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on the

Spectrum Plan for the Accommodation of Private Wireless Networks

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Abbreviations

2G	second generation
3G	third generation
3GPP	3rd Generation Partnership Project
4G	fourth generation
5G	fifth generation
5G NR	fifth generation New Radio
APT	Asia-Pacific Telecommunity
AWS	advanced wireless services
BPSK	binary phase-shift keying
BWA	broadband wireless access
CATV	community antenna television
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
FDD	frequency division duplexing
FDMA	frequency division multiple access
FSS	fixed satellite service
FWA	fixed wireless access
GHz	gigahertz
GNSS	Global Navigation Satellite System
GSM	Global System for Mobile Communications
HAAT	height above average terrain
IoT	Internet of things
IMT	International Mobile Telecommunications
IMT-2000	International Mobile Telecommunications-2000
ISDN	integrated services digital network
ITU	International Telecommunication Union
ITU-R	International Telecommunication Union Radiocommunications
kHz	kilohertz
LAN	local area network
MFBI	multi-frequency band indicator
MHz	megahertz
MMDS	multichannel multipoint distribution system(s)
MSS	mobile-satellite service
MVDS	multipoint video distribution system(s)
MWA	mobile wireless access
MWS	multimedia wireless system(s)

NOS	network operating system
NPN	non-public network
NSP	National Spectrum Plan
NWA	nomadic wireless access
PCS	personal communications service(es)
PLMN	public land mobile network
PMTS	public mobile telecommunications services
PPDR	public protection and disaster relief
PRB	physical resource block
PSDN	public switched data network
PSTN	public switched telephone network
QPSK	quadrature-phase shift keying
QAM	quadrature amplitude modulation
RAN	radio access network
SCADA	supervisory control and data acquisition
SCS	subcarrier spacing
STL	studio-to-transmitter link
TATT	Telecommunications Authority of Trinidad and Tobago
TRP	total radiated power
TSL	transmitter-to-studio link
TTL	transmitter-to-transmitter link
TDD	time division duplexing
UMTS	Universal Mobile Telecommunications System
WAN	wide area network
WCDMA	Wideband Code Division Multiple Access
WRC-07	World Radiocommunication Conference 2007
WRC-15	World Radiocommunication Conference 2015
WRC-23	World Radiocommunication Conference 2023

Terms and Definitions

The following terms and definitions are relevant to this *Spectrum Plan for the Accommodation of Private Wireless Networks.*

Block, frequency block, spectrum block: A contiguous portion of spectrum within a sub-band or frequency band, typically assigned to a single operator.
NOTE 1 – A collection of frequency blocks may form a sub-band and/or a frequency band.

Broadband wireless access: Wireless access in which the connection(s) capabilities are higher than the primary rate.

Broadband wireless access service: A service that accommodates the provision of broadband wireless access.

Channel; radio-frequency channel: A specified portion of the radio frequency (RF) spectrum which carries a specific radio signal.
NOTE 1 – A frequency channel includes one or more transmission channels.
NOTE 2 – A channel is composed of one or more slots. A collection of channels is a frequency block and/or a sub-band.

Closed user group network: A telecommunications network used to provide a closed user group service.

Customer premises equipment/network: The equipment/network administered by the user.
NOTE 1 – Based on ITU-T Recommendation H.310.

Downlink channel: A unidirectional transmission channel from central station to terminal station. Also referred to as downstream.

Downstream: The direction from base station to subscriber station(s).

Equivalent isotropically radiated power (EIRP): The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain) (ITU-R 2020).

Effective radiated power (ERP) (in a given direction): The product of the power supplied to the antenna and its gain relative to a half-wave dipole in a given direction (ITU-R 2020).

Fixed wireless access: Wireless access application in which the location of the end-user termination and the network access point to be connected to the end user are fixed.

Frequency division duplex: Separation of upstream and downstream transmission in the frequency domain at the same time.

Frequency plan; frequency arrangement: A systematic division of a frequency band into a collection of sub-bands, blocks and/or channels that are applicable to a radiocommunication service or services using the frequency band.

Harmful interference: Interference that endangers the functioning of telecommunications so as to impede, degrade, obstruct or interrupt a telecommunications service (the Telecommunications Act, Chap. 47:31 (the Act)).

Mobile wireless access: Wireless access application in which the location of the end-user termination is mobile.

