

Shared Spectrum Strategies to Increase Affordable Access in Rural Areas

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science & innovation

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Science and Innovation
REPUBLIC OF SOUTH AFRICA

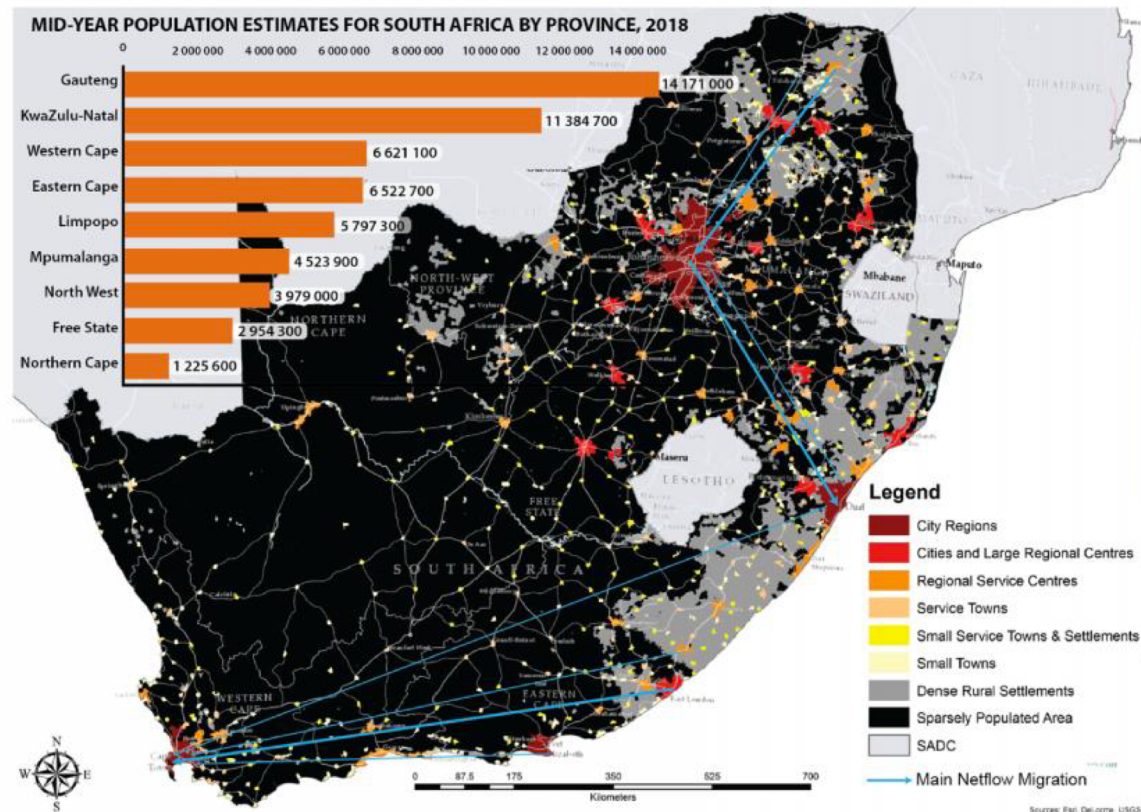


Contents

- Overview of CSIR and its TVWS activities
- Overview of TVWS activities across the continent
- TVWS Ecosystem development in South Africa
- CSIR's application of a Geo-Location Spectrum Database beyond TVWS

South Africa - Overview

SETTLEMENT TYPOLOGY DISTRIBUTION



Metropolitan Areas, Cities and Big Regional Towns
Total Population 1 29 633 727
53% of SA Population (2016)

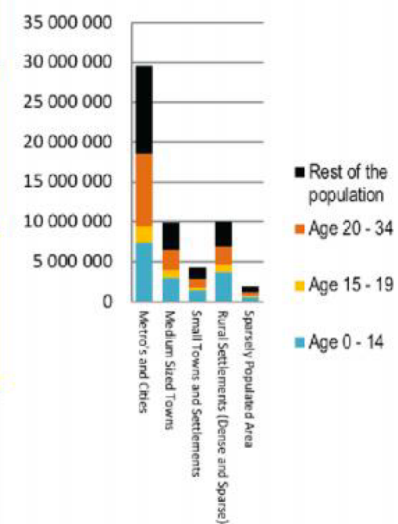
Medium Sized Towns with Regional Service Function
Total Population 1 9 951 815
18% of SA Population (2016)

