



## TELECOMMUNICATIONS QUALITY OF SERVICE (QoS) REGULATIONS

2024

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## **Part I. Introduction**

### **1.0 Preamble**

These Regulations have been developed by the Liberia Telecommunications Authority (LTA) pursuant to Part III Section 11. 1(q) and Part X Section 58 of the Telecommunications Act of 2007.

### **2.0 Purpose and Scope**

These Regulations have been developed to establish criteria for the improvement of telecommunications service quality and protect consumers by imposing measurable obligations on the providers of public telecommunications services to meet specific quality of service standards. These Regulations create a framework for periodically obtaining appropriate information on the level of QoS to identify problem areas, publish information on QoS performance so that consumers are better informed, and take appropriate measures to constructively engage Telecommunications Service Providers to encourage and foster improved service quality. These Regulations shall apply to all licensed Telecommunications Service Providers.

### **3.0 Objectives**

The objectives of these Regulations are as follow:

- A.** To ensure the protection and promotion of the interests of consumers against unfair practices including matters relating to the availability and quality of telecommunications services, equipment, facilities, tariffs and charges;
- B.** To improve service quality by identifying service deficiencies and by encouraging, enforcing, effecting, and/or requiring appropriate changes and solutions;
- C.** To maintain service quality while recognizing environmental and operating conditions;
- D.** To make available information that will help consumers make an informed choice of services and service providers;
- E.** To improve the operation and performance of interconnected networks;
- F.** To assist in the development of related telecommunications markets; and

- G. To measure the quality of service from time to time in line with the service parameters annexed to these Regulations in order to assess the level of performance.

#### 4.0 Terms and Definitions

As used in these Regulations, the defined terms shall have the following meanings and shall refer to both the singular and plural:

**Access:** means the making available of telecommunications facilities and equipment, services or both facilities and services by a Telecommunication Service Provider to another Service Provider or an Access Seeker, for the purpose of connecting to said Service Provider's network, including access to network elements and associated facilities, access to physical infrastructure including buildings, ducts and masts, and access to network software systems including operational support systems.

**Access Seeker:** a person requesting access.

**Act:** means The Liberia Telecommunications Act of 2007.

**Answer-seizure ratio (ASR)** refers to the measurement of network quality and call success rates in telecommunications. It is the percentage of answered telephone calls with respect to the total call volume.

**Average or Mean:** means the result of dividing the sum of the numerical values in a set by the number of values in the set.

**Busy Time:** means the hours, days, weeks or months of a Reporting Period during which the highest average traffic for a service is measured.

**Busy Hour (BH):** means the continuous 60 minutes time span of the day during which the highest usage occurs.

**Broadband Internet Access Service:** means high-speed Internet access that is always on and faster than the traditional dial-up access. Broadband includes several high-speed transmission technologies such as: Digital Subscriber Line (DSL) Cable Modem.

**BSC:** means Base Station Controller.

**Call Attempt:** means an attempt to achieve a connection to one or more devices attached to a telecommunication network.

**Commercial Launch Date:** means the date when a Service Provider commences commercial provision of a service.

**Communication:** means the transfer of information according to agreed conventions. The information flow need not be bidirectional.

**Consumer:** means any Person who uses a telecommunications service.

**Contravention:** means any failure to comply with the requirements identified in these Regulations.

**Customer Premises Equipment (CPE):** means Telecommunications equipment installed at the customer's location on the customer side of the network interface. ([ITU-T G.998.1])

**Customer:** except as otherwise indicated, means any subscriber or consumer of telecommunications services, whether an individual, corporation, governmental body or other public or private legal entity and regardless of whether the services are acquired for the customer's own use.

**Customers Service Center:** means a facility that is equipped to provide support for customers.

**End User:** means a Consumer

**Telecommunications Facility:** means any facility, apparatus or other thing that is used or is capable of being used for telecommunications or for any operation directly connected with telecommunications.

**Fixed Telephony Service (Fixed line Telephony Service):** means a telephony service that is delivered via a metal wire or optical fiber cable network.

**Fixed Wireless Telephony Service:** means a telephony service that is delivered via a terrestrial microwave link rather than metal or optical fiber network.

**Home Location Register (HLR):** means the database in which all mobile network subscriber information is stored.

**Interconnecting Service Provider:** means a Service Provider that has an Interconnection with another Service Provider at a Network Termination Point.

**Internet Access Service:** means a service that enables users to access content, information, electronic mail, or other services offered over the Internet, and may also include access to proprietary content, information, and other services as part of a package of services offered to users. "Internet access service".

