



Quality of Service (QoS) Benchmarking

REQUEST FOR EXPRESSION OF INTEREST

Role

The office of the Telecommunications Radiocommunications and Broadcasting Regulator (TRBR) was established by an Act of Parliament called the Telecommunications Radiocommunications and Broadcasting Regulation Act 2009 as amended by Amendment 22 of 2018 ("the Act") where it, among other things mandated TRBR to regulate the telecom sector.

Since its establishment in 2008, the TRBR has witnessed an increasing and tremendous growth in the telecommunications sector throughout the country. In 2012, the Government of Vanuatu launched the Universal Access Policy (UAP). In the policy was stated that by the 1st of January, 2018, 98% of the population of Vanuatu would have access to mobile telephony services. Since then, the TRBR has been working with the two main Telecom Operators to accomplish this. As all these developments take place it draws the TRBR to establish a baseline and regularly monitor the performance of service provider networks to ensure the subscribers obtain a quality service.

Vanuatu is among the developing countries in the world and is in need of in-depth expertise in carrying out this QoS benchmarking activity. This will be the first of its kind to be done in Vanuatu and therefore TRBR recommends that it will be done right across the country covering the main towns, population centres and a selection of both UAP and Commercial sites.

Expressions of interest are sought from Firms, Organization, or Consultants with expertise in conducting the QoS benchmarking exercise.

Interested and eligible consultants must provide a response to the Terms of Reference (ToR) and strong supporting information indicating that they are qualified to carry out the activity. Training and knowledge transfer in the form of on-site discussions and coaching where required and appropriately scheduled with the expert.

Objectives of QoS Benchmarking

The main objectives of QoS benchmark measurement activity are:

- I. To ensure the service provided meets the standards of internationally recognized institutions and that a benchmark is set to locate areas of improvement for service providers;
- II. To inform the public in the simplest way possible on some key indicators of QoS for Mobile Services and so in doing affected consumers can make informed choices and understand the telecommunications market better;
- III. To ensure the TRBR continues to have access to timely, relevant and accurate information regarding the QoS to enable it to appropriately perform its role, and to effectively and efficiently monitor the activities of the telecommunications sector in Vanuatu and ensure and protect sustainable and effective competition;
- IV. To assist and enable TRBR and Government of Vanuatu policies to be evidenced-based and informed by current and appropriate measureable facts and trends within the telecommunications market of Vanuatu; and
- V. To continue to maintain Vanuatu's active participation and contribution in international telecommunications and regulatory matters by providing accurate and timely information to our international ICT partners and affiliated member associations, and by meeting expected international standards.

Required Experience

The interested organization should have the following experience:

- At least 4 to 6 years of Mobile QoS Benchmarking
- Must have previously done some similar work with excellent outcome
- Must have previously done similar work for a Pacific island nation consisting of many small islands.
- Must be able to carry out measurements across the country
- Must be able to compile a public report

Submissions

The Consultant will be selected in accordance with the objectives and procedures as set.

Interest parties may obtain the Terms of Reference on the TRBR website <https://www.trbr.vu>

Expressions of interest must be delivered to the address below by Close of Business at 4:00pm on 12th of April 2019.

TO: EOI – Quality of Service Benchmarking

Telecommunications Radiocommunications & Broadcasting Regulator

A: PO Box 3547, 1st Fl. Oceanwalk Building, Lini Highway

Port Vila, VANUATU

T: +678 27621 | **F:** +678 27440

E: enquiries@trbr.vu

W: www.trbr.vu

DESCRIPTION OF SERVICES/TERMS OF REFERENCE

1. Introduction

The office of the Telecommunications Radiocommunications and Broadcasting Regulator (TRBR) was established by an Act of Parliament called the Telecommunications Radiocommunications and Broadcasting Regulation Act 2009 as amended by Amendment 22 of 2018 (“the Act”) where it, among other things mandated TRBR to regulate the telecom sector.