Rural Service Centres & Small Towns
Total Population 1 4 328 976
8% of SA Population (2016)

Dense & Scattered Rural Settlements
Total Population 1 10 006 387
18% of SA Population (2016)

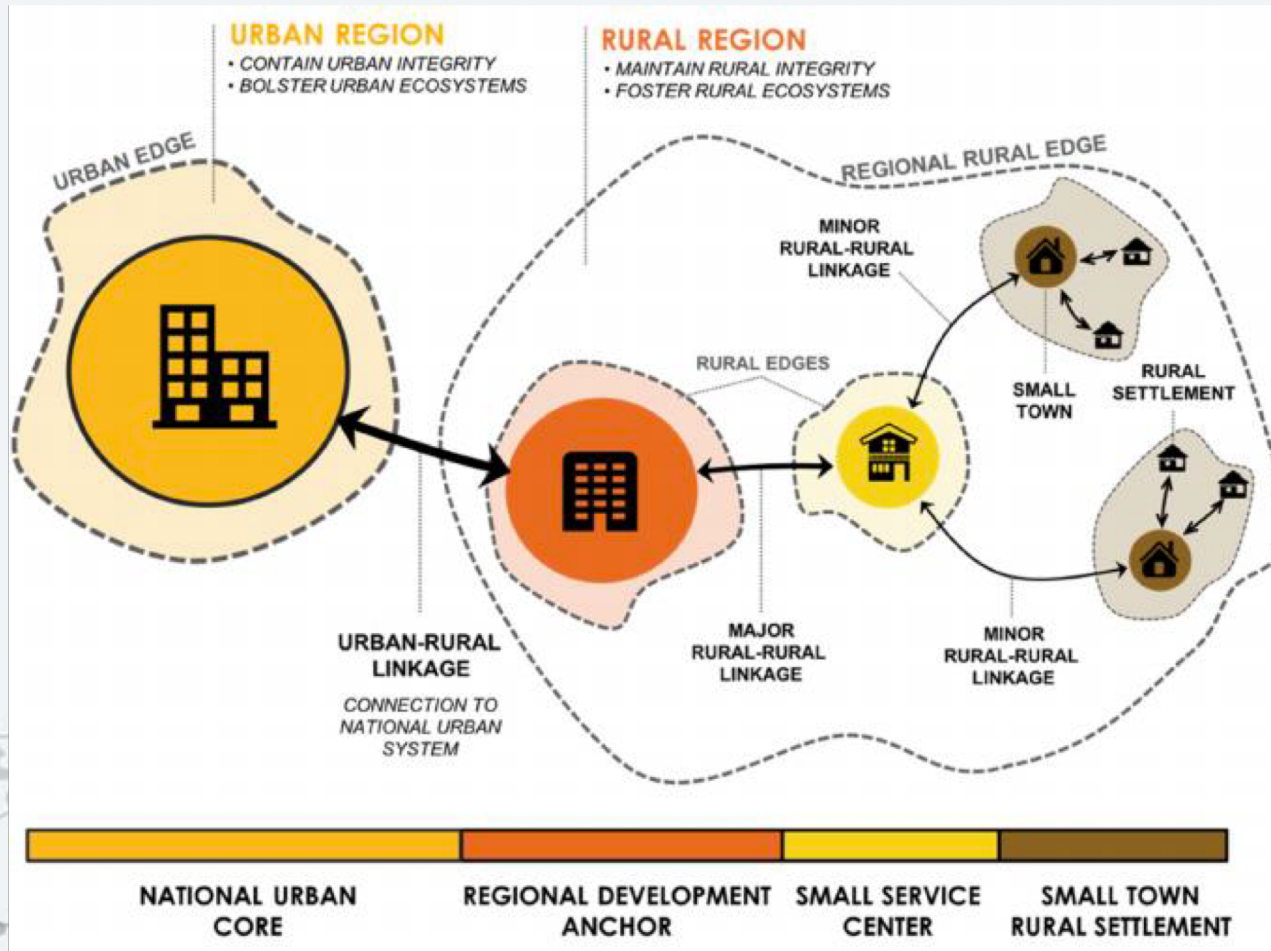
Sparse Settlements
Total Population 1 1 871 207
3% of SA Population (2016)