Multimedia wireless system (MWS): A wireless system which supports information exchange of more than one type, such as text, graphics, voice, sound, image, data and video.

Nomadic wireless access: Wireless access application in which the location of the end-user termination may be in different places, but it must be stationary while in use.

Point-to-multipoint system: A system that establishes connections between a single specified point and more than one other specified point.
NOTE 1 – It should be noted that wireless access systems commonly feature air-side concentration in order to preserve valuable spectrum resources, although not necessarily so (as, for example, in some lower density, rural systems). Generally, point-to-multipoint systems offer fixed wireless access (FWA), hence the use of the term "fixed wireless access" defined above to distinguish such point-to-multipoint systems from mobile or nomadic wireless access systems.

Primary service: A radiocommunications service for which stations can claim protection from harmful interference from stations of a secondary service (ITU-R 2020).

Private telecommunications network: A telecommunications network used to provide a private telecommunications service.

Private telecommunications service: A telecommunications service used within one enterprise or its affiliates, to satisfy its or their internal needs and operated without any interconnection to a public telecommunications network (the Act).

Public telecommunications network: A telecommunications network used to provide a public telecommunications service (the Act).

Public telecommunications service: A telecommunications service, including a public telephone service, offered to members of the general public, whereby one user can communicate with any other user in real time, regardless of the technology used to provide such service (the Act).

Secondary service: A radiocommunications service through which stations shall not cause harmful interference to stations of primary services and cannot claim protection from interference from stations of primary services (ITU-R 2020).

Station: One or more transmitters or receivers or a combination of transmitters and receivers, including accessory equipment, necessary at one location for carrying on a radiocommunications service or radio astronomy service (ITU-R 2020).

Time division duplex: Separation of upstream and downstream transmission in the time domain using the same frequency.

Uplink channel: A unidirectional transmission channel from terminal station to central station. Also referred to as upstream or upstream channel.

Upstream: The direction from subscriber station(s) to base station.

User: Any entity external to the network which utilises connections through the network for communication. (See ITU-T Recommendation E.600.)

Wireless access: End-user radio connection(s) to core networks.
NOTE 1 – Core networks include, for example, PSTN, ISDN, PLMN, PSDN, Internet, WAN/LAN and CATV.

NOTE 2 – The end user may be a single user or a user accessing the services on behalf of multiple users.

1 Introduction

1.1 Background

The Telecommunications Authority of Trinidad and Tobago (the Authority) is mandated by the Telecommunications Act, Chap. 47:31 (the Act), under section 41(1) to:

> regulate the use of the spectrum in order to promote the economic and orderly utilisation of frequencies for the operation of all means of telecommunications and to recover the cost incurred in the management of the spectrum.

There is growing domestic and regional demand for spectrum to deploy private wireless networks. A private network, or non-public network (NPN), is defined by the International Telecommunication Union (ITU) as a network designed for non-public use. In this *Spectrum Plan for the Accommodation of Private Wireless Networks* (the Plan), "private wireless networks" refers to NPNs deployed by entities within specific, limited geographic areas, such as factories, ports, energy sites and campuses where public Wi-Fi or mobile connectivity may be sporadic, insufficiently secure or unreliable. These networks are owned and operated by closed user groups and can provide services like those of a public wireless network, while giving enterprises greater control over coverage, security, latency and device density.

Private wireless networks may operate using either class-licensed spectrum or individually licensed spectrum, depending on the relevant band, service type and interference-protection requirements. A fixed private wireless network provides secure, managed connectivity for stationary and mobile assets, without relying on public networks, with stronger interference protection where licensed spectrum is used. Private mobile networks, often referred to as private fourth generation Long Term Evolution (4G LTE) and fifth generation (5G) networks, allow connected devices such as vehicles, robots and handheld devices to move seamlessly within a defined coverage area and are used to support operational mobility.

The introduction of 5G has expanded the use of mobile networks into vertical markets by enabling a range of innovative applications for industrial automation, enterprise-controlled networks, utilities, smart buildings, mining, logistics and supply-chain management, including operations at airports and ports. These use cases may be well suited to NPNs because each deployment can be customised to satisfy enterprise-specific integration requirements, such as low latency, high reliability, high availability, high bandwidth and security, while taking account of relevant economic considerations.