**Information:** means signs, signals, writings, sounds and other data.

**Interconnection:** means the physical and logical linking of telecommunications networks used by the same or a different service provider in order to allow the users of one service provider to communicate with the users of the same or another service

provider, or to access the facilities of another service provider and “interconnection” includes “access” and for the avoidance of doubt, interconnection includes call origination, call termination and transit services.

**Key Performance Indicator (KPI):** means a measurable value that demonstrates how effectively a Service Provider is achieving QoS objectives.

**Measurement:** means the collection of quantitative data made by comparing a quantity with a standard unit.

**Network:** means a system of interconnected facilities designed to carry traffic including any Telecommunications Service.

**Network Performance:** means the ability of a network or a network portion to provide the functions related to communication between users (ITU-T Rec. E.800)

**Non-discrimination:** means supplying the same product/service to different consumers on the same financial, technical and service terms.

**Person:** means a natural or other legally recognized person or entity, and includes a joint stock company, a limited liability company, a partnership, a sole proprietorship, a joint venture, or other form of entity whether incorporated or unincorporated.

**Mobile Switching Center (MSC):** means telephone exchange that makes the connection between mobile users within the network, from mobile users to the public switched telephone network and from mobile users to other mobile networks.

**Obstruction:** Means an act to deny, prevent, or restrict LTA’s access to a Telecommunication Service Provider’s facilities, network, data, information, etc. with the intent to impede QoS investigation or audit.

**Private Telecommunications Services:** means a Restricted Telecommunications Service provided to some Defined User Group or Groups.

**Service Provider:** any Person that provides telecommunication services to the public.

**Point of Sales (POS):** means a customer service center set up to provide customer related services such as sales of SIM Cards, registration of SIM Cards, retrieval of lost SIM Cars, and to address technical issues associated with telecommunications and digital financial services.

**Public Telecommunications Network:** means fully interconnected and integrated telecommunications systems consisting of various means of transmission and switching, used to provide Basic Telephone Service and other Public Telecommunications services.

**Quality of Service (QoS):** means the collective effect of service performance which determines the degree of satisfaction of a user of the service (ITU-T Rec. E.800); and the statement of the level of quality required by the applications of consumers/users of a service, which may be expressed non-technically (ITU-T Rec. G.1000). It also refers to the capability of a network to offer a service with a certain quality. The quality of a service can be related to a number of different parameters such as:

- Availability of a link;
- Number of bit errors;
- Latency (delay in the network);
- Jitter.

**Service Provider with Significant Market Power (SMP):** means a Service Provider with a position of economic strength, acting either individually or jointly with others, permitting a service provider to act to an appreciable extent independently of customers or competitors, or otherwise constituting a position of dominance in one or more identified telecommunications service markets.

**Subscriber:** means Customer.

**Telecommunications Services:** means any provision of the voice and data transmission; SIM cards and Pre-paid accessories; equipment and facilities to customers; or any form of transmission of signs, signals, text, images or other intelligence by means of a telecommunications network, but does not include a broadcasting service; means the provision of services inclusive of the transmission/reception and routing of information in a potentially interactive manner by any technological means.

## **Part II. Quality of Service Principles, Measurement, Monitoring, Reporting, Record Keeping, and Consumer Complaint Resolution**

### **5.0 Principles**

**5.1** The Quality of Service parameters defined in these Regulations are harmonized with the following principles:

- A.** Measurements should be required for only features or services that are significant and specified in these Regulations;
- B.** Measurements and other reporting methods should facilitate LTA and consumers' comparison of service quality level provided by Telecommunications Service Providers, and should not restrict other quality of service measurement monitoring practices in the telecommunications sector of Liberia;
- C.** The published measurements of Quality of Service should reflect direct user's experience and/or perception; and



- D.** Enable the LTA to establish appropriate targets to maintain the level of service quality needed in the Liberian telecommunications sector and measure specific parameters such as those listed in the schedules of parameters annexed to these Regulations.

## **6.0 Measurement and Monitoring**

**6.1** All licensed Service Providers shall measure across their networks all quality of service parameters stipulated in these Regulations. The LTA shall have the discretionary right to request the measurements of selected parameters for specified geographical areas.

**6.2** Measurements shall be done in accordance with the measurement methods defined in the Schedules annexed to these Regulations and any other methods that may be determined by the LTA from time to time.

**6.3** The LTA shall, in Monitoring compliance, use any of the following methods singly or in combination:

- a.** Drive Test
- b.** Consumer Survey
- c.** Review and analysis of raw and processed data from operation support systems (OSS) and other relevant sources.
- d.** And other acceptable monitoring method.

**6.4** KPI measurements and monitoring may be carried out at all network segments including BTS, Cell, BSC, MSC, etc.

## **7.0 Reporting**

**7.1** Telecommunications Service Providers are required to submit to the LTA, in accordance with the Reporting Period, Quality of Service Reports detailing measurements done pursuant to Section **6.1** of these Regulations.