POPULATION, YOUTH AND TYPES OF SETTLEMENTS



Population Characteristics and Settlement Dynamics Based on StatsSA, 2011, 2018; Quantec 2016, CSIR Town Typology 2018, Vulnerability and Migration Indicators – See Annexure A

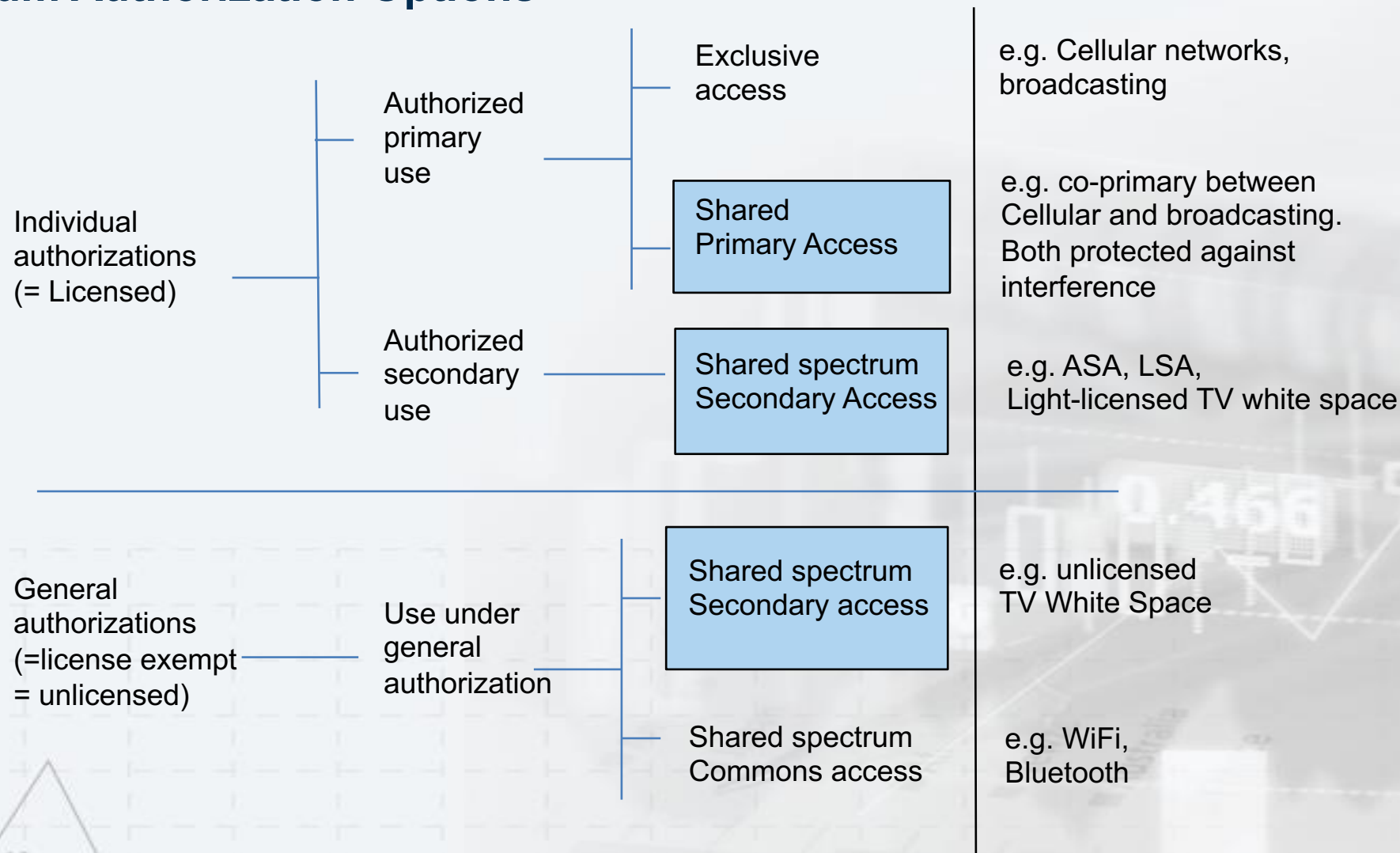
Regional rural development model (Differentiate between urban and rural solutions)