Spectrum liberalisation efforts are being undertaken globally by regulators in all three ITU Regions, to accommodate the deployment of private wireless networks. While the Authority has historically focused on spectrum for public mobile telecommunications services (PMTS), growing interest in private networks has led to the development of the *Framework for the Authorisation of Standalone Ancillary Terrestrial Component (ATC) Systems (V.1.0)*, which identifies spectrum for the authorisation of standalone ATC systems in Trinidad and Tobago within the 2.4 GHz (2483.5–2500 MHz) mobile satellite service (MSS) band, to enhance wireless connectivity in support of private small-cell and enterprise networks.

In alignment with the principles of the *Spectrum Management Framework (V.2.0)*, including the allocation of spectrum to its highest-value use and the facilitation of spectrum movement to higher-value uses, the Authority will make spectrum available in low-, mid-, and high-frequency bands for the deployment of private wireless networks in Trinidad and Tobago.

1.2 Purpose

This Plan identifies spectrum bands, assignment principles, licensing approaches and technical operating conditions to support the deployment of private fixed and mobile wireless networks in Trinidad and Tobago. It responds to growing demand from enterprise, industrial, energy, logistics, public safety and campus users for secure, reliable, low-latency wireless connectivity, while preserving orderly spectrum management and protecting incumbent services. The Plan proposes low-, mid-, and high-band spectrum options, sets out relevant licensing conditions, and establishes technical parameters to guide implementation and stakeholder consultation.

1.3 Objectives

The Plan:

1. reviews and considers the global environment, including market and sector interests.
2. identifies the frequency ranges, assignment plans and spectrum caps that will be allocated for the provision of private networks;
3. outlines the licensing process for the assignment of frequency ranges, including any specific licensing conditions.
4. defines the technical operating conditions and specifications to be imposed on the licensed radiocommunications systems in the allocated frequency ranges.

1.4 Scope

The Plan is a subset of the *National Spectrum Plan (V.1.0)*, which serves as the instrument for regulating the use of spectrum in an orderly and efficient manner, in keeping with the Authority's mandate under the Act. As a Plan, it specifies how suitable spectrum will be allocated for private wireless networks under existing legislation and procedures.

This Plan accommodates the assignment of licensed spectrum for the provision of private fixed and mobile wireless networks. It refers to spectrum that is allocated specifically to non-telecom operators (e.g., enterprises) to deploy private wireless networks for closed user group services.

The Plan specifies the spectrum bands that have been allocated by the Authority, the allotment of channels within those bands and how they will be licensed. The bands contained in this Plan can accommodate the deployment of International Mobile Technologies (IMT) for private wireless fixed and mobile services.

The Plan does not address the allocation and licensing of spectrum bands for PMTS, public broadband wireless access (BWA) services, satellite services, land mobile radiocommunications systems, public protection and disaster relief (PPDR) or emergency services. The Plan also does not address class-licensed spectrum bands[1] that may be used for the deployment of private networks, as this is addressed in the *Spectrum Plan for the Accommodation of Broadband Wireless Access V.1.0*.

1.5 Relevant Legislation

The following sections of the Act inform this Plan:

Section (18) (1)(i):

> Subject to the provisions of this Act, the Authority may exercise such functions and powers as are imposed on it by this Act and in particular –
> Plan, supervise, regulate and manage the use of the radio frequency spectrum, including –
>
> 1. the licensing and registration of radio frequencies and call signs to be used by all stations operating in Trinidad and Tobago or on any ship, aircraft, or other vessel or satellite registered in Trinidad and Tobago;

[1] Class-licensed spectrum bands for private networks are addressed in the *Spectrum Plan for the Accommodation of Broadband Wireless Access V.1.0.*

2. the allocation, assignment and reallocation or reassignment of frequency bands where necessary.

Section 21 (1):

No person shall operate a public telecommunications network, provide a public telecommunications service or broadcasting service, without a concession granted by the Minister.

Section 36 (1):

No person shall –

1. establish, operate or use a radio-communication service;

2. install, operate or use any radio transmitting equipment; or

3. establish, operate or use any radio-communication service on board any ship, aircraft, or other vessels in the territorial waters or territorial airspace of Trinidad and Tobago, other than a ship of war or a military aircraft or satellite registered in Trinidad and Tobago without a licence granted by the Authority.

Section 41 (1):

The Authority shall regulate the use of the spectrum in order to promote the economic and orderly utilisation of frequencies for the operation of all means of telecommunications and to recover the cost incurred in the management of the spectrum.