**7.2** The Reporting Period, which is the period of time over which measurements shall be taken, shall be three (3) months commencing from the month these Regulations shall become effective, or as may be decided from time to time by the LTA.

**7.3** The Quality-of-Service Reports shall be submitted to the LTA seven (7) days following the end of the Reporting Period.

## **8.0 Reporting Areas**

**8.1** Pursuant to Section **7.0**, the Reporting Area is the geographic area such as county, district, city, etc. for which measurements shall be taken and recorded. The LTA may request report from a specific geographic area where Service Providers' networks are available.

## **9.0 Retention of Records**

**9.1** Telecommunications Service Providers, as a matter of necessity, shall retain all quality-of-service data, including all measurements and related records for a minimum of twelve (12) months following the end of the Reporting Period or as may be directed by the LTA.

## **10.0 Establishment of Point of Sales**

**10.1** All Service Providers shall establish a point of sales (POS) in all 15 county capital cities and all major towns and cities with population of 6,000 and above based on the Liberia Institute of Geo-information Services (LISGIS) 2022 National Population and Housing Census report.

**10.2** The timeframe allowed for Service Providers to establish POS pursuant to Section **10.0** of these regulations above shall be one (1) year immediately following the effective date of these regulations.

**10.3** Any Service Provider failing to adhere to the establishment of POS as stipulated in Section **10.1** within the timeframe stipulated in Section **10.2** shall be subjected to the penalty stipulated in **Table 8 of Schedule VIII** of these regulations.

## **11.0 Consumer Complaint Resolution**

**11.1** All Service Providers shall ensure the resolution of any consumer's complaint within the resolution-time stated in these Regulations or as may be approved by the LTA from time to time.

**11.2** Where a Telecommunications Service Provider fails to resolve a consumer's complaint in accordance with Section **11.1** of these Regulations, said Telecommunications Service

Provider shall compensate the consumer, and in addition, shall pay the fines stipulated in row **6 of Table 7 Schedule 8 annexed** to these regulations.

**11.3** In the event where a subscriber pays for a service, such as the “three-day promotional” package, or any other packages, and said subscriber is unable to utilize the package as a result of a Service Provider’s network outage for days or weeks, the Service Providers shall restore the full amount that was available before the network outage.

**11.4** Service Providers failing to comply with Section **11.3** of these regulations shall be subjected to the penalty stipulated in **Table 8 of Schedule VIII** of these regulations.

### **Part III. Publication**

#### **12.0 Publication**

**12.1** The Quality-of-Service Reports shall be published by the LTA on its website and/or through any other appropriate and acceptable medium of communication with the contents and formats prescribed in Section **13.0** of these Regulations, or as may otherwise be determined by the LTA.

#### **13.0 Timing of Publication**

**13.1** The LTA may, after analyzing data and reports submitted by Telecommunication Service Providers, mandate or request them to make necessary changes or corrections to the measurements and thereafter, the report shall be published by the LTA.

#### **14.0 Content and Format of Publication**

**14.1** Reports submitted by Telecommunications Service Providers to the LTA shall include the following:

- A.** The type of services offered by the Telecommunications Service Provider;
- B.** An identification of the Reporting Area or network segments for which the Measurements were taken;
- C.** The Published Measurements submitted by the Telecommunications Service Providers;
- D.** An indication of any Target for the Parameter of services that have not been reached by the Telecommunications Service Provider;

- E. Any explanatory remarks by the Telecommunications Service Provider, accepted by the LTA, including but not limited to remarks about changes in environmental or operating conditions that could not have been reasonably foreseen by the Telecommunications Service Provider; and
- F. Any other information or comparison of service quality that the LTA deems necessary to help the LTA or consumers to assess the performances of competing Telecommunications Service Providers.

### **15.0 Approving Explanatory Remarks**

**15.1** Explanatory remarks by a Telecommunications Service Provider under Section **14.1(E)** may be approved by the LTA taking into account factors including but not limited to:

- A. Service deficiencies that arise partly or wholly from the services of another Licensed Operator, or another Operator licensed to provide services in other countries that may contribute to the Reportable Service as per the annexed Schedules;
- B. Changes in environmental or operating conditions that could not have been reasonably foreseen by the Licensed Operator; and
- C. Expectations about Quality of Service that are appropriate to the billing for the services of the Licensed Operator.
- D. Service deficiencies or interruption due to network and site maintenance.
- E. Service deficiencies arising from external causes: power outages, fiber interruption, road work and extreme weather conditions.