- Sustainable rural development
- Identification, development and strengthening of 'regional development anchors' in rural areas, to
 - 1) connect urban to rural areas in mutually-beneficial ways, and
 - 2) act as catalysts for regional-rural development
- Need to solve both access and backhaul

CSIR Solution starts with Spectrum Authorization Options

Risk of Interference



Cost of deployment

Position on Dynamic Spectrum management



The Authority's Position

- That the DSA concept is applicable across the Radio Frequency band, and
- That TVWS is the first phase of the DSA implementation in the TV band

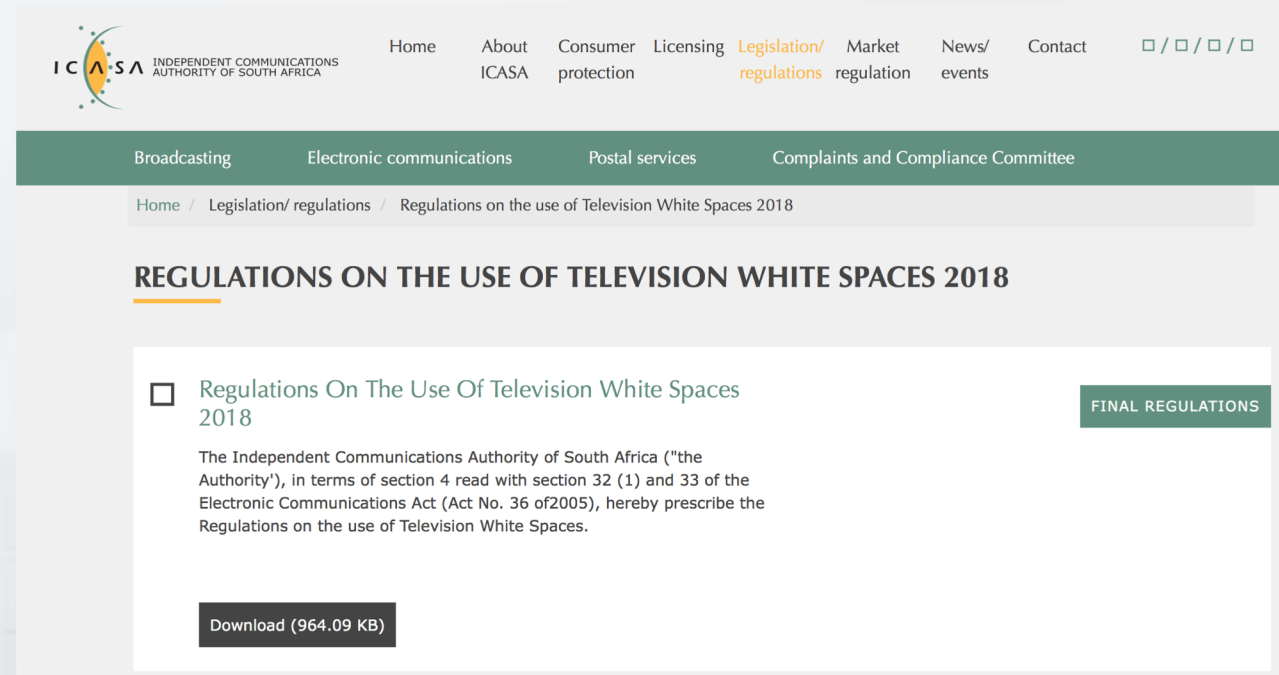
TVWS timeline in South Africa



TVWS Regulations in South Africa

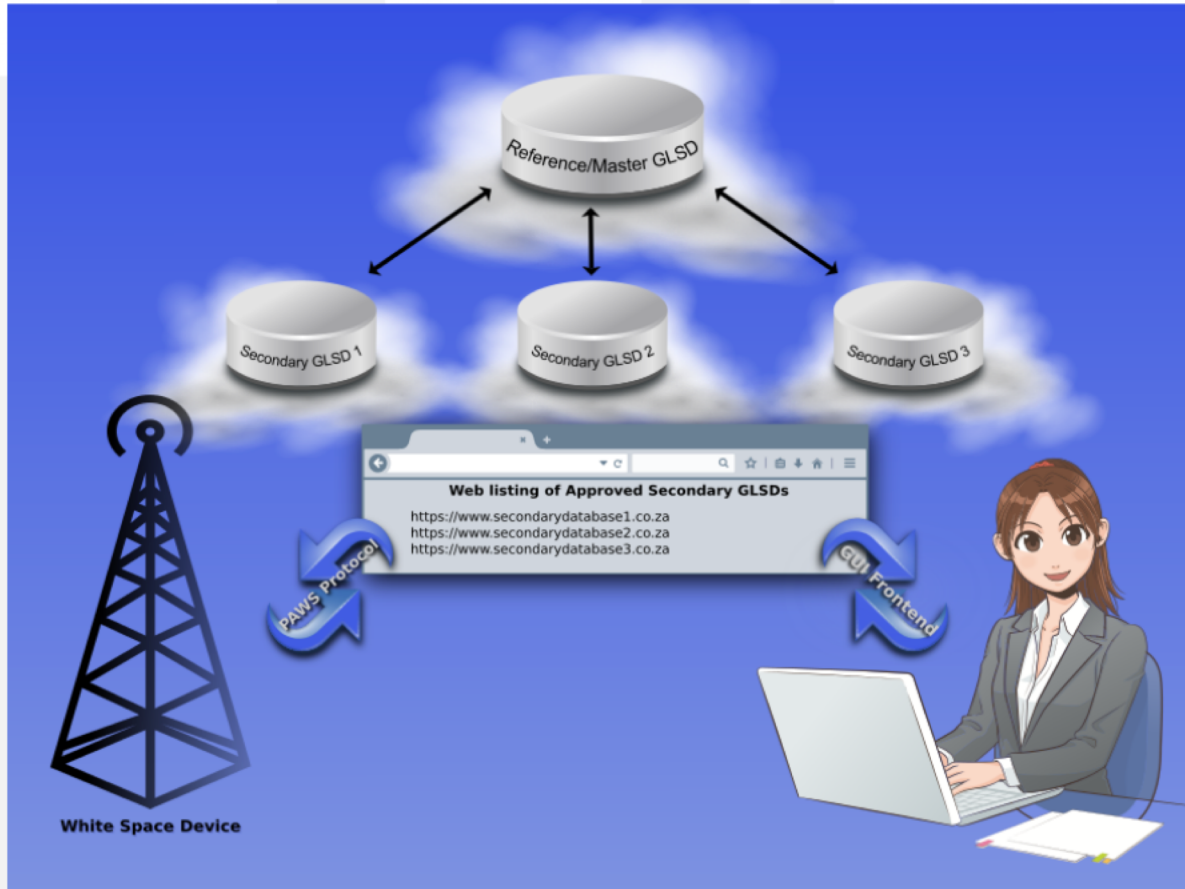
“The DSA is excited that TVWS regulations are being considered in a number of other countries in Africa including Botswana, Ghana, Kenya, Malawi, Nigeria, Mozambique and Tanzania, and we believe South Africa’s actions will spur more regulators in the region and around the world to move rapidly,” added Gude.

<https://www.icasa.org.za/legislation-and-regulations/regulations-on-the-use-of-television-white-spaces-2018>



The screenshot shows the ICASA (Independent Communications Authority of South Africa) website. The top navigation bar includes links for Home, About ICASA, Consumer protection, Licensing, Legislation/regulations (highlighted), Market regulation, News/events, and Contact. Below this is a secondary navigation bar with links for Broadcasting, Electronic communications, Postal services, and Complaints and Compliance Committee. The main content area displays the title "REGULATIONS ON THE USE OF TELEVISION WHITE SPACES 2018" with a breadcrumb trail: Home / Legislation/ regulations / Regulations on the use of Television White Spaces 2018. A document icon precedes the title. A green button labeled "FINAL REGULATIONS" is positioned to the right. The text below states: "The Independent Communications Authority of South Africa ('the Authority'), in terms of section 4 read with section 32 (1) and 33 of the Electronic Communications Act (Act No. 36 of 2005), hereby prescribe the Regulations on the use of Television White Spaces." A "Download (964.09 KB)" button is located at the bottom of the document preview.