Since its establishment in 2008, the TRBR has witnessed an increasing and tremendous growth in the telecommunications sector throughout the country. In 2012, the Government of Vanuatu launched the Universal Access Policy (UAP). In the policy was stated that by the 1st of January, 2018 98% of the population of Vanuatu would have (and continue to have) access to mobile telephony services: voice, narrowband data services, SMS and broadband internet services. Since then, the TRBR has been working with the two main Telecom Operators to accomplish this. As all these developments take place it draws the TRBR to establish a baseline and regularly monitor the performance of service provider networks to ensure the subscribers obtain a quality service.

Vanuatu is among the developing countries in the world and is in need of in-depth expertise in carrying out this QoS benchmarking activity.

2. Background

As a follow up continuation of the UAP, the TRBR has sought to conduct a QoS benchmarking exercise. Keeping in mind that 98% of the population of Vanuatu has access to mobile services, it is necessary that we perform a thorough measurement of the quality of service throughout the country.

Vanuatu is made up of around 82 islands of which 65 is inhabited. The islands are stretched over a boundary of 1,300 kilometers and has an estimated total population of 240,000.

There are 2 main telecom operators in Vanuatu – Telecom Vanuatu Limited (TVL) and Digicel (Vanuatu) Limited. Both have upgraded their networks to 4G LTE covering the two main towns Luganville and Port Vila. Luganville is on Santo Island while the capital Port Vila is on Efate Island. They both have individual 4G LTE sites at the provincial headquarters at Malekula, Pentecost and Tanna Island. Furthermore, they have sites in almost all the inhabitant islands with 2G and 3G services. However, in some areas there may be only one operator while the other covers another part of the island.

In the rural areas, the road infrastructure is a major disadvantage when carrying out optimization or measuring QoS. Most areas are accessible by vehicle or boat while others on foot. Due to the poor infrastructure transport costs are very high especially when hired.

Inter-island travelling is possible by air and sea. Airfares may be subject to availability of flights and distance between islands. Travelling by ship maybe time consuming although cheap.

Grid power is only available in the two towns and provincial headquarters on Malekula and Tanna. With that, most sites are dependent on solar power and standby generator sets. Thus, sites in the rural areas are dependent on the weather and delivery of fuel on islands which can only be done through ships.

3. Terms of Reference

The objectives of the QoS benchmarking activity as previously outlined aims to ensure services that are being provided by service providers in Vanuatu meets the standard of internationally recognized institutions and that the results are reported publically so that the public can make informed choice and understand the market better. It will also provide a timely and relevant information that the TRBR can use to assist the government in policy making based on hard evidence.

The expected scope of work to accomplish these objectives is:

- Conduct measurements according to the QoS parameters (Appendix A) that are provided by TRBR
- Measurements must include stationary, drive-test for large islands (Santo, Malakula, Efate, Pentecost and Tanna) and walk-test particularly in the main populated towns, Luganville, Lenakel, Lakatoro, North Pentecost and Port Vila. Measurements must also be done in the following areas identified in Appendix B
- Based on the results and evaluation of measurements, a report must be produced that will be available to the Operators and the general public. The measurements results will be presented in dis-aggregated form by Operator and aggregated form by island/sector.
- A coverage map must be produced that shows coverage strength and QoS results based on actual data and estimated data for untested areas
- Must engage TRBR officers in the process and to pass on knowledge and skills of QoS benchmarking.
- Work is expected to start during Quarter 2 and to be completed by the mid of Quarter 3 of 2019.

The vendor is expected to provide clear and concise proposal of how it will be able to carry out the scope of work provided and provide quote for TRBR.