## **Part IV: Audit and Investigation**

### **16.0 Auditing of Quality of Service**

**16.1** The importance of auditing of quality of service is to verify QoS experienced by consumers and compare the results therefrom against the Telecommunications Service

Provider's obligations. The LTA may audit some or all of the Quality of Service data obtained from Telecommunications Service Providers pursuant to Section 6.1 of these Regulations or data retained by Telecommunications Service Providers.

**16.2** In conducting audits, the LTA may vary the frequency of the audits, data collection exercises, the services provided by the Telecommunications Service Provider, parameters, Reporting Areas, network segments, and Reporting Periods requiring audits.

**16.3** Any data with relevance to QoS audit, other than the ones mentioned in these Regulations, may also be used by the LTA in its auditing and investigation exercises.

## **17.0 Investigation of Measurement, Reporting and Record Keeping Procedure**

**17.1** The LTA shall investigate the Quality-of-Service measurement, reporting and record keeping procedures of a Telecommunications Service Provider pursuant to these Regulations and consistent with **Part X Section 54 of the ACT**.

### **Part V: Contravention and enforcement**

#### **18.0 Contravention**

**18.1** For each parameter that is reportable for a service, Reporting Area, prescribed Network segment, and a Reporting Period, a Telecommunications Service Provider providing the service shall be considered to have committed a breach of these Regulations if:

- A.** The Telecommunications Service Provider fails to perform the measurement, reporting, and record-keeping tasks set out in these Regulations;
- B.** The Service Provider fails to reach a Target for the Parameter and the Service
  - i. After the publication of these Regulations;
  - ii. The date when the Target was most recently specified; or
  - iii. The date when the Target was most recently changed to require a higher standard of quality than was previously indicated.

- C. The Telecommunications Service Provider fails to submit, during a time period specified by the LTA, information requested by the LTA pursuant to **Sections 6, 9, and 15.3** of these Regulations.
- D. The Telecommunications Service Provider submits or publishes false or misleading information about Quality of Service; or
- E. The Telecommunications Service Provider obstructs or prevents an investigation by the LTA of the Quality of Service measurement, reporting, and record-keeping.

## **19.0 Enforcement Measures**

**19.1** If a Service Provider contravenes these regulations, the LTA shall take one or more of the following enforcement measures pursuant to **Section 60 of the 2007 Telecommunications ACT**:

- A. Requires the Telecommunications Service Provider to publish additional Quality of Service information about the quality of services being provided;
- B. Issues further directives respective of these regulations including, but not limited to, directing Service Providers to compensate consumers for poor quality of service; or
- C. Requires the Telecommunications Service Providers to pay the appropriate fine stipulated in **Schedule VIII** annexed to these Regulations.

## **Part VI: Amendment, Citation and Entry into Force**

### **20.0 Amendment**

**20.1** The LTA may review or amend these Regulations, including the Schedules pursuant to **Section 58 (2)** of the Act from time to time.

**20.2** In conducting a review or amendment of these Regulations, the LTA may request and receive advice or comments from external advisory groups or consultants. However, the advice or comments shall not be binding on the LTA.

**20.3** The LTA may issue additional Rules, Orders, or Notices on any aspect of these Regulations. Such rules, Orders or Notices shall be of general application or specific to a Telecommunications Service Provider from time to time.

### **21.0 Citation and Entry into Force**

**21.1** These Regulations may be cited as the “**LTA Quality of Service (QoS) Regulations**”, 2023 and shall come into effect on the day it is published.

## Schedules

### SCHEDULE I

#### QUALITY OF SERVICE (QoS) PARAMETERS FOR INTERCONNECTION

Every Telecommunications Service Provider required per its license to interconnect with other communications networks shall meet the following quality of service benchmarks for any interconnected service in respect of each specified parameter measured by real traffic on any interconnected route.

The Service Provider shall submit a monthly report based on peak hour conditions.

Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
Interconnection Route Utilization (%)	The percentage of Provisioned interconnection Route that is carrying traffic.	$(\text{Capacity in use} / \text{Capacity Provisioned}) * 100$	Real Traffic	Performance Management system	Not more than 80% of capacity
Time To Repair (TTR) Interconnection Route.	The duration of a reported interconnection fault to service restoration.	Time of Total Service Restoration - Time of Occurrence of Fault	Real Traffic	Performance Management system	Not more than two Hours
Network Effectiveness Ratio (NER)	The ability of the network to deliver calls to far-end terminals (Reference: ITU-T E.425 Rec.)	$(\text{Seizure delivered to far-end Connecting Entity}) / (\text{Total Seizure requests from Connecting Entity}) * 100$	Real Traffic	Performance Management system	Not less than 95%

**SCHEDULE II**  
**QUALITY OF SERVICE (QoS) PARAMETERS FOR MOBILE VOICE SERVICE**

A Service Provider required per its license to provide mobile voice services shall meet the following Quality of Service benchmarks in respect of each specified parameter measured by test traffic in any locality or Performance Management System based on daily or peak hour conditions; where appropriate.

Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
Service Coverage	The transmitter output power as received by a reference antenna at a distance from the transmitting antenna	Field Strength measurements	Field Strength measurements	Test Stations or Drive Test System	>-75dBm for outdoor >-85dBm for in-vehicles >-95dBm for indoor city
Call Connection Success Rate (%)	The percentage of attempted calls that are connected to the intended recipients	$(\text{Number of Calls connected to intended recipients} / \text{Number of Calls attempted}) * 100$	Real Traffic from OSS and/or Test Traffic	Performance Monitoring System/ Test Stations or Drive Test System	> 95% <i>(90% of cells should record measurement values &gt; 95% for real traffic)</i>
Call Drop Rate (%)	The percentage of calls connected to intended recipients that ended or released without the intervention of any of the users	$(\text{Number of Calls disconnected without intervention by any user} / \text{Number of Calls connected to intended recipients}) * 100$	Real Traffic from OSS and/or Test Traffic	Performance Monitoring System/ Test Stations or Drive Test System	<3% <i>(90 % of cells should record measurement values &lt; 1% for real traffic)</i>



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Call Setup Time	The duration from when a call is made to the time of receiving a ring back tone	Time Call Alerting-Time Dial	Test Traffic	Test Stations or Drive Test System	<10seconds at 95 <sup>th</sup> percentile of all cases
Voice Quality	Numerical indication Of the perceived quality of received media after compression and /or transmission	Mean Opinion Score (MOS) ( Reference- ITU-T P.863)	Test Traffic	Test Stations or Drive Test System	3.5 for 2G and 3G, 3.8 for 4G for 95% of all Cases

## SCHEDULE III

## QUALITY OF SERVICE (QoS) PARAMETERS FOR MOBILE MESSAGING SERVICE

A Service Provider required per its license to offer mobile messaging service shall meet the following Quality of Service benchmarks for any messaging service in respect of each specified parameter measured by test traffic.

Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
Delivery Success Rate (%)	The percentage Of sent messages that Are received By the intended recipients	(Number of SMS received By intended recipients/ Number of SMS sent) *100	Test Traffic	Test Stations or Drive Test System	≥ 98%
Delivery Success Time	The duration from when an SMS is sent to The time of Receiving the SMS by the intended recipient	Time SMS received- Time SMS sent	Test Traffic	Test Stations or Drive Test System	All SMS less than 10 seconds  <b>Note:</b> The total the tower can carried. Should measure also

## SCHEDULE IV

### QUALITY OF SERVICE (QoS) PARAMETERS FOR FIXED WIRE AND WIRELESS SERVICES

A Service Provider of basic telephony service shall meet the following Quality of Service benchmarks in respect of each specified parameter measured in any locality.

The Service Provider shall submit a quarterly report based on daily and/or peak hour conditions.

Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
Service Provision Time for wire services	The duration for a service to be operational after payment for the service has been made	Time Service Operational- Time Payment of Service	Complaints	Trouble ticket system	≤ 14 calendar days for wire services
Service Provision Time wireless services	The duration for a service to be operational after payment for the service has been made	Time Service Operational- Time Payment of Service	Complaints	Trouble ticket system	< 5 Calendar Days
Time to Repair (TTR)	The duration from a reported fault to service restoration	Time Service Restored- Time Reported	Complaints	Trouble ticket system	≤ 48 hours
Call Connection Success Rate (%)	Percentage Of successfully Connected calls	(Number of successfully connected call attempts) / (Total number of attempts) x100	Real Traffic from OSS or Test traffic	Performance Monitoring system or Test Stations	> 99%

SCHEDULE V  
QUALITY OF SERVICE (QoS) PARAMETERS FOR DATA SERVICE

A Service Provider that provides data services shall meet the following Quality of Service benchmarks in respect of each specified parameter measured in any locality.

**HTTP (Web Browsing) Service**

Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
HTTP set-up time	The time it takes for a standard web page to start Loading. The time period needed to access the service successfully (Ref: ITU-T E.804)	Time Content Received-Time Content requested	Real Traffic from OSS and or Test traffic	Performance Monitoring System/ Test Stations or Drive Test System	< Five (5) seconds at 95 <sup>th</sup> percentile
HTTP Drop Rate (%)	The percentage of incomplete data transfers that were started successfully	(Number of incomplete data transfers/ Number of transfers started successfully) *100	Real Traffic from OSS and or Test traffic	Performance Monitoring System/ Test Stations or Drive Test System	< 1%
HTTP Mean Bit Rate	The average data transfer rate measured throughout the entire session of the service	Average HTTP Throughput	Real Traffic from OSS and or Test traffic	Performance Monitoring System/ Test Stations or Drive Test System	≥ 1Mb/s
Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
Latency	The time it takes for a data packet to be transmitted and returned To the source. The total time for round trip	Average round trip time	Test Traffic (ping test)	Test Stations or Drive Test System	≤85ms (for Broadband wireless service) < 100ms (another mobile cellular service)