TV Whitespaces ecosystem – South Africa progress



- Policy – NRFP published May 2018
- Regulations – March 2018
- Reference GLSD – Commissioned March 2019
- Secondary GLSD – To be announced soon
- White Space Device – Must be type approved (ETSI emission classes)
 - Proprietary – Adaptrum, Carlson Wireless
 - Standard – White Space Alliance?, 3GPP?
- CPEs

A Reference GLSD for ICASA

tvwhitespaces.icasa.org.za

ICASA

INDEPENDENT COMMUNICATIONS
AUTHORITY OF SOUTH AFRICA

CSIR

our future through science

username

password

login

Reference Geolocation Spectrum
Database

About

Regulatory framework >

Protected Zones

Contacts

Welcome to the ICASA Reference Geo-location Spectrum Database (R-GLSD)

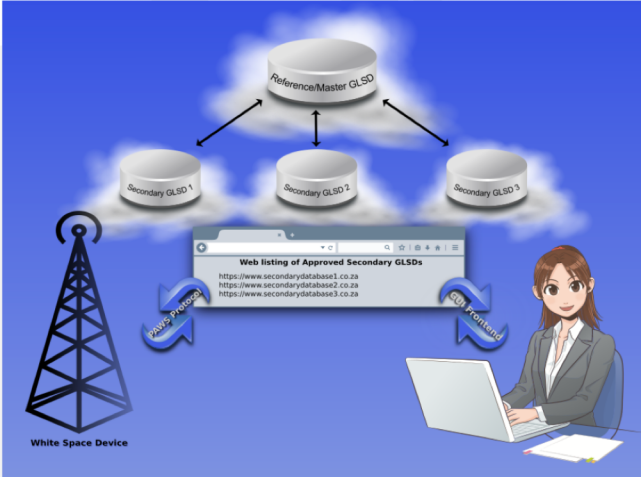
Radio frequency (RF) spectrum is an important and scarce resource for the national Information and Communications and Technology (ICT) infrastructure. Efficient utilization of RF spectrum is crucial for providing affordable wireless broadband connectivity for unserved and underserved communities as well as for the public safety services.

The exponential growth of mobile and fixed-nomadic applications for Human-to human (H2M) and Internet of Things (IoT) communications has prompted further investments in network capacity resulting in the ever-increasing demand for RF spectra. This has also shown a need for reforms on existing spectrum management approaches, in particular, by formulating new dynamic and flexible frameworks and also promoting new spectrum sharing technique.

On April 2017, the Authority published a position paper on a "Framework for Dynamic and Opportunistic Spectrum Management". Subsequently, on March 2018, the Authority published the "Regulations on the use of Television White Spaces 2018". Television White Spaces (TVWS) refers to the dynamic sharing of un-used spectrum portions in the television band without causing harmful interference to the incumbent users of the band. The South African TVWS regulatory framework allows broadcast spectrum band: 470 MHz to 694 MHz (excluding the Radio Astronomy sub band: 606 MHz to 614 MHz), to be shared on a secondary basis by White Space Devices (WSDs) for providing broadband services.

The Regulations prescribe that all operations of WSD networks will be controlled by certified Secondary Geo-location Spectrum Database (S-GLSD) providers.

