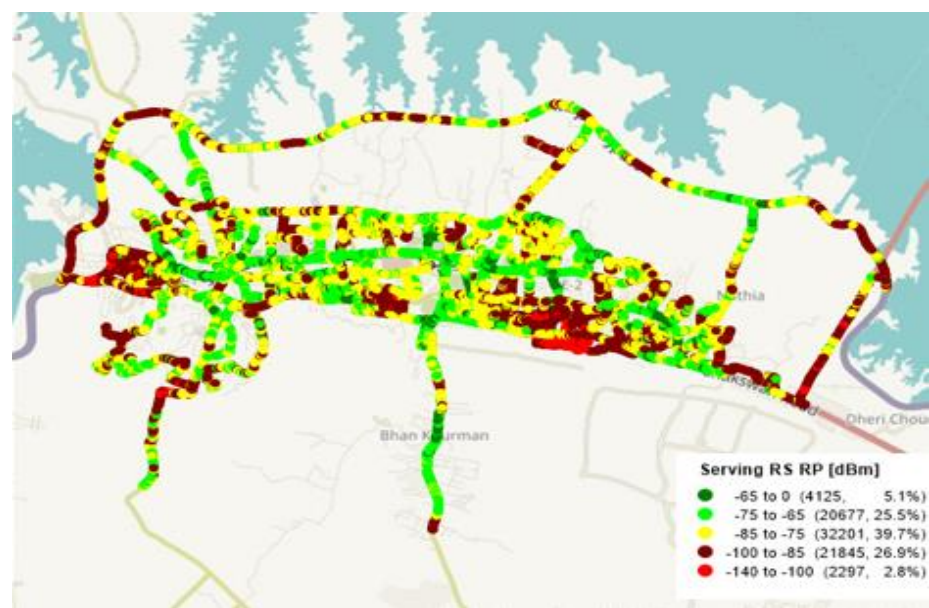
JAZZ 4G NETWORK COVERAGE – MIRPUR



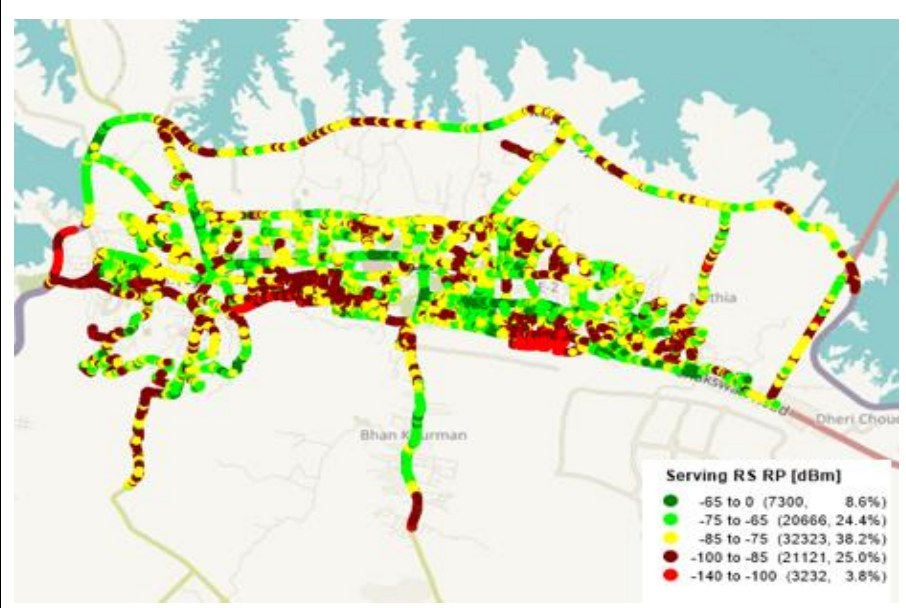
TELENOR 4G NETWORK COVERAGE – MIRPUR



UFONE 4G NETWORK COVERAGE – MIRPUR

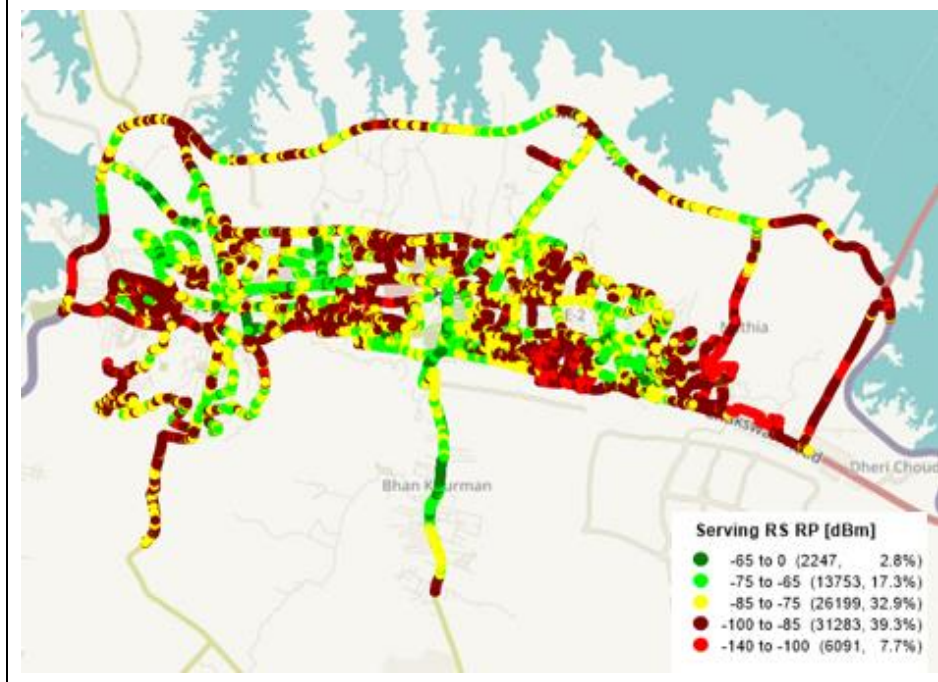


ZONG 4G NETWORK COVERAGE – MIRPUR



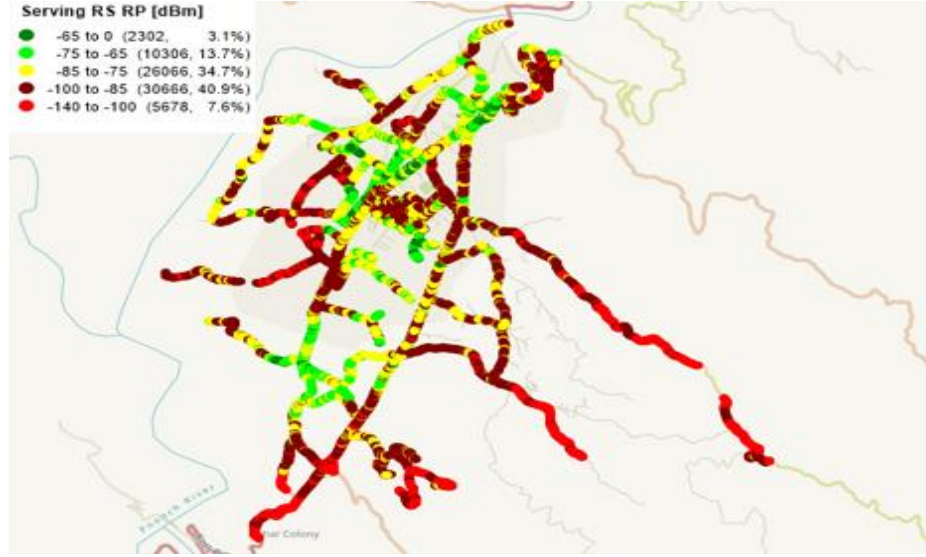
4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

