



**Independent Communications Authority of South Africa**

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**APPOINTMENT OF A SERVICE PROVIDER TO CONDUCT MEASUREMENTS FOR BENCHMARKING OF THE MOBILE NETWORKS PERFORMANCE AND QUALITY OF SERVICE IN NINE (9) PROVINCES FOR A PERIOD OF TWELVE (12) MONTHS.**

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**1. Purpose**

Procurement of the services of an external service provider to assist the Authority to conduct measurements for benchmarking of mobile networks performance voice and data services within the nine (9) provinces for a period of twelve (12) months.

The bid will be advertised for a period of 21 calendar days in the e-tender portal, and ICASA's website.

**2. Background**

The Authority is mandated to ensure the provision of good quality of service by licensed telecommunications operators and service providers. ICASA's function is to protect and promote the interests of consumers with regard to the price, quality, and variety of communication services.

Quality of Service can be described as the ability of a network to provide a service at an assured service level. This can be measured by the mobile network operators themselves, an independent or a regulatory organisation.

The Engineering and Technology division's strategic objective is to protect the rights of consumers by promoting the delivery of the quality of services to consumers and other stakeholders. To give effect to this objective, QoS monitoring will cover selected areas within all nine (9) provinces.

The Authority, therefore, intends to appoint a competent service provider to benchmark QoS for:

- mobile voice by Cell C, MTN, Telkom, and Vodacom
- mobile data (broadband) services offered by Cell C, MTN, Telkom, Vodacom, and Rain in a multi-vendor, multi-technology environment.

### **3. Scope of work**

- 3.1. The Authority invites bids from eligible service providers for benchmarking and monitoring of mobile voice and data services in the nine (9) Provinces (Free State, Limpopo, KwaZulu-Natal, Mpumalanga, Northern Cape, Western Cape, Eastern Cape, Gauteng, and North West).
- 3.2. The Authority intends to appoint a service provider to conduct QoS measurements for mobile voice and data services offered by mobile operators in multi-technology (2G, 3G, 4G, and 5G) environments.
- 3.3. The objective of this benchmarking and monitoring is to ascertain the effectiveness of mobile networks to provide acceptable services and identify issues in each specific network for the Authority to mitigate the non-performance.
- 3.4. The key objectives of the project are:
  - 3.4.1. to conduct QoS measurements in the nine (9) provinces.
  - 3.4.2. to analyse the end-to-end mobile quality of service from subscribers' perspective.
  - 3.4.3. to benchmark mobile voice QoS performance of the mobile network operators: Cell C, MTN, Telkom, and Vodacom.
  - 3.4.4. to benchmark mobile data services QoS performance of the mobile network operators: Cell C, MTN, Telkom, Vodacom, and Rain.
  - 3.4.5. to conduct special measurements on:
    - 3.4.5.1. 5G data services coverage and performance for existing 5G networks.
    - 3.4.5.2. mobile voice and data service measurements along the Gautrain routes.
  - 3.4.6. to produce a detailed reports as agreed with the Authority.
  - 3.4.7. to ensure a full skill transfer towards twenty (20) ICASA personnel in the area of QoS monitoring. Training shall occur during the project implementation and must focus on QoS parameters, measurement methodology as well as measurement and analysis tools.
  - 3.4.8. Training materials must be provided to the attendees.

3.5. The results will provide an indication of the quality of service experienced by end-users of mobile voice and data services and help in identifying areas where network performance may need to be improved.

### **3.6. Drive Test & Benchmarking Parameters**

3.6.1. The key target parameters include, but not limited to the following:

#### 3.6.1.1. Voice service parameters

- Call Retention: Drop Call Rate;
- Call Accessibility: Call Setup Success Rate;
- Call Setup Time; and
- Voice Quality.

#### 3.6.1.2. 3G, 4G and 5G Data service parameters

- Latency: Ping;
- Video streaming: YouTube video streaming and Video Mean Opinion Score (VMOS);
- Web Browsing: Static Pages and Live web browsing; and
- File sharing download and upload speed: 3G preferred, 4G preferred and 5G Preferred.

3.6.2. The key target parameters settings and configurations on the measurement and post-processing tools must be aligned to SANS 1725-01, SANS 1725-02, ETSI and Annexure A.

### **3.7. Methodology**

3.7.1. The proposal shall contain a detailed methodology and approach to attain the project objectives.

3.7.2. The proposed methodology must:

3.7.2.1. outline the resource requirements and man-hours, hardware/software tools and expertise that will be required during the project.

3.7.2.2. include the system and test server's configuration, and occupational health and safety (OHS) plan.

3.7.2.3. include data sheets for the proposed measurements and post processing tools.

3.7.2.4. outline how the proposed methodology is aligned to best practices and standards such as ITU, ETSI, SANS 1725-1 and SANS 1725-2.