Section 41 (2):

The Authority shall develop a spectrum plan in order to regulate the use of the spectrum.

Section 41 (3):

The *National Spectrum Plan* shall be made available to the public in the manner prescribed by the Authority.

Section 41 (4):

> The *National Spectrum Plan* shall state how the spectrum shall be used and the procedures for licensing frequency bands.

1.6 Other Relevant Documents

Other relevant policies, plans and regulations developed by the Authority that should be read with this Plan include:

1. *Class Licensing Regime (V.1.0)*
2. *Framework for Authorisation of Standalone Ancillary Terrestrial Component Systems (V.1.0)*
3. *Framework for Fifth Generation (5G) Public Mobile Telecommunications Networks (V.1.0)*
4. *National Spectrum Plan (V.1.0)*
5. *Schedule B – Schedule of Devices Eligible for Use under a Class Licence (TATT, 2026)*
6. *Spectrum Plan for the Accommodation of Broadband Wireless Access*[2] *(V.2.0)*
7. *Spectrum Plan for the Accommodation of Land Mobile Radiocommunications Systems (V.1.0)*
8. *Spectrum Plan for the Accommodation of Public Mobile Telecommunications Services (V.5.0)*
9. *Spectrum Management Framework (V.2.0)*
10. *Technical Standards for Wireless Networks (V.1.0)*
11. *The Trinidad and Tobago Frequency Allocation Table (V. 4.0)*

The above-listed documents are accessible on the Authority's website, www.tatt.org.tt.

[2] The *Spectrum Plan for the Accommodation of Broadband Wireless Access V.2.* was available at the time of this publication and the version is subject to change upon publication of the revised version. Please refer to the latest version published.

1.7 Review Cycle

This Plan is scheduled for review every four years to align with relevant outcomes of ITU World Radiocommunication Conferences (WRCs) and other international best practices, including technological advancements and pertinent regional allocations.

Based on the Authority's discretion, this Plan may also be reviewed at any time to accommodate domestic requirements or to address proposals for immediate modification submitted by stakeholders or members of the public. Upon review, the Authority will make justifiable modifications, in consultation with stakeholders, to ensure the Plan is guided by appropriate policy guidelines and objectives.

Questions or concerns regarding the maintenance of the Plan may be directed to the Authority via email at consultation@tatt.org.tt.

1.8 Consultation Process

In accordance with its *Procedures for Consultation in the Telecommunications and Broadcasting Sectors of Trinidad and Tobago (V.7.0)*, the Authority will seek the views of stakeholders and the public on this Plan.

This document will undergo two rounds of consultation, which shall each be at least six weeks in duration. Consideration will be given to the comments and recommendations received from each round of consultation, and the document may be revised accordingly.

2 Considerations for the Accommodation of Private Wireless Networks

2.1 The Global Environment

Private wireless network deployments are expanding rapidly worldwide, driving increased demand for dedicated spectrum. Across ITU Region 2 (comprising countries in North America, Latin America and the Caribbean), regulatory bodies are shifting focus beyond public mobile services to support industrial digitisation across sectors like logistics, energy and tourism. To facilitate this, administrations are adopting shared, lightly licensed or direct allocation frameworks to make spectrum accessible and affordable for enterprise use.

In the United States, the Federal Communications Commission (FCC) pioneered flexible access through the Citizens Broadband Radio Service (CBRS) – a three-tiered, dynamic sharing model managed by automated spectrum access systems (SAS). Tier 3 (General Authorised Access) allows free, non-exclusive access, while Tier 2 provides protected use via Priority Access Licences. The FCC has also restructured the 900 MHz band for critical infrastructure, allowing entities like Anterix[3] to lease spectrum to utilities for smart grid, and enabling localised access in high-frequency millimetre-wave (mmWave) bands (e.g., 28 GHz and 39 GHz) for high-bandwidth industrial automation. Additionally, operators like Globalstar offer dedicated terrestrial bands, such as band 53/n53 (2.4 GHz), for localised enterprise deployments.

Other Region 2 administrations are implementing similar agile frameworks:

Canada: Innovation, Science and Economic Development Canada (ISED) recently introduced the non-competitive local licensing (NCLL) framework, assigning localised spectrum on a first-come, first-served basis rather than via high-cost auctions.