SCO 4G NETWORK COVERAGE – MIRPUR

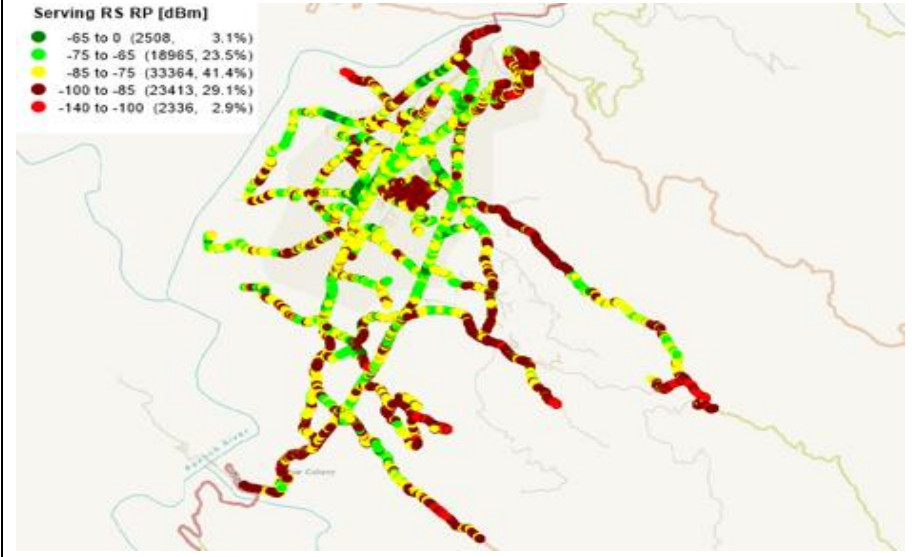


4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

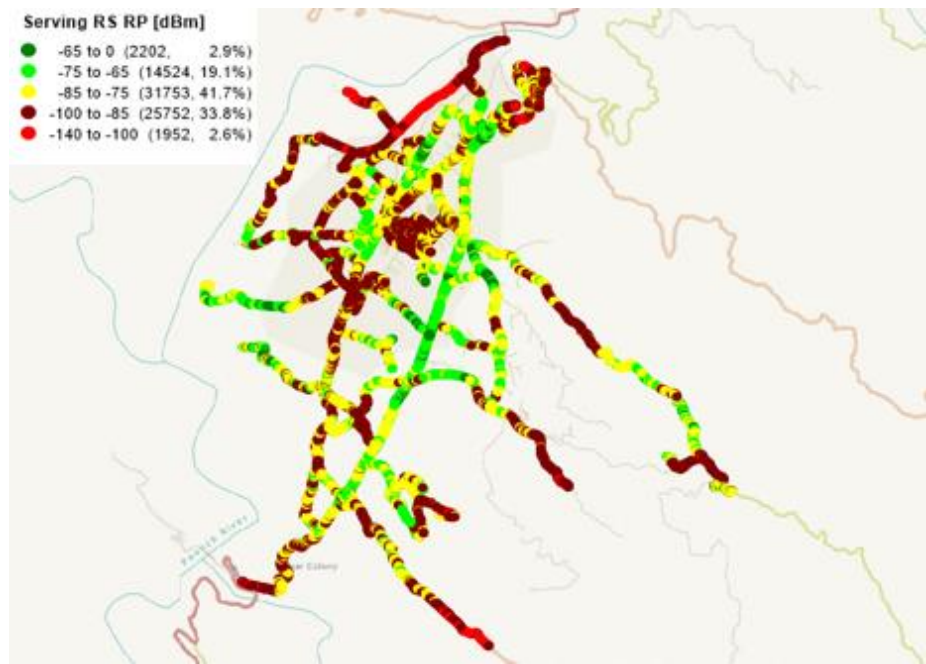
JAZZ 4G NETWORK COVERAGE – KOTLI



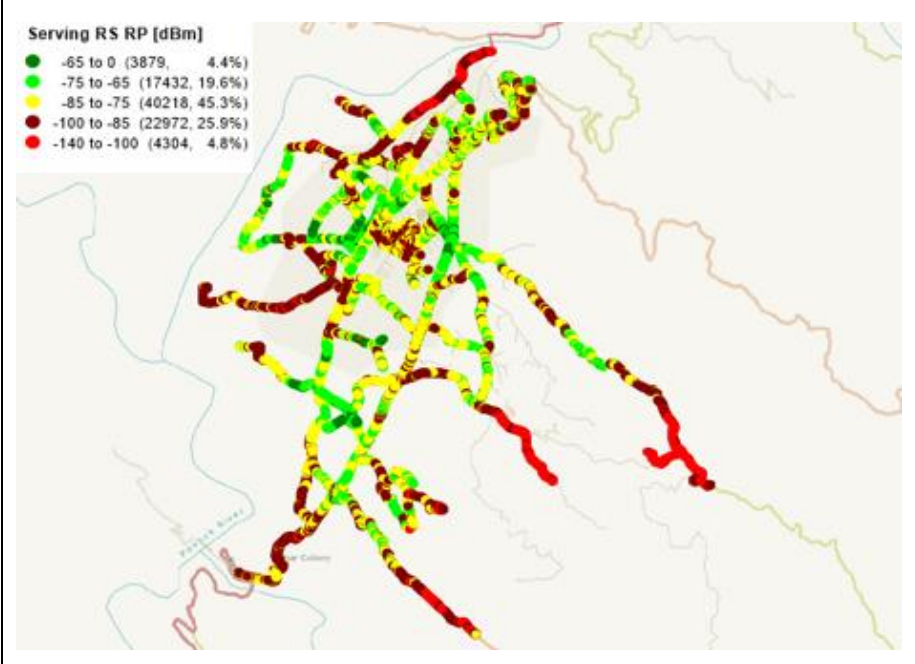
TELENOR 4G NETWORK COVERAGE – KOTLI



UFONE 4G NETWORK COVERAGE – KOTLI

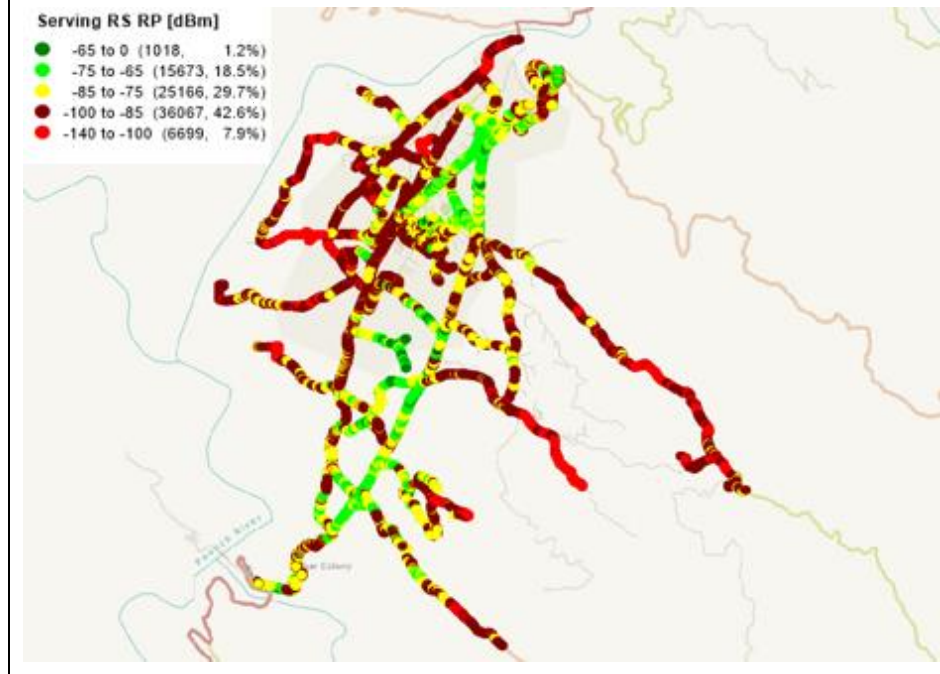


ZONG 4G NETWORK COVERAGE – KOTLI



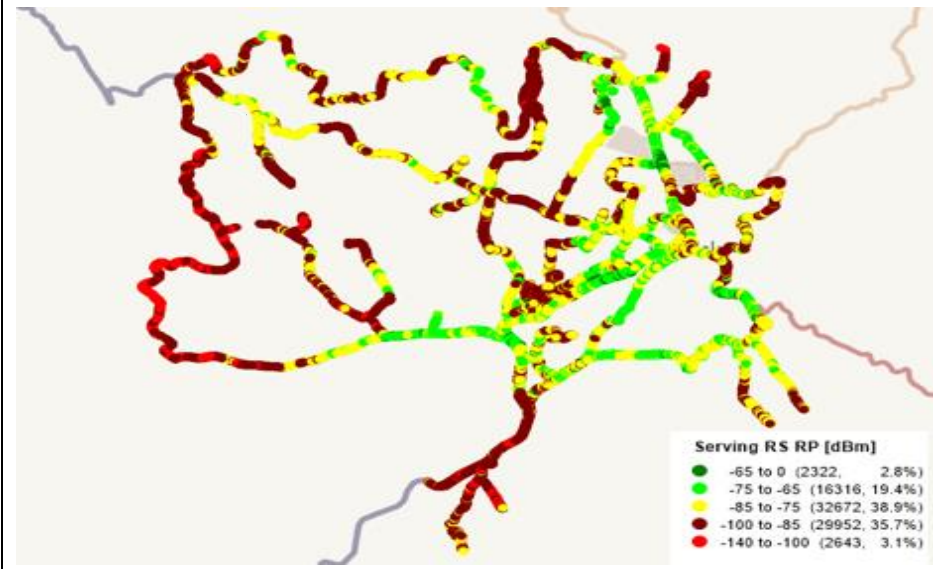
4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