- 3.7.3. The bidder(s) shall provide a detailed project plan which include scope, time, cost, quality, human resources, communications, risk, and procurement management plan.
- 3.7.4. The Service Provider will be required to submit weekly progress/status reports during the implementation of the project.
- 3.7.4.1. The Authority and the service provider will determine the content of the weekly progress report.
- 3.7.4.2. A final QoS report shall be submitted for each province after completion of a drive test for the province.
- 3.7.4.3. The service provider shall also provide a project closure report at the end of the project.
- 3.7.5. The Project Leader shall do the ongoing management of the service in accordance with the service level agreement.
- 3.7.6. Mobile voice measurements will be measured with a device set in the best available technology mode with VoLTE disabled; whereas mobile data services will be tested with a device set in 3G, 4G and 5G Preferred modes. A detailed list of parameters is shown in Appendix B.
- 3.7.7. 3G,4G and 5G for mobile data and static measurements will also be measured in the selected targeted areas.
- 3.7.8. The details of the test plan shall include measurement profiles as defined in Appendix B for voice and mobile data services.
- 3.7.9. The Service Provider must provide 5G measurement profiles.

### **3.8. Roles and Responsibilities**

- 3.8.1. The differentiation of roles and responsibilities between ICASA and the prospective bidder is shown in table 1:

**Table 1: Responsibility matrix**

	<b>Activity</b>	<b>ICASA</b>	<b>Bidder</b>
1	Field Measurements Tools (Software and Hardware) including licences		x
2	Provisioning of Airtime and Data Bundles	x	
3	Mapping and Routes planning	x	x
4	Post-processing and analysis tools		x
5	Data and Voice Quality Test Server		x

6	Vehicles (fuel and tolls, any other vehicle related expenses)		x
7	OHS	x	x
8	Training of ICASA personnel		x
9	Generation of measurements report and writing of the QoS report.	x	x
10	Logistics, accommodation, and allowance for ICASA's personnel.	x	
11	Logistics, accommodation, and allowance for Service Provider's personnel		x

### **3.9. Logistics and Accommodation**

- 3.9.1. The appointed bidder will be responsible for logistic arrangements such as accommodation, daily allowances, and transportation of its staff during the implementation of the project.
- 3.9.2. ICASA will be responsible for logistics, allowance, and accommodation for its own staff.
- 3.9.3. It is the responsibility of the service provider to comply all health and safety protocols when conducting work on behalf of the Authority.

### **3.10. Route planning and target areas.**

- 3.10.1. ICASA will provide a route plan and waypoints for areas indicated in table 3 and 4 of Appendix A.
- 3.10.1.1. Table 3 shows areas targeted for the mobile voice and data (3G and 4G) measurements and three (3) static/stationary points per area of interest.
- 3.10.1.2. Table 4 depicts areas targeted for the 5G mobile and static data measurements points.
- 3.10.2. 5G mobile and static data measurements in the seven (7) Metropolitan Municipalities and 5 static points will be measured per metropolitan municipality. Details in table 4 of Annexure A
- 3.10.3. The final routes will be finalised with the appointed service provider before start of the project.
- 3.10.3.1. There are five (5) areas of interest per province of which voice and data (3G and 4G) measurements will be conducted by a way of a drive test methodology.

3.10.3.2. Drive test distance is estimated at 300 km per area of interest and thus 3000 km is a total drive test distance per province.

3.10.3.3. Phase 1 requires a drive-test distance of 1500 km and Phase 2 requires a drive test distance of 1500 km which is 3000 km in total.

#### **4. Period of assignment**

- 4.1. All work is to be carried out in accordance with the time schedule as agreed with the Authority.
- 4.2. The project is expected to be completed within twelve (12) months from the date of the award.
- 4.3. Drive tests and stationary tests for data services will only be conducted in one phase.
- 4.4. Drive tests for voice services will be conducted in two (2) phases i.e., phase 1 and phase 2 (re-drive).

#### **5. Briefing Session**

- 5.1.1. There will be a non-compulsory virtual briefing session.

#### **6. Bid evaluation**

6.1. The received bids will be evaluated on the 80/20 procurement principle as per the Supply Chain Management Policy and the relevant Treasury Regulations:

- 6.1.1. Submission of the required documents
- 6.1.2. Functionality, and
- 6.1.3. price/BBBEE on an 80/20 procurement principle.

6.2. Only bidders who meet the cut-off score of 80 points out of 100 points for functionality will be considered further for price evaluation.

