

**COMSOL NETWORKS (PTY) LTD COMMENTS ON
Second-Draft-National-Radio-Frequency-Plan-2025**

COMSOL NETWORKS (PTY) Ltd
(Registration Number 2001/018371/07)

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I. Company Information

☐☐☐ Name and Registration No.

Comsol Networks (Pty) Ltd with Registration Number 2001/018371/07, hereinafter referred to as "Responder".

☐☐☐ Principle place of business

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II. COMMENTS ON Second-Draft-National-Radio-Frequency-Plan-2025

This document has been prepared by Comsol Networks (Pty) Ltd ("Comsol"), for comment on GOVERNMENT GAZETTE, 7 November 2025, NOTICE 3585 OF 2025

Purpose

The intended purpose of this document is to:

Allow both TDD and FDD operation for Fixed Links in the 28 GHz band (27.5–29.5 GHz) for P-P and P-MP systems.



1 Company Overview

1.1 Background

Comsol Networks (Pty) Limited is a recognised market leader and specialises in building customised terrestrial wireless access infrastructure for companies, government entities and parastatals of all sizes, across all sectors. This infrastructure can be used for any connectivity purpose, ranging from short distances between locations that are a few meters apart, to distances of a few thousand kilometers between provinces, and even between countries.

Wireless infrastructure can either be used as a standalone solution or to complement other forms of connectivity infrastructure such as fibre, leased lines and other copper infrastructure. Since its inception in 1997 Comsol has installed more than 50,000 wireless connections across South Africa covering a distance in excess of 360,000 kilometers.

Comsol Networks (Pty) Ltd, has several licenses, including an Individual Electronic Communication Network Services (IECNS) Licence, Individual Electronic Communication Services (IECS) Licence and various spectrum licenses from ICASA. Comsol also has access to more than 1,300 high-sites around the country. This allows for quick deployment of wireless solutions, within a matter of days if required.

1.2 Location and National Presence

Comsol has a staff complement of 190 personnel, with its head office and main branch in Midrand, Gauteng, and branch operations in Cape Town, Port Elizabeth, East London and Durban. It also has technical teams in Welkom, East London, Polokwane and Mbombela.

Sixty percent of the company's workforce is made up of highly skilled technicians located across the country who build, implement, and maintain wireless connectivity solutions for customers. These technicians are all certified in the solutions they are providing, and are permanently employed. Comsol also often make use of well-trained contractors to assist in the rollout of its network.

Comsol has a direct technical presence in seven provinces across South Africa, through which it provides services to customers and other parts of Africa. This enables it to offer specific service level agreements to suit customer requirements and budgets.

1.1 Strategic Partnerships

Comsol has strategic partnerships with various major Telecommunication Service Providers to deploy and manage their respective last-mile wireless solutions resulting in the provision of wireless connections for thousands of customers, including:

⌘ Citi Bank	⌘ T-Systems	⌘ BP	⌘ CSIR
⌘ Rand Merchant Bank	⌘ Dimension Data	⌘ Petro SA	⌘ SARS
⌘ Investec	⌘ Internet Solutions	⌘ MacSteel	⌘ Eskom



⌘ FNB	⌘ Vodacom EBU	⌘ Harmony Gold	⌘ Super Group
⌘ Nedbank	⌘ Seacom	⌘ Exxaro	⌘ Life Healthcare
⌘ ABSA	⌘ Fibreco	⌘ De Beers	⌘ Bidvest
⌘ Deloitte	⌘ Telkom		⌘ UTI

Comsol also provide services to multiple metropolitan councils in KwaZulu-Natal and the Eastern Cape and various municipalities across South Africa and is the preferred wireless solution provider for the Tertiary Education Research Network (TENET), which involves linking tertiary institutions to TENET's fibre backbone.

1.3 Ownership and Empowerment Status

Comsol is majority owned by black empowerment group Convergence Partners, with the balance of the equity held by executive management.

The company has a Level Three BBBEE rating, which comes from a mix of equity holding, procurement policies, enterprise development and corporate social investment projects.



2 Regulatory and standards basis

The Second Draft National Radio Frequency Plan 2025 (“NRFP-2025”) already designates the 27.5–29.5 GHz range as **“Fixed Links (28 GHz) (27.5–29.5 GHz)”** under the fixed service, and explicitly links the channelling plan for this band to **ITU-R Recommendation F.748, Annex 2**.

Recommendation ITU-R F.748-4 defines radio-frequency arrangements for fixed service systems in the **27.5–29.5 GHz band**, including digital systems, with channel separations from 2.5 MHz up to 112 MHz, applicable to both point-to-point (P-P) and point-to-multipoint (P-MP) deployments and to fixed wireless access.

In Annex 1 and Annex 2, ITU-R F.748-4 shows examples of homogeneous channel patterns for 27.5–29.5 GHz, and explicitly notes that these arrangements “may be used in digital systems for P-P and/or P-MP applications”.

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In Annex 3, where block-based arrangements are defined, the **usage notes** are very clear: block arrangements are for both P-P and P-MP systems, frequency blocks are paired to facilitate FDD, and **TDD systems may operate in either the lower or upper frequency blocks**.

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Although Annex 3 examples are given for 24.25–26.98 GHz, NRFP-2025 already imports the same Recommendation and homogeneous pattern principles into the 28 GHz fixed links allocation, so the duplex-agnostic intent of F.748-4 is directly relevant.

Therefore, allowing both **TDD and FDD** operation for fixed links in 27.5–29.5 GHz is fully aligned with the referenced ITU-R standard that NRFP-2025 has already chosen as its channelling basis.