SCO 4G NETWORK COVERAGE – KOTLI

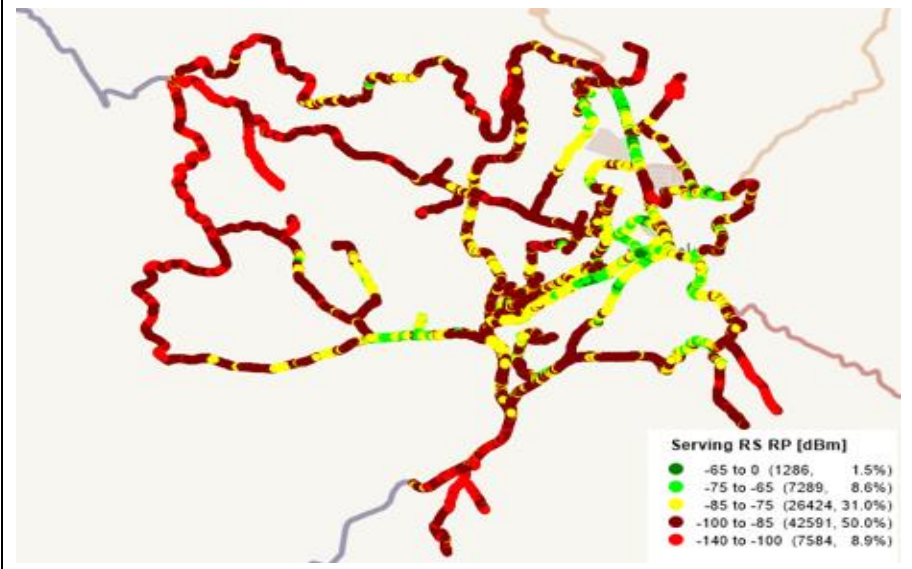


4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

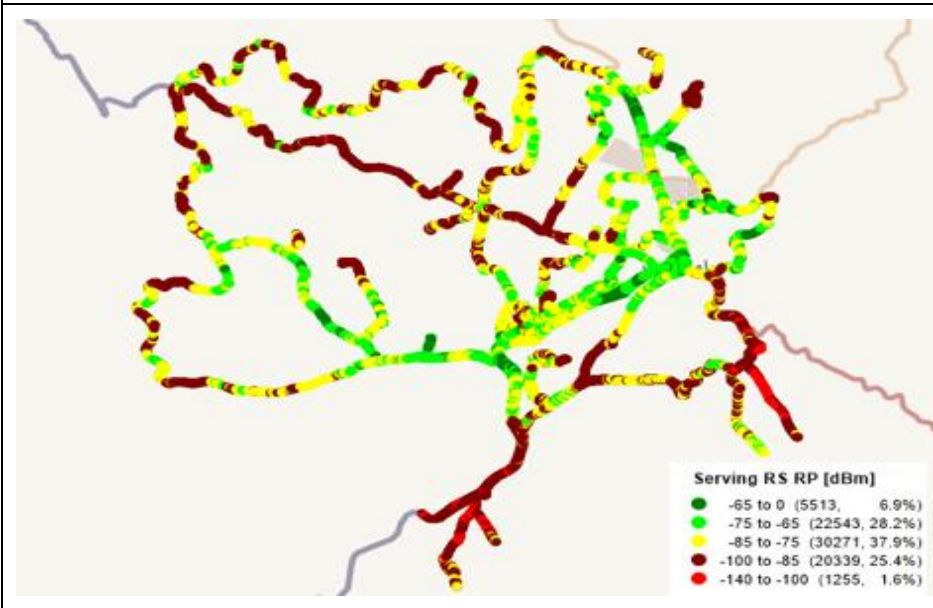
JAZZ 4G NETWORK COVERAGE – RAWLAKOT



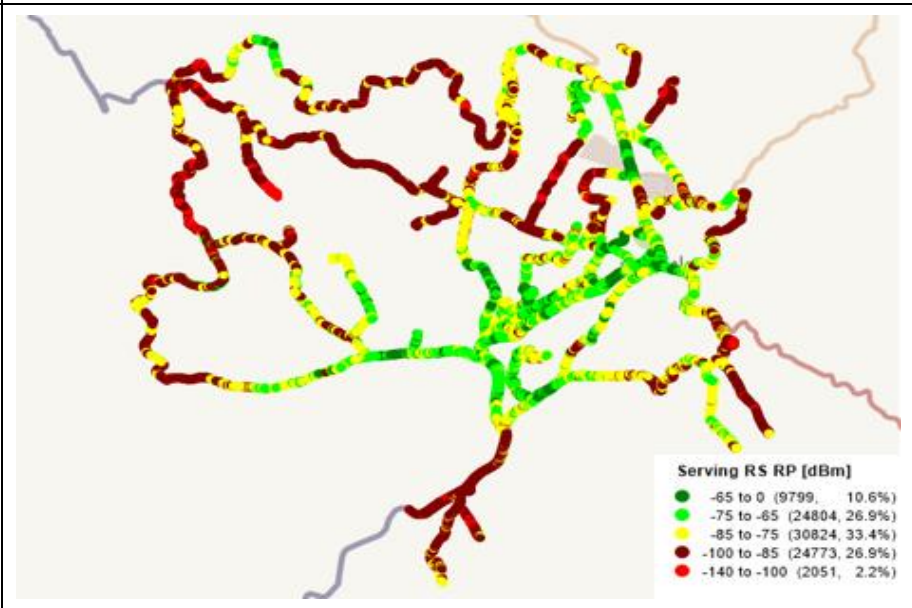
TELENOR 4G NETWORK COVERAGE – RAWLAKOT



UFONE 4G NETWORK COVERAGE – RAWLAKOT

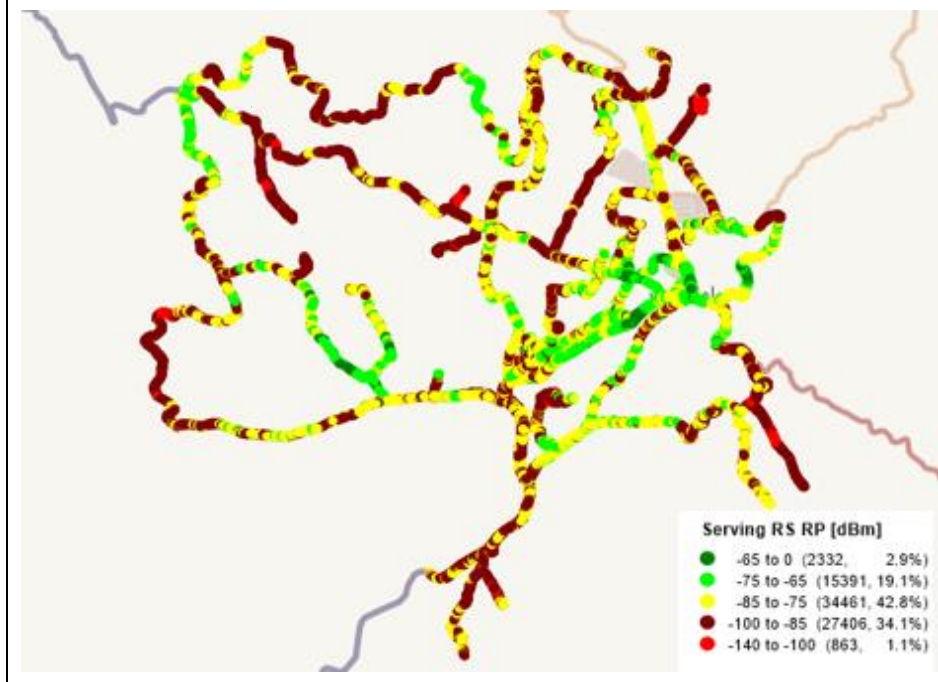


ZONG 4G NETWORK COVERAGE – RAWLAKOT



4G MOBILE COVERAGE – SIGNAL STRENGTH (RSRP)