6.3. Bids will be evaluated for functionality in line with the following criteria:

Table 1: Bid evaluation categories and Weights

<b>No</b>	<b>Category</b>	<b>Weight</b>
<b>A.</b>	<b>Price</b>	<b>80</b>
<b>B.</b>	<b>BBBEE Status Level Contribution</b>	<b>20</b>

	<b>TOTAL</b>	<b>100</b>
<b>C.</b>	<b>Functionality: Pre-qualification criteria</b>	
<b>1.</b>	<p><b>Drive test methodology</b></p> <p>Drive test methodology provided include:</p> <ul style="list-style-type: none"> <li>a) Details of the Test plan,</li> <li>b) Details of the Measurement tools including datasheets,</li> <li>c) Details of the Processing tools including datasheets,</li> <li>d) Details of Test servers (software and hardware)</li> <li>e) Details on how the proposed methodology is aligned to Standards (ETSI, South African National Standards (SANS) and ITU)</li> <li>f) Occupational Health and Safety plan.</li> </ul> <p>5 = Methodology includes information on all the items listed above.</p> <p>3 = Methodology includes information on the items a) – d) listed above and any one of e) - f).</p> <p>1 = Methodology does not include all the items on a) – d) listed above.</p>	<b>40</b>
<b>2.</b>	<p><b>Proposed Project Plan</b></p> <p>The bidder provided a <u>detailed project plan</u> which include:</p> <ul style="list-style-type: none"> <li>a) Milestones,</li> <li>b) Work Breakdown Structure,</li> <li>c) Time Schedule,</li> <li>d) Human Resource plan (resource allocations),</li> <li>e) Responsibility Matrix,</li> <li>f) Risks, and</li> <li>g) Contingency Plans.</li> </ul> <p>5 = A project plan submitted has all the items listed from a) – g).</p> <p>3 = A project plan submitted has any six (6) of the items listed a) – g).</p> <p>1 = No project plan submitted, or project plan with any five (5) or less of the items listed a) - g)</p>	<b>20</b>

<p><b>3.</b></p>	<p><b>Provide reference letters on a referee company letterhead showing the QoS drive test measurements for mobile services conducted in the past/current, from contactable referees.</b></p> <p>5 = Provide four or more testimonial reference letters of work conducted in relation to QoS measurements.</p> <p>4 = Provide three (3) testimonial reference letters in relation to QoS measurements.</p> <p>3 = Provide two (2) testimonial reference letters in relation to QoS measurements.</p> <p>2 = Provide one (1) testimonial reference letter in relation to QoS measurements.</p> <p>1 = No submission of testimonial reference letters.</p>	<p><b>10</b></p>
<p><b>4.</b></p>	<p><b>Provide skills transfer plan for twenty (20) ICASA staff members with timeframes.</b></p> <p>5 = A skills transfer plan which includes training plan, timeframes, objectives and working methodology.</p> <p>4 = A skills transfer plan which includes training plan, timeframes, and objectives</p> <p>3 = A skills transfer plan with only training plan and timeframes</p> <p>2 = A skills transfer plan submitted without timeframes</p> <p>1 = No skills transfer plan submitted</p>	<p><b>10</b></p>
<p><b>5.</b></p>	<p><b>Provide previous experience in producing high-quality reports that can be used internally and for publication in the media in the form of sample reports. NB:(sample reports need to be related to the references letters provided. In case where confidentiality is involved a redacted version of the report must be submitted.)</b></p> <p>5 = 4 sample reports (2 x data and 2 x voice sample reports) or more.</p> <p>4 = 3 sample reports (2 x data and 1 x voice sample reports or 1 x data and 2 x voice sample reports).</p>	<p><b>10</b></p>



	<p>3 = 2 sample reports (1 x data and 1 x voice sample reports).</p> <p>2 = 1 sample reports (1 x data or 1 x voice sample report).</p> <p>1 = no submission of sample reports.</p>	
<b>6.</b>	<p><b>Key personnel competency in similar projects. Provide curriculum vitae of key personnel and project members. Bidders to specify the project members relevant qualifications in the engineering field e.g., B.Sc. (Electrical or Electronic, computer science).</b></p> <p>5 = Key personnel has five or more years' experience in similar projects and two or more of the project members have relevant qualifications</p> <p>4 = Key personnel has four years' experience in similar projects and two or more of the project members has relevant qualifications</p> <p>3 = Key personnel has three years' experience in similar projects and two or more of the project members has relevant qualifications</p> <p>2 = Keys personnel has two years' experience in similar projects and two or more of the project members has relevant qualifications.</p> <p>1 = key personnel have less than two years' experience in similar projects and two or more of project member has relevant qualifications</p>	<b>10</b>
	<b>TOTAL FOR FUNCTIONAL PRE-QUALIFICATION CRITERIA.</b>	<b>100</b>

## APPENDIX A: TARGET AREAS AND MEASUREMENTS TYPE

Table 2: Voice, and 3G and 4G Data (Mobile and Static) measurements Targeted Areas