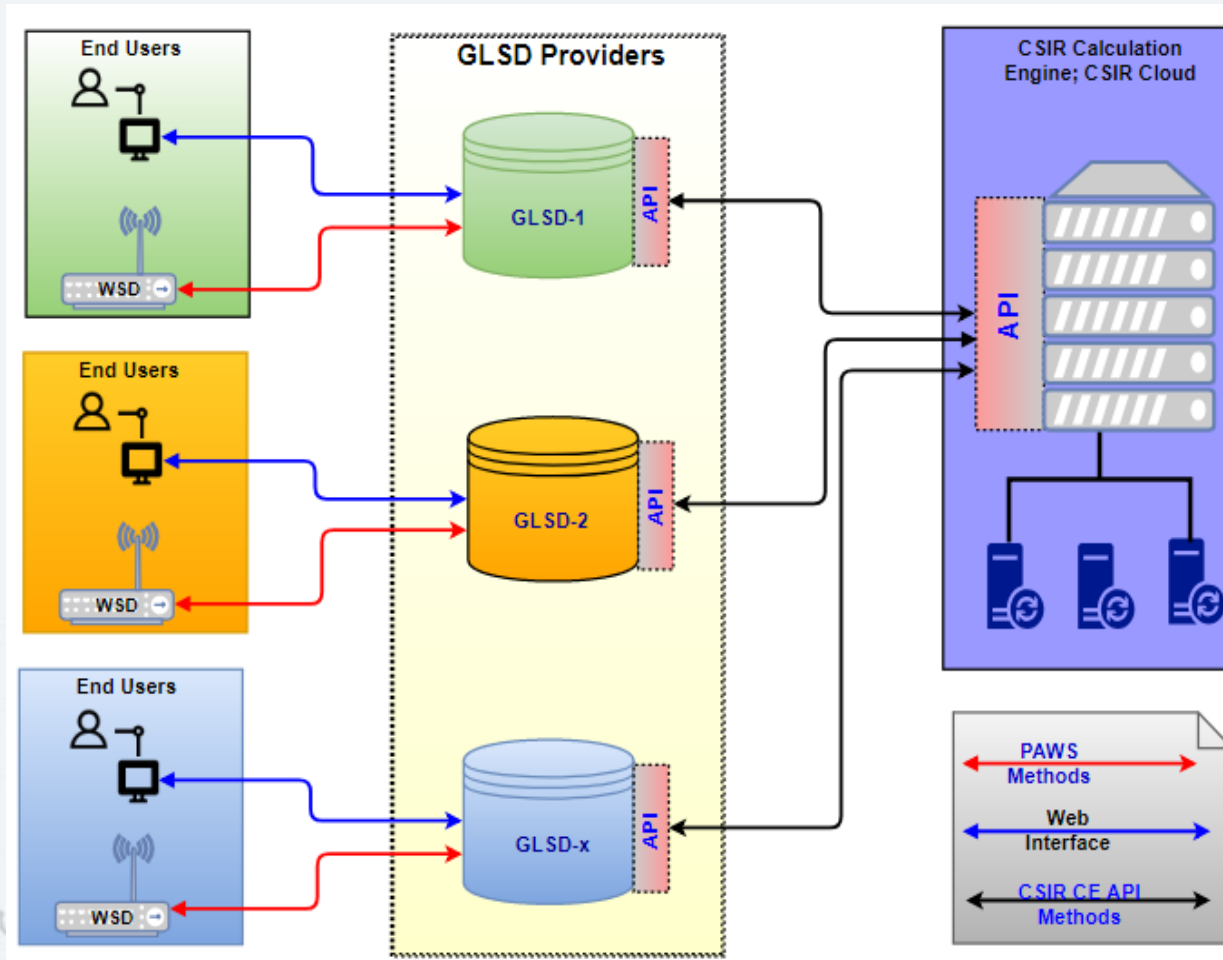
Ultimately, the Authority will therefore monitor the activities of S-GLSD providers and enforce compliance to the Regulations through a Reference Geo-location Database (R-GLSD). As such this is an important tool for enabling the Authority to implement the TVWS regulatory framework in the country.



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CSIR's TVWS GLSD – A key enabler



CSIR's GLSD is used in South Africa and has been exported to several countries:

- Botswana
- Cyprus (by invitation)
- Ethiopia
- Ghana
- Tanzania
- United Kingdom (Certified by OFCOM)

Another Policy Enabler (National Radio Frequency Plan 2018)

- Published 25 May 2018
- Section 34 (2) – “Minister must approve NRFP developed by the Authority ... “
- Section 34 (5) – “... When updating and amending this plan due regard must be given to the current and future usage of the radio frequency spectrum”



Typical application for 470-694MHz lists Broadcasting, Radio Astronomy (606-614MHz) and SAP/SAB applications



Notes and Comments include “The use of TV white spaces is under consideration (subject to non-interference basis to users under primary allocation)”

Phase two of DSA in South Africa?

- Tiered spectrum sharing model (TSSM) in IMT bands
- Unlicensed 6GHz, including standard-power access points, under AFC control



Thank You!