Parameter	Definition	Formula	Measurement Mechanisms	Measurements Tools	Targets
Billing Accuracy-Messaging		Message Length of 160 characters	Real or Test Traffic	Billing Assurance Systems	Accurate billing
Billing Accuracy-Internet Services		Per Volume billing	Real or Test Traffic	Billing Assurance Systems	Accurate billing
Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target
Provision and installation of Internet equipment (modem and related accessories) on premise after Payment	Number of days from Service request to Service operations	Time of Service provision – Time of Service request	Complaints	Trouble ticket system	≤ Five (5) Days
Interactive Voice Response (IVR)	Duration of Announcement of the entire IVR options before a customer can make A choice.	Time IVR Option to Operator to speak to an agent - Time IVR started	Test traffic	Test Stations	< Fifteen (15) Seconds
Call Centre Operator Response	Duration of waiting after the option to a Customer Care Assistant has been Chosen	Time Operator Assistance Pick up- Time Making Operator request	Test traffic	Test Stations	< Thirty (30) Seconds
Customer satisfaction on overall quality of service		Number of answers as good Quality Number of customer interviewed	Complaints	Trouble ticket system or Survey	>95%
Customer Service Point Delay	The duration for queuing at a Customer Service Point before queries or complaints can be rendered	Time Customer Service Assistance Time of issued queue number	Complaints	Trouble ticket system	<15 minutes

Complaint Resolution Time	The duration from a reported fault to service restoration	Time Service Restored- TimeReported	Complaints	Trouble ticket system	≤ 5 days
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FTP  
(FILE)

## TRANSFER PROTOCOL) Service

Parameter	Definition	Formula	Measurement Mechanism	Measurement Tool	Target Preferred
FTP {download   upload} set-up time [s]	The duration to access the service successfully; starting from service request to the point of time when the content starts download /upload	Time Service Access Successful Time Service Access Start	Real Traffic from OSS and or Test traffic	Performance Monitoring System/ Test Stations or Drive Test System	< Five (5) seconds at 95 <sup>th</sup> percentile
FTP Drop Rate	The percentage of incomplete data transfers that were started successfully	(Number of incomplete data transfers/ Number of transfers started successfully) *100%	Real Traffic from OSS and or Test traffic	Performance Monitoring System/ Test Stations or Drive Test System	<1%
FTP {download   upload} mean data rate [Mb/s]	The average data transfer rate measured throughout the entire session of the service	Average FTP Throughput	Test traffic	Test Stations or Drive Test System	≥ 10 Mb/s (for Broadband Wireless services) <2 Mb/s (other mobile cellular Services)

**SCHEDULE VI  
BILLING, CUSTOMER SERVICE & SATISFACTION MEASURES**

A Service Provider required per its license to offer any mobile service shall meet the following benchmarks for billing, customer service and customer satisfaction in respect of

Billing Accuracy-Voice Calls	Same duration in seconds used for a call should be used for billing	Per second billing	Real or Test Traffic	Billing Assurance Systems	Accurate billing
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**SCHEDULE VII  
CUSTOMER SATISFACTION ATTRIBUTES**

A Service Provider in respect of the following Quality of Service benchmarks shall be subject to periodic assessment by the Authority through customer satisfaction surveys, which may be conducted by the Authority either through its own officers or employees or through any agency appointed by Authority.

<b>Parameter Name</b>	<b>Target</b>
% of customers satisfied with the service availability.	>90%
% of customers satisfied with the service accessibility.	>90%
% of customers satisfied with the reliability.	>90%
% of customers satisfied with billing performance.	>90%
% of customers satisfied with the help/ inquiry services.	>90%

**SCHEDULE VIII**  
**SANCTIONS ON DEFAULT ON QUALITY-OF-SERVICE OBLIGATIONS**

**Table 1: Sanctions for Interconnection**

<b>Parameter</b>	<b>Definition</b>	<b>Measurement Tool</b>	<b>Target</b>	<b>Sanction</b>	<b>Penalty Points</b>
Interconnection Route Utilization	The percentage of provisioned interconnection route that is carrying traffic	Performance Management System	Not more than 70% of capacity	Directives to Expand capacity; fines to Authority from Route Owner	\$ 1,000 per route for more than 70%
Time To Repair (TTR) Interconnection Route	The duration from a reported interconnection fault to service restoration	Performance Management System	Not more than One Hour	Compensation to Partner; fines to Authority	\$ 1,000 per hour to be paid by defaulting operator
Network Effectiveness Ratio	According to ITU-T E.425 Rec.)	Performance Management System	Not less than 95%	Fines to the Authority	\$ 1,000 per route