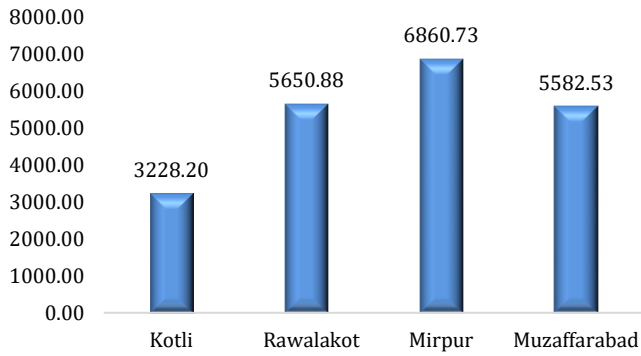
SCO 4G NETWORK COVERAGE – RAWLAKOT



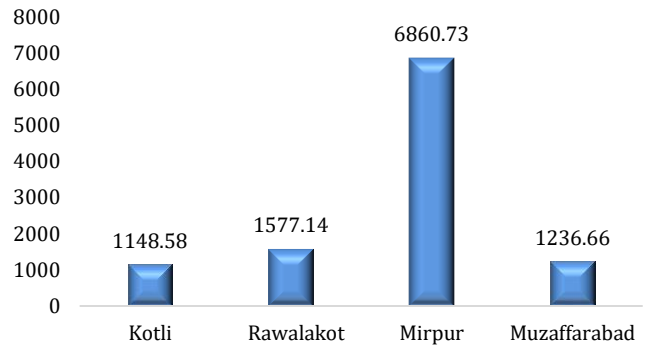
3G DATA LOCKED MODE

QUALITY OF SERVICE SURVEY- SCOM RESULTS (3G)

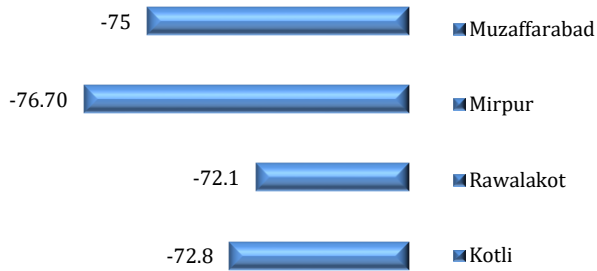
User Data Throughput (3G) > 256Kbps



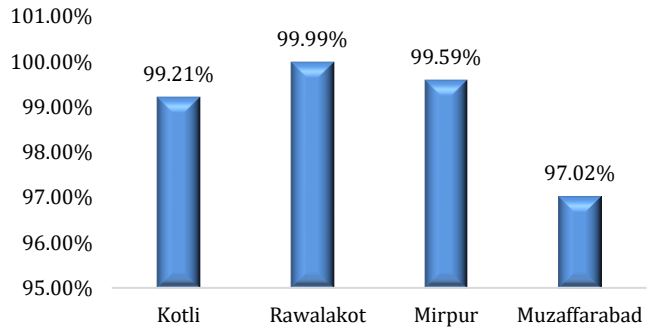
User Data Throughput (3G) > 64 Kbps



3G Signal Strength (RSCP) > -100dBm

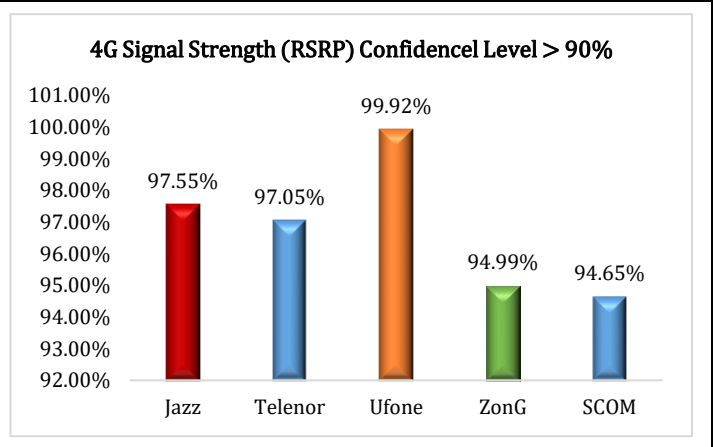
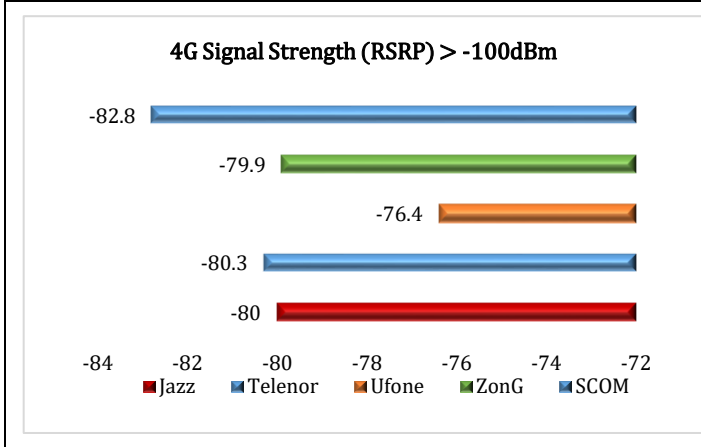
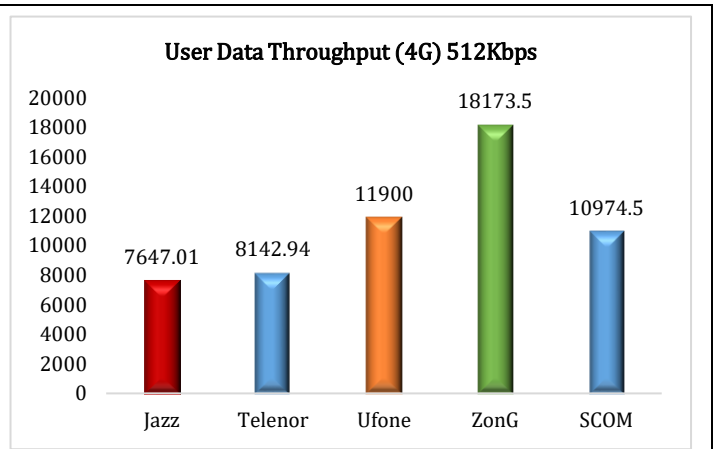
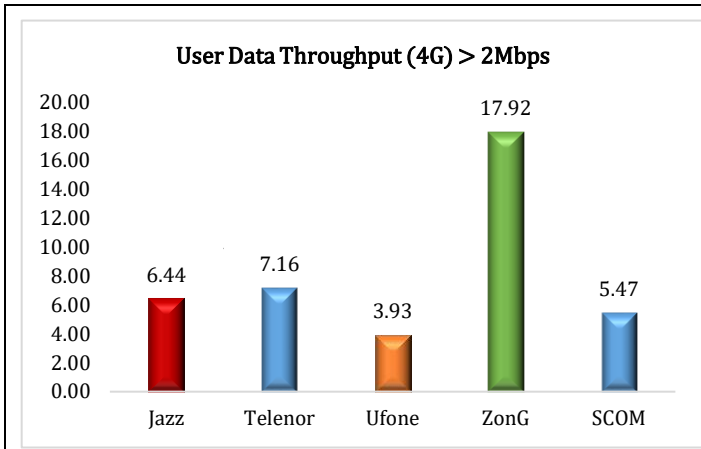