_ End of ToR_

APPENDIX A – QoS PARAMETERS

MOBILE VOICE PARAMETERS		
PARAMETERS	THRESHOLD/STANDARD	COMMENTS/REFERENCE
AVAILABILITY		
Network Availability		Network Availability throughout duration at the area of the assessment
Rx Signal Level	≥-95dBm	To check for received signal strength at the area of assessment Reference: Framework for the Assessment of Service Quality of Telecommunications Systems and Service, CA, 2017
Voice/Data Coverage		Coverage map for Voice and Data service
ACCESSIBILITY		
Call Set up time	< 10s	Time it takes to initiate a call Reference: ITU-T Recommendation E.807
Call successfully connected	>98%	Rate of successfully connected calls over the total calls initiated Reference: Framework for the Assessment of Service Quality of Telecommunications Systems and Service, CA, 2017
SMS Establishment Rate	>95%	Rate of successfully sending an SMS References: ETSI EG 202 009-2 V1.3.1 ETSI EG 202 057-2 V1.3.2 (5.6.2) ETSI TS 102 250-2 V2.3.1 (7.4.4 – completion failure ratio) ETSI TS 102 250-5 V2.4.1
RETAINABILITY		

Call Drop Rate	≤2%	Rate of calls forcibly dropped over total number of calls made Reference: ESTI ES 202 765-2(7.4)
Handover Success Rate	≥96%	Rate of calls successfully transferred either soft or hard handover. Reference: Framework for the Assessment of Service Quality of Telecommunications Systems and Service, CA, 2017
INTERGRITY		
Call Set up time	<10 s	Time it takes to initiate a call Reference: ITU-T Recommendation E.807
Voice Quality (MoS)	5	ITU-T P 800
SMS End-to-End Delivery time	>95% in less than 20s	Rate of successfully sending an SMS within 20s over total number of SMS sent References: ETSI EG 202 009-2 V1.3.1 ETSI EG 202 057-2 V1.3.2 (5.6.3) ETSI TS 102 250-2 V2.3.1 ETSI TS 102 250-5 V2.4.1
Bill correctness (SMS/Voice/Data)		Validate billing for each services. (vt/sms; vt/sec; vt/mb)
MOBILE DATA PARAMETERS		
PARAMETERS	THRESHOLD/STANDARD	COMMENTS/REFERENCE
AVAILABILITY		
Network Availability		Network Availability throughout duration at the area of the assessment
Rx Signal Level	>-95dBm	To check for received signal strength at the area of assessment Reference: Framework for the Assessment of Service Quality of Telecommunications Systems and Service, CA, 2017
Web-page Download		
Data Establishment Rate	95% within 20 seconds	Set up success rate for the page to completely load Reference: Framework for the Assessment of Service Quality of Telecommunications Systems and Service, CA, 2017

Packet loss	<2%	
DL/UL Speed	>25Mbps/15Mbps	Average LTE speed given that the test device will be set to Auto connect mode with LTE being the priority
File Download/Upload		*No specific file size but the same should be used throughout test
Data Establishment Rate	>95%	Set up success rate for the page to completely load Reference: Framework for the Assessment of Service Quality of Telecommunications Systems and Service, CA, 2017
DL/UL Speed	>25Mbps/15Mbps	Average LTE speed given that the test device will be set to Auto connect mode with LTE being the priority
Youtube Video		
Data Establishment Rate	>98%	Set up success rate for the page to completely load Reference: Framework for the Assessment of Service Quality of Telecommunications Systems and Service, CA, 2017
Start time	<5s	Duration for when video actually starts to play

APPENDIX B - Measurement Areas

- Santo Island
- Tanna Island
- Malakula Island
- Efate Island
- Port Narvin – Erromango Island
- East Epi – Epi Island
- Tongoa Island – Tongoa Island
- North Paama – Paama Island
- West Ambrym – Ambrym Island
- West Ambae – Ambae Island
- South Maewo – Maewo Island
- North Maewo – Maewo Island
- Vanualava – Banks Islands
- Loh Island – Torres Islands

APPENDIX C – Map of Vanuatu