**Table 2: Sanctions for Mobile Voice Service**

Parameter	Definition	Measurement Tool	Target	Sanction	Penalty Points
Service Coverage	The transmitter power output as received by a reference antenna at a distance from the transmitting antenna	Test Stations or Drive Test System	>-75dBm for indoors >-85dBm for in-vehicles >-95dBm for outdoor in city	Fine to be paid by defaulting operator to Authority	\$ 3,000 per City / County
Call Connection Success Rate	The percentage of attempted calls that are connected to the intended recipients	Performance Monitoring System/ Test Stations or Drive Test System	> 95%	Fine to be paid by defaulting operator to Authority	\$ 3,000 per City / County
Call Drop Rate	The percentage of calls connected to intended recipients that ended or released without the intervention of any of the users	Performance Monitoring System/ Test Stations or Drive Test System	<1%	Fine to be paid by defaulting operator to Authority	\$ 3,000 per City / County
Call Setup Time	The duration from when a call is made to the time of receiving a ring back tone	Test Stations or Drive Test System	<10seconds at 95 <sup>th</sup> percentile of all cases	Fine to be paid by defaulting operator to Authority	\$ 3,000 per City / County
Voice Quality	According to ITU-T P.863	Test Stations or Drive Test System	> 3.5 for 95% of all cases	Fine to be paid by defaulting operator to Authority	\$ 3,000 USD per City / County



**Table 3: Sanctions for Mobile Messaging Service**

Parameter	Definition	Measurement Tool	Target	Sanction	Penalty Points
Delivery Success Rate	The percentage Of sent messages That are received By the intended recipients	Test Stations or Drive Test System	≥ 98%	Compensation To Customers; Fines to be paid To the Authority	Twice the Amount charged For undelivered service; \$ 1,000 USD for every default
Delivery Success Rate	The duration from when an SMS is sent to the Time of receiving The SMS by the Intended recipient	Test Stations or Drive Test System Delivery Success Time	All SMS less than 5 seconds	Fine to be paid By defaulting Operator	\$ 1,000 USD for Every destination In default

**Table 4: Sanctions for FIXED WIRE AND WIRELESS SERVICES**

Parameter	Definition	Measurement Tool	Target	Sanction	Penalty Points
Service Provision Time for wire services	The duration for a service to be operational after payment for the service has been made	Trouble ticket system	< 5 Calendar Days	Compensation to Customer	Twice the amount paid for the Service
Service Provision Time for wireless services	The duration for a service to be operational after payment for the service has been made	Trouble ticket system	< 5 Calendar Days	Compensation to Customer	Twice the amount paid for the Service
Time to Repair (TTR)	The duration from a reported fault to service restoration	Trouble ticket system	≤ 48 hours	Compensation to Customer	\$20.00 USD per day or pro-rat after every hour

Call Connection Success Rate	Percentage of successfully connected calls	Performance Monitoring system or Test Stations	> 99%	Fine to be paid by defaulting Operator	\$1,000 US for every destination in default
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**Table 5: FTP (FILE TRANSFER PROTOCOL) Service**

Parameter	Definition	Measurement Tool	Target	Sanction	Penalty Points
FTP {download  upload} set-up time [s]	The duration to access the service successfully; starting from service request to the point of time when the content starts download /upload	Performance Monitoring System/ Test Stations or Drive Test System	< Five (5) seconds at 95 <sup>th</sup> percentile	Fine to be paid by defaulting Operator	\$ 1,000 USD per City/County district
FTP Drop Rate	The percentage of incomplete data transfers that were started successfully	Performance Monitoring System/ Test Stations or Drive Test System	<1%	Fine to be paid by defaulting Operator	\$ 1,000 USD City/County district
FTP {download  upload} mean data rate [Mb/s]	The average data transfer rate measured throughout the entire session of the service	Test Stations or Drive Test System	≥ 10 Mb/s (for Broadband Wireless services) <2 Mb/s (other mobile cellular Services)	Compensation to Customers; Fines to be paid to the Authority	\$30.00 USD per day to customers; or a fine of \$ 1,000 USD per locality or district