3G Signal Strength (RSCP) Confidence Level > 90%

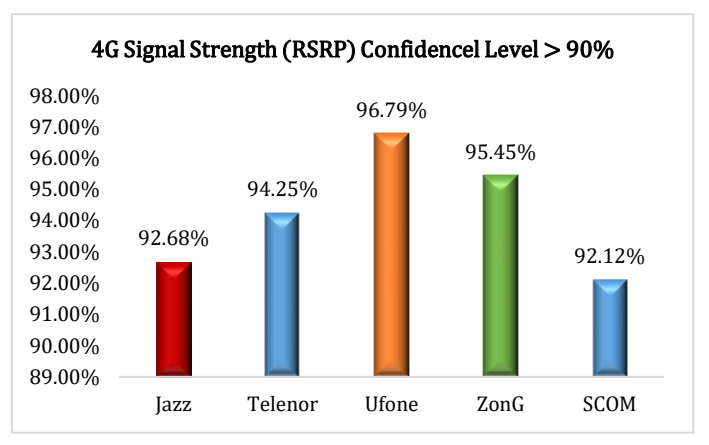
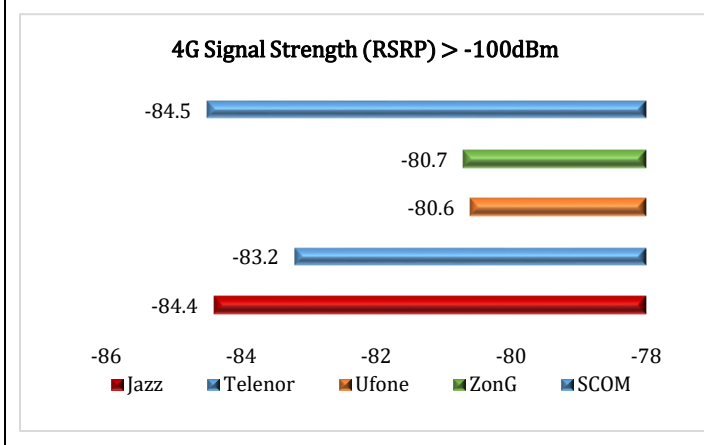
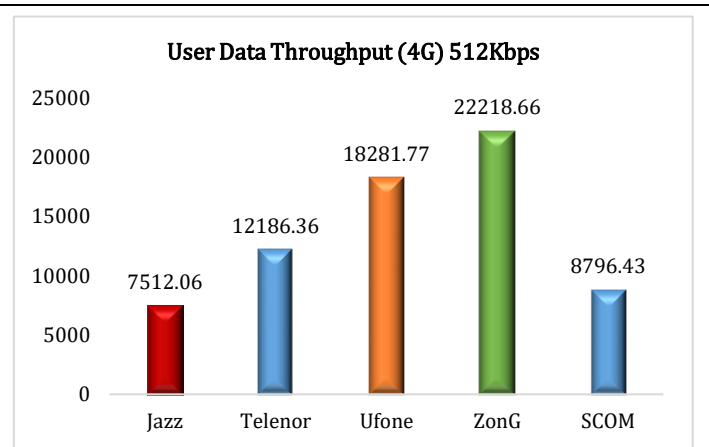
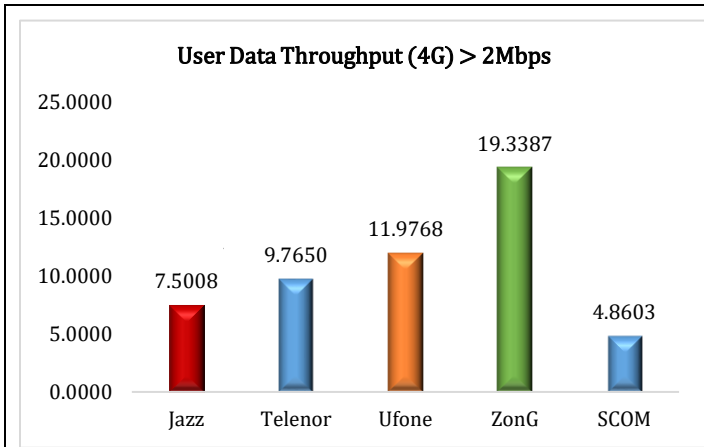


DATA AUTOMODE

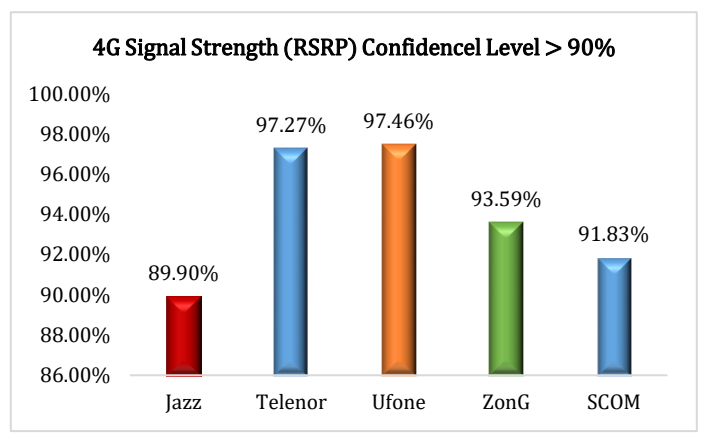
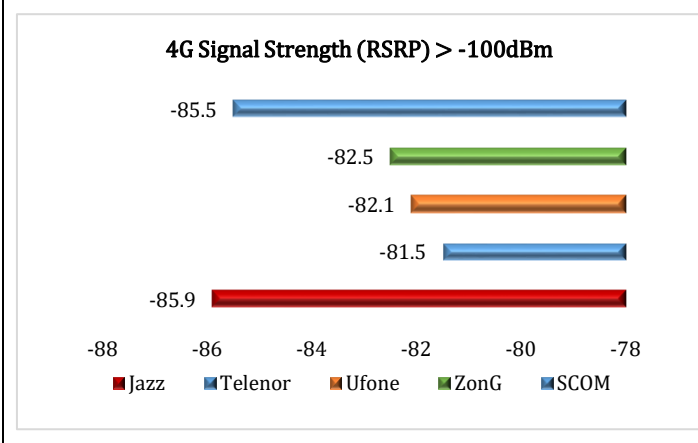
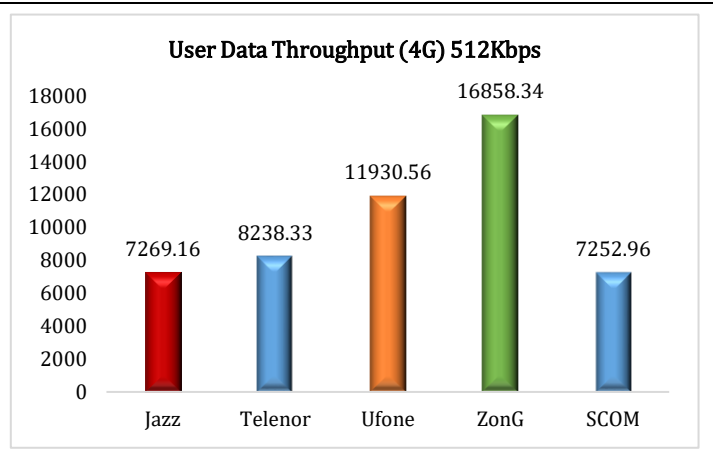
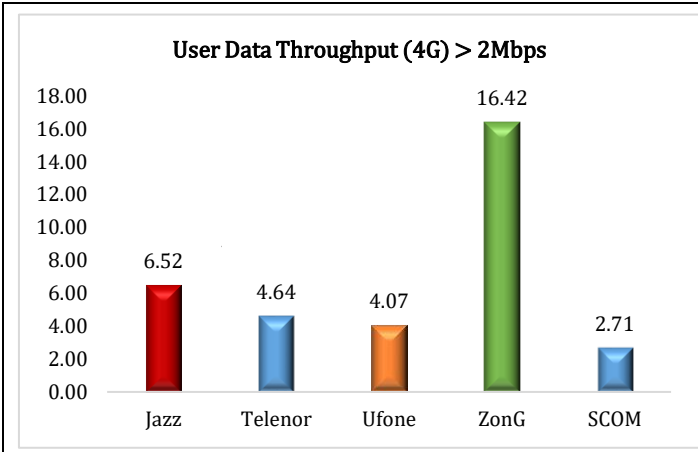
QUALITY OF SERVICE SURVEY RESULTS (4G) – MUZAFFARABAD



