



Independent Communications Authority of South Africa
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ANNEXURE A

TECHNICAL SPECIFICATIONS ICASA 09/2018

1. Purpose of the Request for Proposal

The purpose of this Request for Proposal is to invite eligible institutions of higher learning (IHLs) and research institutes (RIs) to submit proposal(s) on the development, implementation, hosting and management of the Reference Geo-Location Spectrum Database as stipulated the Television White Spaces Regulations published in Government Gazette number 41512 (Notice 147 of 2018) (“the regulations”) by the Independent Communications Authority of South Africa (ICASA), as part of its engineering and technology programme. The project after implementation will be for a period of three (3) years.

2. Background

The scarcity of high demand spectrum is amongst the limiting factors in wireless communication systems to accommodate more users and incorporate more services. Allocating new spectrum for additional services and capacity is costly since the available spectrum is a limited resource and has been assigned to various wireless systems. These systems known as the licensed users have exclusive use of spectrum allocated to them. Contrary, to the congestion seen on the frequency occupancy, the actual spectral audits show that there are large idle spectral bands.

In terms of Chapter 5 and 6 of the ECA, ICASA is mandated to control, plan, administer and manage the National Radio Frequency Spectrum. In doing so, the Authority is expected to ensure efficient use of radio frequency spectrum.

The published Regulations on the use of Television White Spaces (TVWS) marked a step towards enabling affordable broadband through dynamic spectrum access technologies. In TVWS spectrum sharing, unused radio spectrum on terrestrial TV bands (470–694 MHz) is used in providing broadband internet services to the public and private organisations.

ICASA has initiated the TVWS project to assist with the development and implementation of a Reference Geo-Location Spectrum Database (R-GLSD) to perform baseline prediction calculations for the Countrywide TVWS availability maps and to generate Operational Parameters for White Space Devices (WSDs) to ensure regulatory compliance. The reference geolocation database will respond to TVWS device requests, containing the location of the device, whose frequencies are available in the device location.

To commence with the deployment of TVWS network to the public, it is required that ICASA commissions and deploys the R- GLSD which is an important tool to be used for the qualification of the Secondary Geolocation Spectrum Database (S-GLSD) providers. S-GLSD providers are required by the TVWS Regulations to enable wireless Internet network operators to provide TVWS-based broadband or narrowband services to the public.

Figure 1 below depicts on high level the deployment scenario of the TVWS network. The network operator or ISP will connect to the S-GLSD service provider, where it will request connection. In turn the service provider with all the details of the device, including the type approval ID, which would have been received from ICASA, will be verify from the R-GLSD and if found to be accurate will permit connection but if not will reject the request. The communication

between the R-GLSD, the S-GLSD and the WSD will be via protocols stipulated in the ETSI standards.