**Table 6: Sanctions for Infrastructure**

Parameter	Definition	Measurement Tool	Target	Sanction	Penalty Points
Coverage Signal Strength	The transmitter power Output as received by A reference antenna At a distance from the transmitting antenna	Test Stations or Drive Test System	>-75dBm for Indoors >-85dBm for In-vehicles >-95dBm for outdoor in city	Fine to be paid By defaulting Operator	\$ 1,000 USD per locality or District
Time To Restore Service (TTR)	The duration from a Reported outage to service restoration	Performance Management system	Less than 6 hours for a Cell; Less than 1 hour for core network	Fine to be paid By defaulting Operator	\$ 1,000 USD per hour After 6 hours for a Cell; \$ 2,500 USD per Hour for core network

**Table 7: Sanctions for Billing, Customer Service and Satisfaction Measures**

Parameter	Definition	Measurement Tool	Target	Sanction	Penalty Points
Billing Accuracy	Same duration in seconds used for a call used should be used for charging	Billing Assurance Systems	Accurate charging	Compensation to customers; Fine to be paid by defaulting Operator	Twice amount overcharge; \$ 1,000 USD for every destination in default
Provision and installation of Internet equipment (modem and related accessories) on premise after payment	Number of days from Service request to Service operations	Trouble ticket system	≤ Five (5) Days	Compensation to customers	Cost of service charged per day after 5 days
Interactive Voice Response (IVR)	Duration of announcement of the entire IVR options before a customer can make a choice	Test Stations	< Fifteen (15) Seconds	Fine	\$ 1,000 USD per destination
Call Centre Operator Response	Duration of waiting after the option to a Customer Care Assistant has been chosen	Test Stations	< Thirty (30) Seconds	Fine	\$ 1,000 USD per destination
Customer Service Point Delay	The duration for queuing at a Customer Service Point before queries or complaints can be rendered	Trouble ticket system	> Fifteen (15) minutes	Compensation	\$2.00 USD per hour after 15 minutes
Complaint Resolution Time	The duration from a reported fault to service restoration	Trouble ticket system	≤ Five (5) Days	Compensation	\$ 1,000 USD per day after 5 days

**Table 8: Sanctions for Other Regulatory Breaches**

Offense	Penalty
Obstruction of QoS Audit or Investigation	\$100,000 USD
Misleading and False Information	\$50,000 USD
Delay to Report on Time	<p>Any Telecommunication Service Provider who fails to submit required QoS information/data (Report) to the LTA (without prior notice) within the time frame required for submission of QoS Report shall be assessed a delayed submission penalty as follows:</p> <ul style="list-style-type: none"> <li>a. A penalty not exceeding One Thousand United States Dollars (USD1, 000.00) shall be charged per day for each day that the delay continues.</li> <li>b. If the delinquency continues, the LTA may institute further regulatory and/or legal actions pursuant to Law.</li> </ul>
Non-Compliance with POS Establishment as per the QoS Regulations	<ul style="list-style-type: none"> <li>a. Any Service Provider failing to comply with Section 10 of these Regulations shall be fined USD \$250,000. If the non-compliance continues, the fine herein shall be double for every subsequent year that the non-compliance continues.</li> </ul>
Failure to restore full amount not utilized by subscribers as the result of network becoming unavailable	Service Provider failing to comply with Section 11.3 of these regulations, shall paid a fine of US\$100.00 per subscriber and in addition, restore the full amount lost by the subscriber.

**Note: ALL FINES CAN ALSO BE PAID IN LIBERIAN DOLLARS AT CBL PREVAILING EXCHANGE RATE.**

**DONE BY THE LIBERIA TELECOMMUNICATIONS AUTHORITY**

**IN MONROVIA, LIBERIA ON THIS \_\_\_\_ DAY OF MARCH 2024**

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Hon. Cllr. Osborne K. Diggs, Jr.  
Commissioner, LTA

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Hon. James Gbarwea  
Commissioner, LTA

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Hon. D. Zotawon Titus.  
Commissioner, LTA

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Hon. Israel Akinsanya.  
Commissioner, LTA

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Hon. Edwina Crump Zackpah  
Chairperson, LTA

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## **APPENDIX I: Reporting Template**

### **Reporting Template**

Reports submitted by Telecommunications Service Providers to the LTA shall include the following:

- A.** The type of services offered by the Telecommunications Service Provider;
- B.** An identification of the Reporting Area or network segments for which the Measurements were taken;
- C.** The Published Measurements submitted by the Telecommunications Service Providers;
- D.** An indication of any Target for the Parameter of services that have not been reached by the Telecommunications Service Provider;
- E.** Any explanatory remarks by the Telecommunications Service Provider, accepted by the LTA, including but not limited to remarks about changes in environmental or operating conditions that could not have been reasonably foreseen by the Telecommunications Service Provider; and
- F.** Any other information or comparison of service quality that the LTA deems necessary to help the LTA or consumers to assess the performances of competing Telecommunications Service Providers.