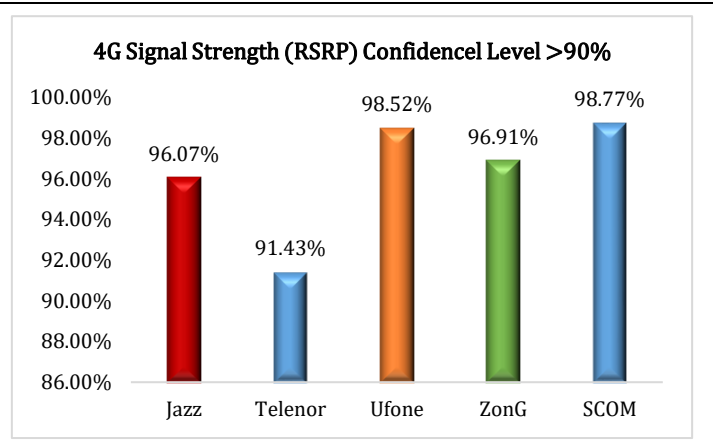
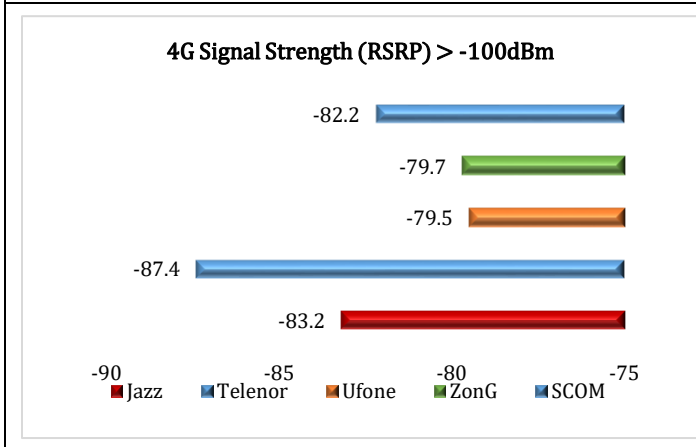
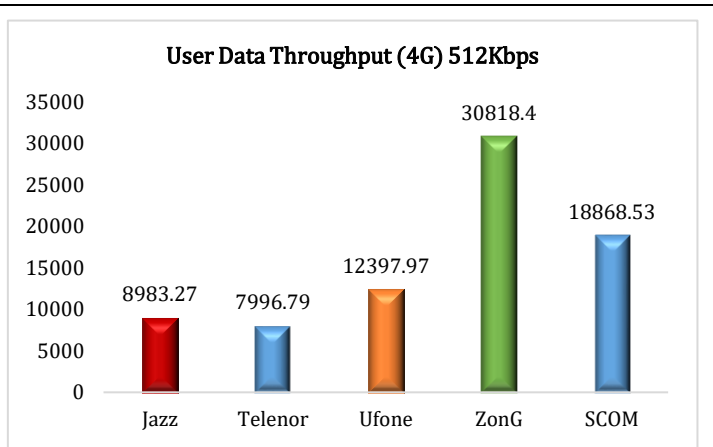
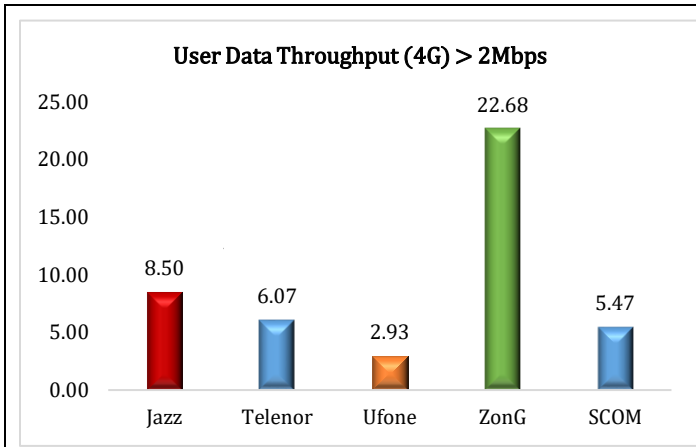
QUALITY OF SERVICE SURVEY RESULTS (4G) – MIRPUR



QUALITY OF SERVICE SURVEY RESULTS (4G) –KOTLI

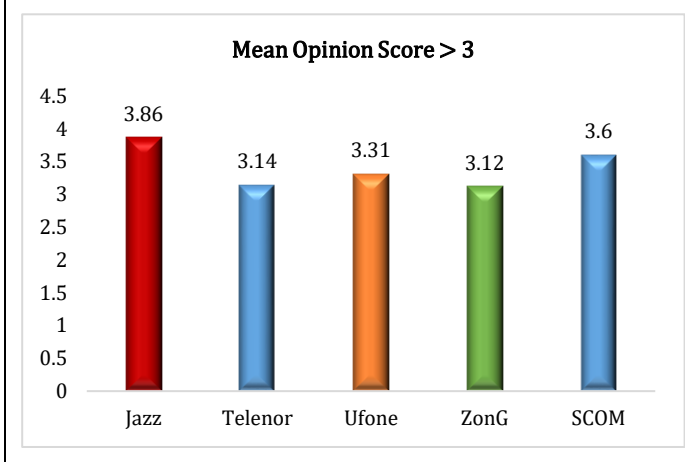
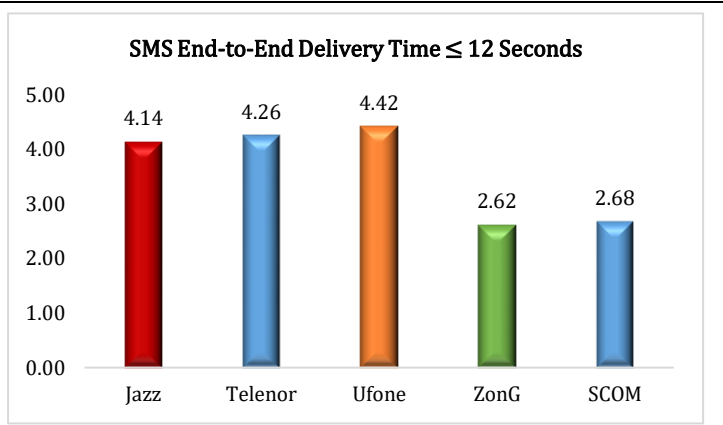
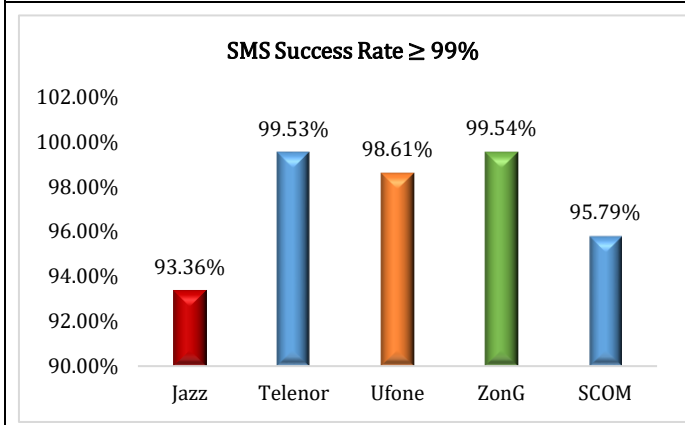
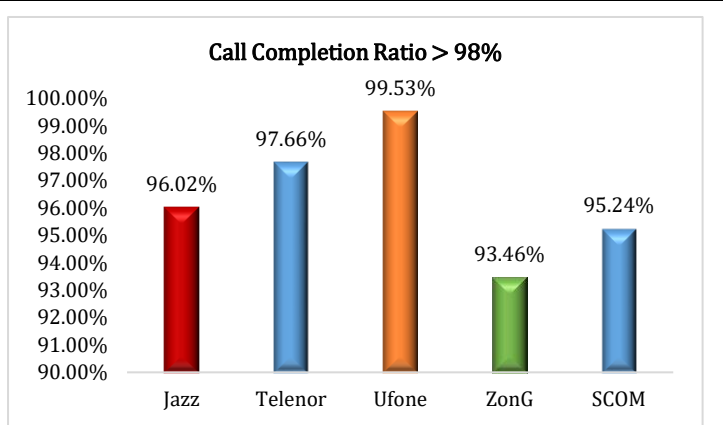
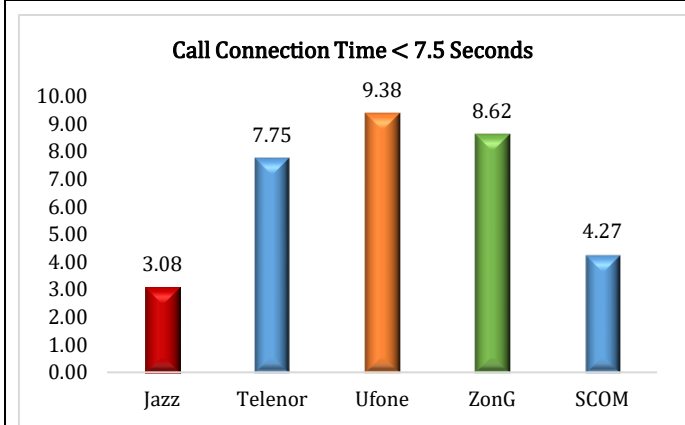
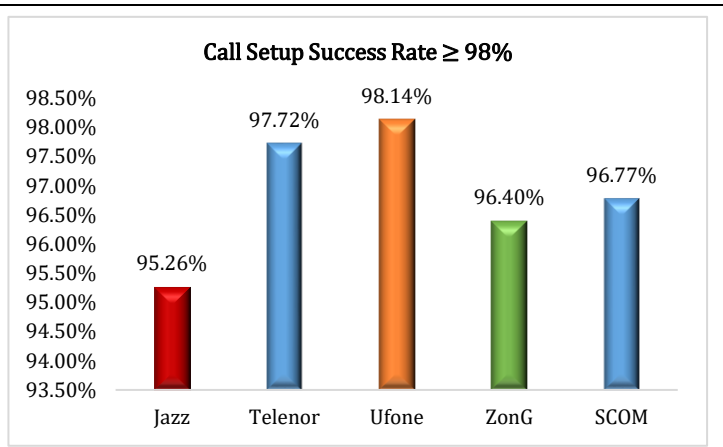
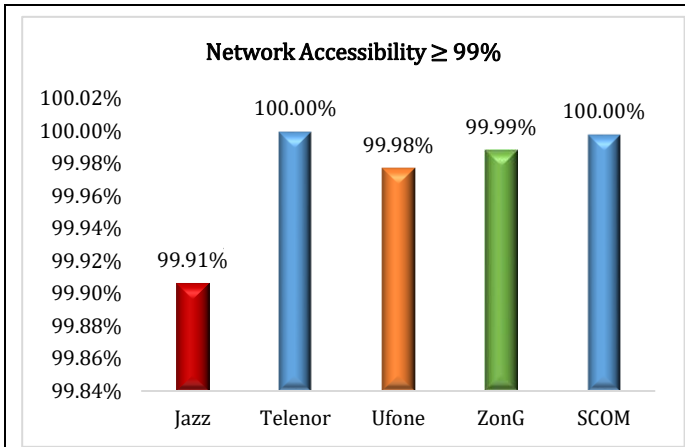