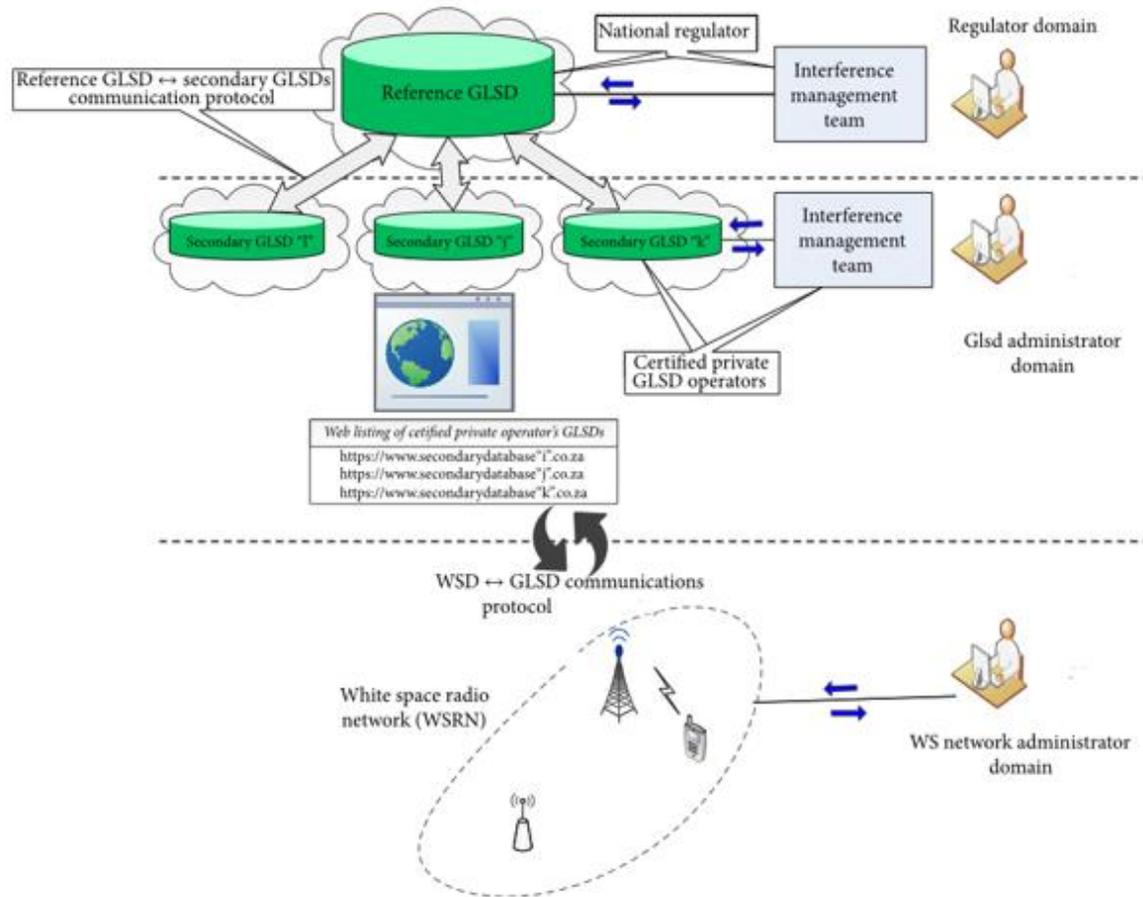


Figure 1 Geolocation Spectrum Database Network Architecture

3. Objectives of the Request for Proposal

Collaboration work between ICASA and the successful bidder meeting the required technical expertise is to develop, implement, host and manage the R-GLSD. TVWS services cannot be made available to the public unless both

the R-GLSD and S-GLSD are operational. Phase one (1) (this RFP) will be the implementation of R-GLSD, and phase two (2) will be the implementation and the qualification of the S-GLSD service providers.

The successful bidder for this RFP (i.e. Phase 1) should be able to do the following:

- i) Develop and implement the R-GLSD
- ii) Host and manage the R-GLSD for the project period
- iii) Provide competency training to ICASA personnel to operate and maintain the database. The bidder is to provide a detailed training plan.

Beyond deployment of the GLSDs, the collaborative efforts will encompass the following benefits:

- Implementation of TVWS regulations
- Capacity building and knowledge growth for those dealing with spectrum management, Dynamic Spectrum Access and TVWS
- Provision of a platform for sharing knowledge and exchange of expertise locally, within the region and internationally
- Through the promotion and organisation of seminars, symposiums, conferences and workshops, the field of spectrum management could be introduced to a wider audience.
- Increase the spectrum management capacity of ICASA and increase the scope to provide better spectrum related services in South Africa and to assist regionally and internationally.
- Increase regulation-making capacity to ensure proper professional rulemaking.

The eligible bidder will be expected to develop, implement, host and manage the R-GLSD as stipulated the Regulations published in Government Gazette number 41512 (Notice 147 of 2018) dated 23 March 2018 by the ICASA. The

development and implementation of the R-GLSD should be completed by 28 February 2019 and the hosting and management will be for a period of three (3) years.

3.1 R-GLSD Technical Requirements

Requirement	Description
Interface and Storage	<ul style="list-style-type: none"> • The system must be accessible online and provide a user-friendly graphical user interface (GUI) • Should display coverage map/footprint • The system must provide sufficient storage and be able to maintain up-to-date technical information and data sets of all incumbent services in the radio frequency band 470 MHz to 694 MHz • Provide sufficient storage to keep all records and historical data for tracking • The system must be able to maintain up-to-date "Type Approval" information and relevant information to determine the identity of all WSDs.
Operation	<ul style="list-style-type: none"> • Be able to calculate countrywide baseline coverage predictions of broadcast TV services in the radio frequency band 470 MHz to 694 MHz in accordance with the ITU GE06 agreement • Calculate countrywide baseline TVWS availability maps in the radio frequency band 470 MHz to 694 MHz, excluding the Radio Astronomy sub-band 606 MHz to 614 MHz and SKAAA demarcated polygons 1, 2 and 3 • Be able to update the algorithms or parameter values as requested by ICASA • Utilise the TVWS availability maps as regulatory limits when verifying the accuracy of S-GLSD
Security	<ul style="list-style-type: none"> • Providing ICASA with a secure login and log out feature • Provide robust communications security to prevent and protect from unauthorised data input and modification, and unauthorised alteration of stored data • Provide robust secure communications with S-GLSDs to prevent unauthorised parties from accessing or modifying information during transmission • Provide a secure communication protocol of an Application Programming Interface (API) for enabling seamless remote synchronisation with S-GLSDs for periodic verification, monitoring their accuracy and exchange of baseline datasets • Protection of primary incumbent contents