3 Consistency with existing policy in adjacent bands

In the **24.5–26.5 GHz** range, NRFP-2025 designates “Fixed Links (26 GHz) (24.5–26.5 GHz)” with a channelling plan in accordance with **ITU-R F.748 Annex 1**, and notes **FWA and IMT TDD (24.25–27.5 GHz)** as typical applications.

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This means that in the **same overall 24.25–27.5 GHz millimetre-wave range**, South Africa already explicitly recognises **TDD operation** (for IMT and FWA) while at the same time relying on F.748 channel plans for fixed links. Extending the same technology-neutral approach to the 27.5–29.5 GHz “28 GHz” fixed links band is a natural and internally consistent step:

- It keeps the policy **harmonised across 24.25–29.5 GHz**, rather than treating 28 GHz differently without a technical basis.



- It respects the **technology-neutral principle**, letting licensees choose FDD or TDD according to network design, as long as they remain inside the agreed channel/block masks and power limits.

4 Technical rationale and spectrum-efficiency benefits

4.1 Support for both symmetric and asymmetric traffic

P-P and P-MP fixed systems in 28 GHz will serve diverse roles: backhaul for mobile and FWA sites, enterprise and campus connectivity, and high-capacity aggregation links. Traffic patterns on these links are often **asymmetric** (for example, downstream-heavy internet access or upstream-heavy enterprise upload windows).

- **FDD** is efficient for highly symmetric, constant-bit-rate traffic and is well supported by existing microwave equipment.
- **TDD** allows operators to **dynamically adjust the downlink/uplink ratio** over time, matching the actual traffic asymmetry and thereby improving spectrum efficiency in a given channel or block.

Allowing both duplexing modes thus enables better **spectral efficiency** in the fixed service without requiring any additional spectrum.

4.2 Alignment with modern equipment capabilities

The worldwide ecosystem in the 24–29.5 GHz range now includes many platforms that can operate in **either TDD or FDD** modes, depending on licensing and configuration. ITU-R F.748-4 already anticipates “several types of service with various capacities... in simultaneous use in these frequency bands” and emphasises block allocation to allow **flexible deployment of various technologies**.

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By explicitly permitting both TDD and FDD for fixed links in the 28 GHz band, the national framework:

- Opens up a **wider range of vendor solutions** and promotes competition.
- Reduces costs by allowing use of **globally standardised radio platforms**.
- Future-proofs the band for evolving fixed service technologies.



5 Coexistence with FSS, ESIMs and HDFSS

The NRFP-2025 text for 27.5–29.5 GHz recognises significant satellite usage: fixed-satellite uplinks, ESIMs (GSO and NGSO), BSS feeder links, and high-density FSS (HDFSS) in parts of the band, all under the associated ITU footnotes and Resolutions 143, 169, 123 and 679.

Enabling TDD in addition to FDD for fixed links does **not** change the fundamental sharing environment with satellite services, provided that:

- Fixed service systems respect the same **maximum EIRP, out-of-block and out-of-band emission masks** as FDD systems.
- The channel arrangement remains based on **F.748-4 Annex 2** (as already referenced), so the same homogeneous pattern and guard bands apply.
- The planned **RFSAP for 27.5–31 GHz**—already envisaged in NRFP-2025—can define any additional coordination or geographic separation rules needed for protection of FSS and ESIM operations, irrespective of duplexing mode.

In fact, in the block-based examples in Annex 3 of F.748-4, ITU explicitly allows TDD operation in either lower or upper blocks while still assuming coexistence with other services, confirming that duplex mode is not the primary determinant of compatibility; the **emission envelope and coordination** are.

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6 Support for both P-P and P-MP fixed networks

Both NRFP-2025 and ITU-R F.748-4 envisage use of these bands for **point-to-point and point-to-multipoint** systems, including fixed wireless access.

- P-P high-capacity backhaul links may continue using FDD or, where beneficial, TDD (for example when aggregation links are strongly asymmetric).
- P-MP and FWA architectures—especially those with sectorised hubs and many terminals—can make very efficient use of **TDD frame structures** while still coexisting with neighbouring FDD links, as long as the RFSAP codifies appropriate coordination measures.

Allowing both duplex modes therefore enhances flexibility to design **cost-effective FWA and aggregation networks** within the same 28 GHz fixed link allocation.



7 Proposed clarification in NRFP-2025

To make this intent explicit while remaining aligned with ITU-R F.748-4 and the existing 28 GHz allocation text, the following clarification could be added in the “Typical Applications / Notes and Comments” column for the **27.5–29.5 GHz Fixed Links (28 GHz)** entry:

“Fixed service systems in the band 27.5–29.5 GHz (‘28 GHz Fixed Links’) shall use channelling plans based on ITU-R Recommendation F.748, Annex 2 (latest version). Fixed links may employ **either frequency division duplex (FDD) or time division duplex (TDD)** operation, in **point-to-point and point-to-multipoint** configurations, subject to the national Radio Frequency Spectrum Assignment Plan (RFSAP) and coordination requirements with co-primary fixed-satellite and other services.”

This wording:

- Keeps the **primary reference** to ITU-R F.748-4 unchanged.
- Explicitly recognises both **TDD and FDD** as permitted duplexing modes.
- Confirms applicability to **P-P and P-MP** fixed links.
- Defers protection details to the forthcoming **RFSAP for 27.5–31 GHz**, ensuring that satellite and other co-primary services remain adequately protected.

8 Summary

Permitting TDD as well as FDD for fixed links in the 27.5–29.5 GHz band is strongly supported by the ITU-R framework already adopted in NRFP-2025, is consistent with South Africa’s treatment of adjacent millimetre-wave bands, and delivers clear spectrum-efficiency, technology-neutrality and cost benefits, without compromising the ability to protect fixed-satellite and other services through the planned RFSAP.

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