QUALITY OF SERVICE SURVEY RESULTS (4G) – RAWLAKOT

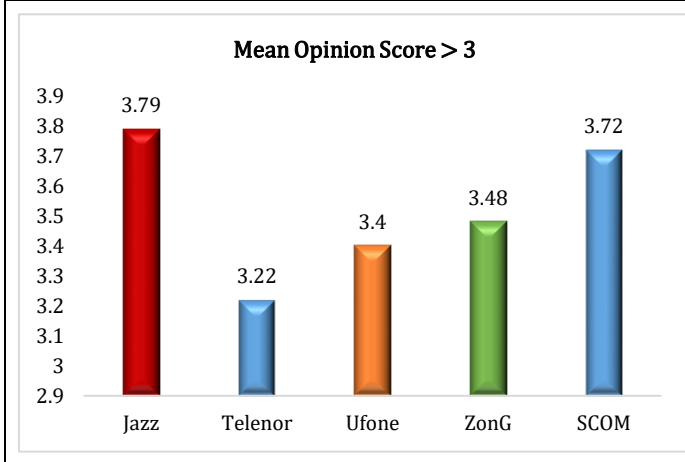
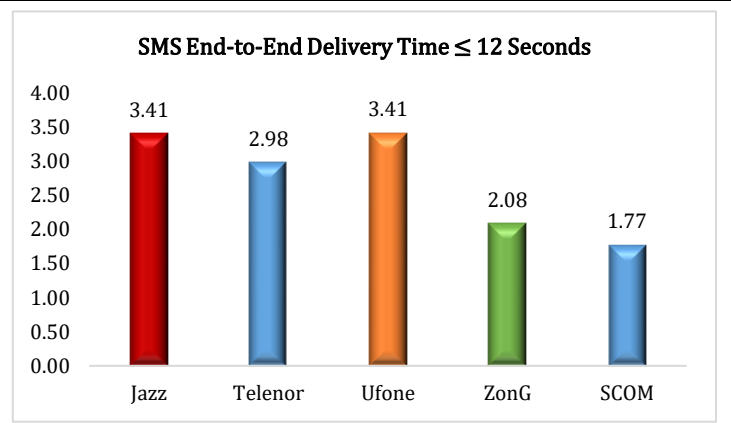
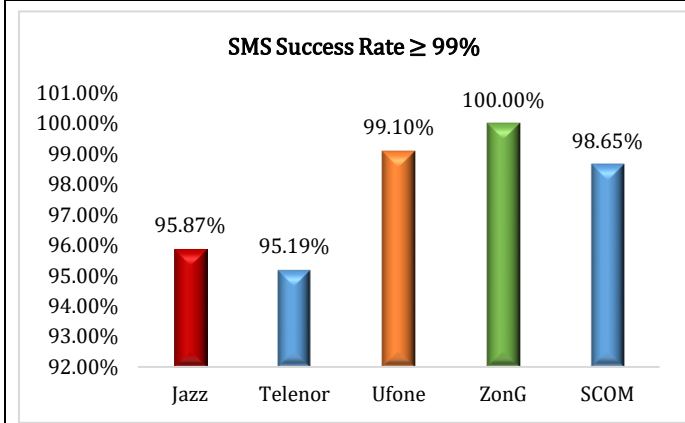
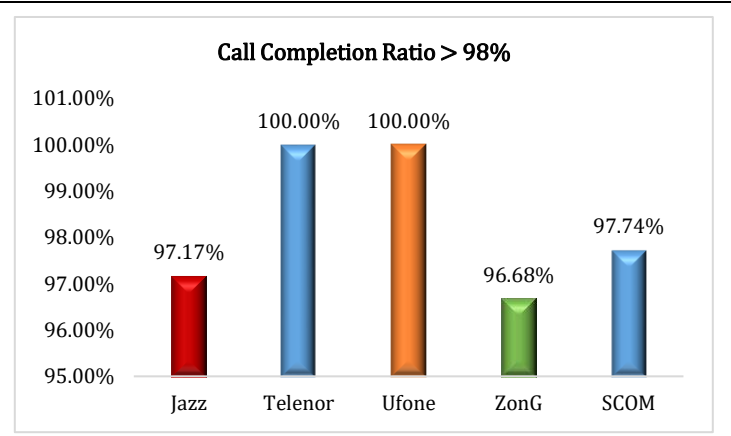
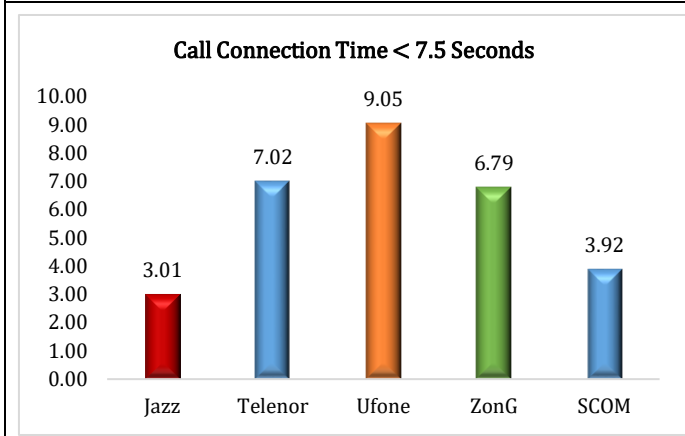
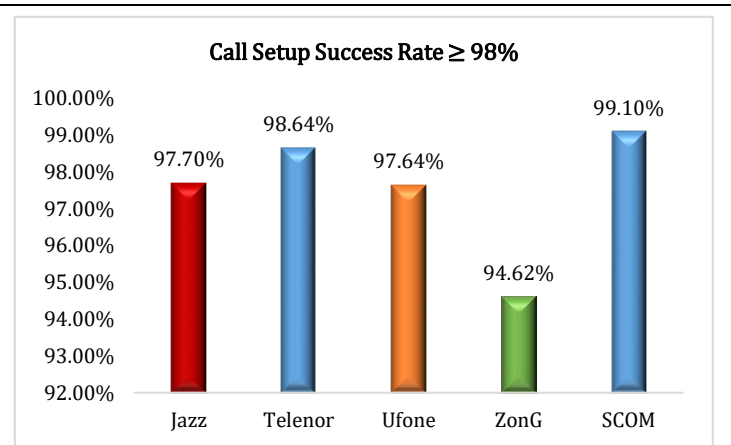
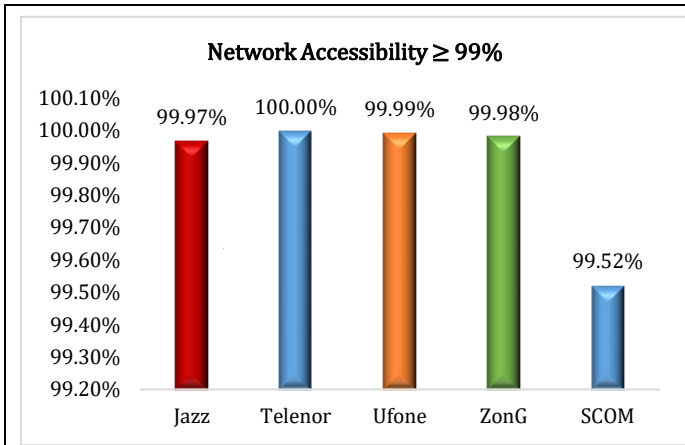