	<ul style="list-style-type: none"> • Alarm and reject requests for the use of Radio Astronomy service in the radio frequency sub-band 606 MHz to 614 MHz with protection thresholds prescribed in ITU Recommendation 769 • Alarm and reject requests for the use of Radio Astronomy service in demarcated polygons in the Karoo Astronomy Advantage Areas (KAAAs) 1, 2 and 3 in compliance with the Astronomy Geographic Advantage Act (AGA Act No. 21 of 2007) • Alarm and reject requests for the use of TV Broadcasting and Radio Astronomy services operating in the radio frequency band 470 MHz to 694 MHz as prescribed in ITU GE06, ITU Recommendation 769, as well as in accordance with the Memorandum of Understanding (MoU) of the Communications Regulators Association of Southern Africa (CRASA)
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The successful bidder is expected to have in-depth knowledge of at least the following:

- Full understanding of the regulations of the TV White Space.
- Understanding the state and use of the spectrum - monitoring the use of the spectrum, including usage of licence-exempt spectrum and availability of "white spaces" including the use thereof.
- Encourage spectrum efficiency, spectrum liberalisation and defining alternative spectrum licensing regimes – e.g. spectrum usage rights, Electro- Magnetic Compatibility (EMC) levels, dealing with spectrum fragmentation, spectrum sharing, and propagation studies.
- Economic value of spectrum and innovative administrative techniques – such as pricing and trading, spectrum ecosystem, sector studies and forecasting, spectrum parks, spectrum-trading units, spectrum map grids, etc.
- Understanding dynamic and opportunistic spectrum management.
- The development, implementation, hosting and management of the R-GLSD.
- The implementation of the Television White Space (TVWS) Regulatory Framework.

4. Evaluation Criteria

Bidders scoring below 80 for the functionality criteria will not qualify for further evaluation.

DESCRIPTION	WEIGHT
<p>Proposed solution/methodology The bidder must provide detailed comprehensive, methodology and proposed solution that includes the following:</p> <ul style="list-style-type: none">• The system architecture overview;• Clear view of communication protocols used;• Proof of compliance with ITU, ETSI specifications and standards;• Proof of system interoperability• A detailed list of unique features or benefits that will set your company apart of other competitors in relation to the required solution.• Transfer of knowledge and competency training plan for ICASA personnel to operate and maintain the database.	30
<p>Project Implementation Plan The bidder must provide its implementation plan on this project with the development and implementation of the R-GLSD to be completed by 28 February 2019. The hosting and management function must run for three (3) years. The plan must show how the budget is determined and show how budget and other parameters are aligned with performance indicators.</p>	15
<p>Qualification Bidders human resources should include degrees or equivalent qualifications in engineering or telecommunications or economics, and or commerce or any other equivalent qualification relevant to DSA and TVWS research and development, from a recognised institution.</p>	30
<p>Experience The bidder should have demonstrable significant experience of minimum 3 years or more experience in successfully delivering a project of similar nature. At least three (3) contactable references should be provided. The bidder should have demonstrable significant experience in DSA and implementation of TVWS. The bidder must have experience in developing models and tools for DSA including Geo-Location Spectrum Database. Any certifications from other organisations, where relevant, should be mentioned.</p>	25

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5. Deliverables and Timeframes

The proposed implementation plan for Phase 1 of TV Whitespace geolocation spectrum database should be of a timeframe of four (4) months. The successful bidder is expected to meet this timeline (4 months), with a fully functional R-GLSD, and thereafter host, manage and maintain the R-GLSD for a period of 3 years.

6. Response Format

The bidders shall submit its response in accordance with the response format specified below;

I. Introduction and Background

II. Value Proposition

III. Products and Offering – covering the following:

- 1.** Detailed research and development methodology, approach and research infrastructure currently in place (including collaborations and leverages).
- 2.** Research and development material and equipment (e.g. laboratories, hardware and software).
- 3.** Specific research and development work currently being carried out and associated outcomes and plans.
- 4.** Proposed methodology and approach and envisaged outcomes for this RFP.
- 5.** Project solution(s) in this Request for Proposal (RFP) and motivation hence forth.
- 6.** Resources and infrastructure to be used for this RFP.
- 7.** Work plan showing key performance areas, aligned with budget.
- 8.** Work Breakdown Structure

9. Resource Plan and Allocation

10. Transfer of knowledge and competency training plan for ICASA personnel to operate and maintain the database

IV. Company Information

1. Credentials of successful bidder
2. Structure of the company

7. Briefing Session

There will be a compulsory briefing session.