Province	District	Target Local Municipality	Number of Target areas	Voice	3G and 4G Data (Mobile and Static)
Northern Cape	Namakwa	Nama Khoi	1	Yes	Yes
		Richtersveld	1	Yes	Yes
		Hantam	1	Yes	Yes
	N/A	N14 Road	1	Yes	Yes
	John Taolo Gaetsewe	Ga-Segonyana	1	Yes	Yes
Free State	Thabo Mofutsanyane	Maluti	1	Yes	Yes
		Nketoana	1	Yes	Yes
		Dihlabeng	1	Yes	Yes
	Lejweleputswa	Tswelopele	1	Yes	Yes
		Masilonyana	1	Yes	Yes
Western Cape	West Coast	Matzikama	1	Yes	Yes
		Cederberg	1	Yes	Yes
		Saldanha Bay	1	Yes	Yes
	City of Cape Town	City of Cape Town	1	Yes	Yes
	Cape Winelands	Drakenstein	1	Yes	Yes
Eastern Cape	Alfred Nzo	Mbizana	1	Yes	Yes
		Umzimvubu	1	Yes	Yes
	Chris Hani	Ngcobo	1	Yes	Yes
		Lukanja	1	Yes	Yes
	Amathole	Mbhashe	1	Yes	Yes
KwaZulu-Natal	Umkhanyakude	uMhlabuyalingana	2	Yes	Yes
		Jozini	1	Yes	Yes
		Mtubatuba	1	Yes	Yes
	Zululand	uPhongolo	1	Yes	Yes
Limpopo	Capricorn	Lepelle-Nkumpi	2	Yes	Yes
	Greater Sekhukhune	Greater Tubatse	1	Yes	Yes
		Makhuduthamaga	2	Yes	Yes
North West	Ngaka Modiri Molema	Mahikeng	1	Yes	Yes
		Ratlou	1	Yes	Yes
	Bojanala Platinum	Kgetlengrivier	1	Yes	Yes
		Rustenburg	1	Yes	Yes
	Dr Kenneth Kaunda	City of Matlosana	1	Yes	Yes
Gauteng	City of Tshwane	City of Tshwane	2	Yes	Yes
	City of Johannesburg	City of Johannesburg	2	Yes	Yes
	Ekurhuleni	Ekurhuleni	1	Yes	Yes
Mpumalanga	Gert Sibande	Dipaleseng	1	Yes	Yes
		Lekwa	1	Yes	Yes
		Dr Pixley Ka Isaka Seme	1	Yes	Yes
		Mkhondo	2	Yes	Yes

Table 3: 5G Mobile Data and Static measurements Targeted Areas

<b>Target Metropolitan Areas</b>	<b>Estimated Distance</b>	<b>Static Points</b>
1. City of Cape Town	Yes (300 km)	5 points of interest within the drive test route
2. Nelson Mandela Bay	Yes (300 km)	5 points of interest within the drive test route
3. Buffalo City	Yes (300 km)	5 points of interest within the drive test route
4. City of eThekweni	Yes (300 km)	5 points of interest within the drive test route
5. City of Johannesburg	Yes (300 km)	5 points of interest within the drive test route
6. City of Tshwane	Yes (300 km)	5 points of interest within the drive test route
7. City of Ekurhuleni	Yes (300 km)	5 points of interest within the drive test route

## APPENDIX B: PARAMETERS

Table 4: Voice Measurement Profiles

Voice Call Parameter	Description
Accessibility: Short Call	Call Duration (10s) + 30 seconds (for the setup and release phases) + 30 seconds (for the minimum pause interval)
Retainability: Long Call	Call Duration (120s) + 30 seconds (for the setup and release phases) + 30 seconds (for the minimum pause interval)
Call Setup Time	Time taken to setup a call -Target is 20s
Voice Quality	Average Speech Quality of MOS must be greater than 3

Table 5: Data Measurement Profiles

Test Description	4G Pref	3G Pref
FTP Download	FTP DL (15 MB)	FTP DL (5 MB)
FTP Upload	FTP UL (5 MB)	FTP UL (1 MB)
HTTP Download	HTTP Get (15 MB)	HTTP Get (3 MB)
HTTP Upload	HTTP Put (3 MB)	HTTP Put (1 MB)
Ping sessions with size 32 bytes payload	Ping (32 bytes)	Ping (32 bytes)
Video streaming from YouTube during 60s	Video: YouTube	Video: YouTube
Downloading content from the test server	HTTP Browsing: Kepler	HTTP Browsing: Kepler
Download content from live web page (Gumtree, News24, MSN)	Live Web Browsing	Live Web Browsing
Packet Delay: Ping to <a href="http://www.google.co.za">www.google.co.za</a>	Ping (32 bytes)	Ping (32 bytes)