VOICE

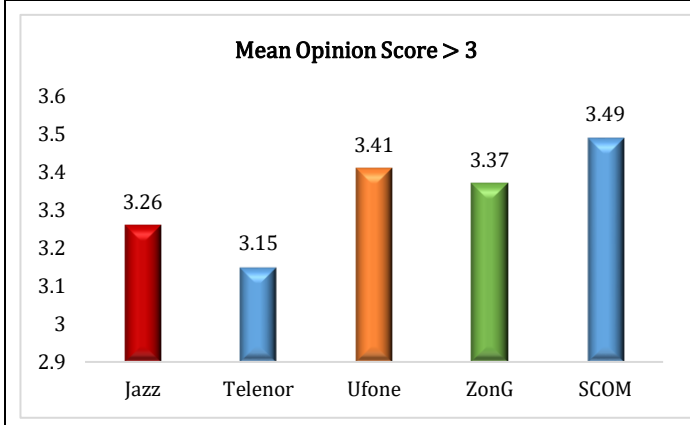
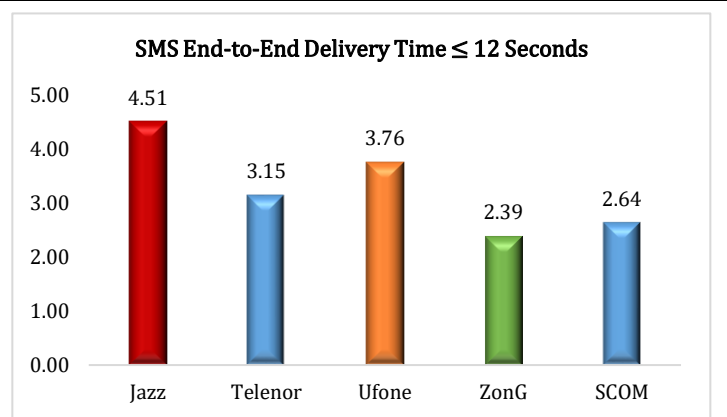
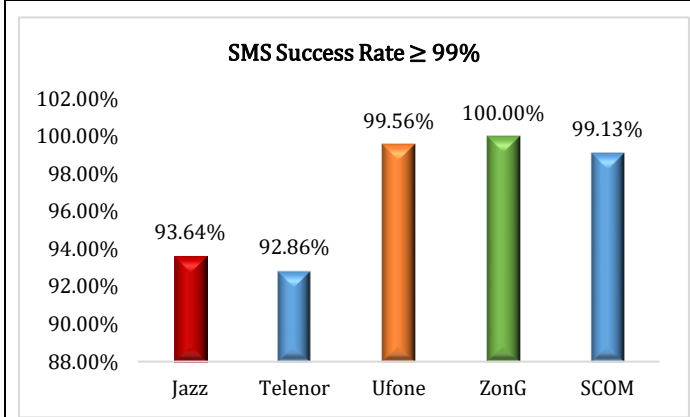
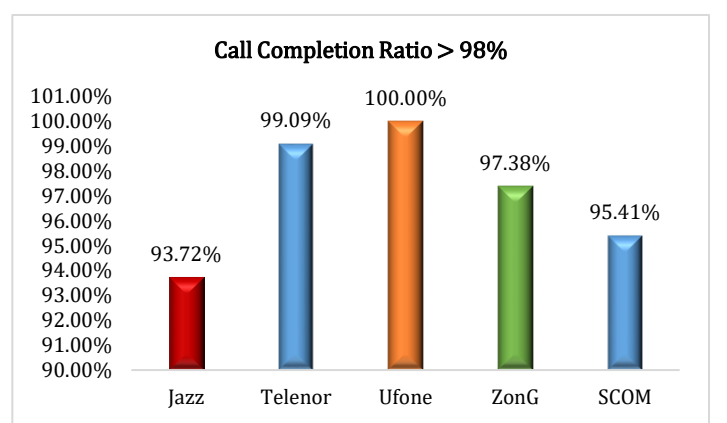
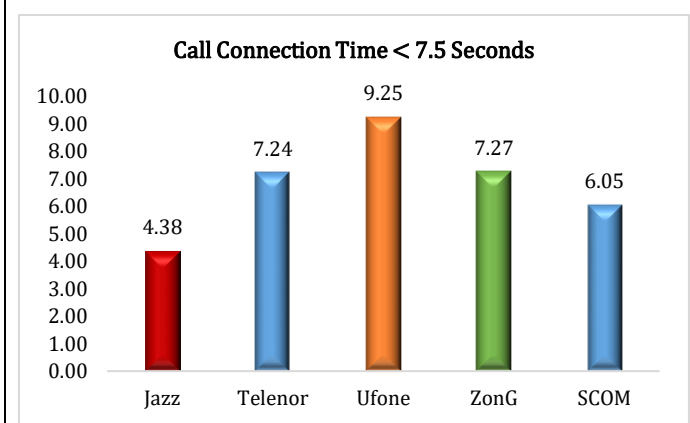
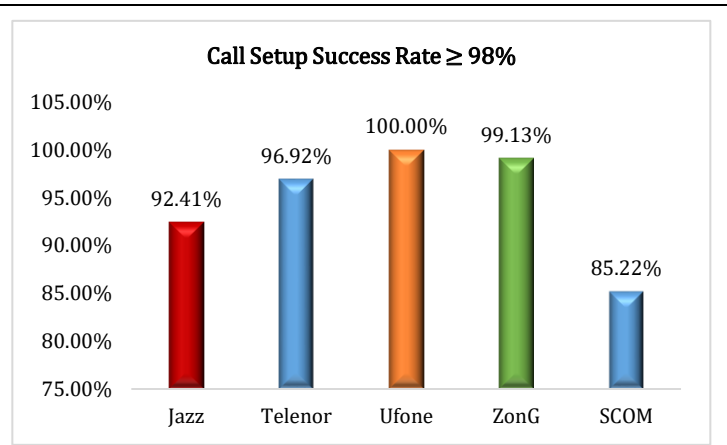
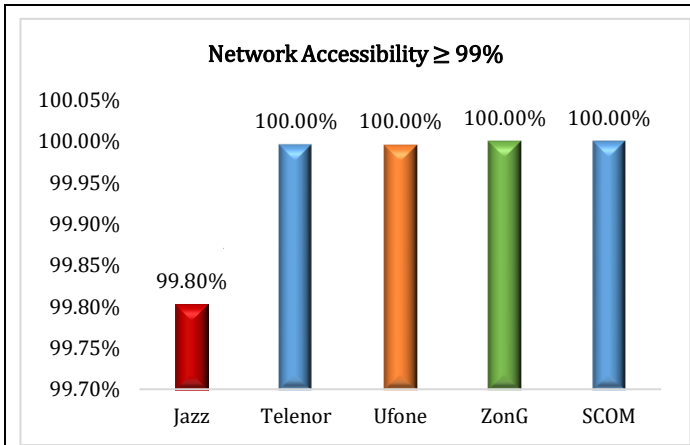
QUALITY OF SERVICE SURVEY RESULTS – MUZAFFARABAD



QUALITY OF SERVICE SURVEY RESULTS – MIRPUR



QUALITY OF SERVICE SURVEY RESULTS – KOTLI



QUALITY OF SERVICE SURVEY RESULTS – RAWLAKOT