Latin America and the Caribbean: Brazil leads with its flexible private limited service (SLP) licences across sub-1 GHz, mid-band (3.7–3.8 GHz), and mmWave frequencies. Chile has long leveraged private networks for its mining sector, while Argentina, Belize, Colombia and Mexico are actively developing Industry 4.0 spectrum plans. Colombia's Agencia Nacional del Espectro (ANE), for instance, proposed dedicated portions of the 410 MHz, 900 MHz, 3.5 GHz and 26 GHz bands, to prevent conflicts with commercial carriers. Caribbean markets typically utilise direct licensing or spectrum leasing arrangements.

[3] Anterix is a company focused on delivering transformative private broadband for enabling the modernisation of critical infrastructure and is the largest holder of licensed spectrum in the 900 MHz band throughout the contiguous United States, Hawaii, Alaska and Puerto Rico (source SNS Telecom & IT, 2026)

Across these markets, enterprises generally balance two allocation paths: shared or lightly licensed models that minimise entry costs or spectrum leasing from mobile network operators (MNOs) to guarantee exclusive, interference-free access. Table 1 outlines the primary private network spectrum bands across ITU Region 2 administrations.

Table 1. Private network spectrum bands used by ITU R 2 administrations

ITU R2 Administration	Primary Private Bands	Notes
USA	3.5 GHz (3.55–3.7 GHz) 900 MHz	**CBRS (Band 48):** A tiered, shared access model managed by automated systems. **900 MHz (Band 106):** Favoured for low-band private LTE, especially for utility and smart grid applications.
Canada	3.9 GHz (3.9–3.98 GHz), 26 GHz, 28 GHz	**NCLL:** For localised industry use.
Brazil	2.4 GHz, 2.3-2.4 GHz, 3.7–3.8 GHz, 28 GHz	**SLP licences:** Allow private entities to request local authorisation for limited areas.
Chile	3.75–3.8 GHz, 2.6 GHz	First in Latin America (LATAM) to allocate specific industrial 5G bands; 2.6 GHz is widely used for mining.
Argentina	2.3–2.4 GHz	Recently opened for **Private Wireless Broadband Systems (SPIBA)** [4] licences to support Industry 4.0.

[4] Resolution 1111/2025 – ENACOM (O.G. 08/25/2025): approves technical requirements/procedures related to Private Wireless Broadband Systems (SPIBA).

ITU R2 Administration	Primary Private Bands	Notes
Colombia	3.5 GHz (Trials)	Opened for trials in 2022 to support industrial 5G networks.
Mexico	3.3–3.4 GHz	Identified for IMT implementation, which supports private 5G deployments.

Private networks support industrial operations by improving reliability, scalability and operational control. IMT-2020 networks are increasingly used for private deployments because they can support public safety, manufacturing, critical infrastructure, robotics, remote monitoring and data-intensive operational applications. These networks may be implemented as physical or virtual private networks for use by governments or enterprises. Demand is being driven by requirements for data security, digitisation, operational mobility and improved productivity.

In 2025, GSA reported that the private mobile network market is expanding, with the manufacturing sector leading in deployments, followed by education, mining and defence. The United States has the highest adoption, with LTE prevalent and 5G growing. Spectrum availability is key for future growth.

Administrations worldwide are identifying localised spectrum frequencies for mobile and fixed broadband private networks, commonly referred to as private LTE or private 5G. These approaches allow smaller operators and enterprise users to access licensed spectrum affordably, rather than relying solely on national auctions. The trend responds to rising demand for private 4G and 5G networks across industry sectors and supports competition and innovation in broadband services. Accordingly, regulators are making spectrum available for broadband and private networks through dedicated licences for specific frequency bands and revisions to spectrum plans that support efficient resource allocation.

Private networks are being deployed across a wide range of configurations, from localised corporate network zones to rapidly deployable network-in-a-box solutions, as shown in Table 2.

Table 2. Private network applications used by vertical industries

(Source: Cullen International)

Vertical Industry	Primary Applications and Engagements
Manufacturing	Implemented globally by brands like BMW, Ford, Tesla and Schneider Electric for Industry 4.0 applications in factories, automotive plants and steel mills.
Oil, Gas & Mining	Used by giants like Aramco, BHP, Rio Tinto and Shell for surface/underground communications, remote Internet of Things (IoT) asset tracking via satellite and teleoperation of autonomous machinery.
Ports & Logistics	Deployed at major shipping hubs (e.g., APM Terminals and Hutchison Ports) to connect automated guided vehicles (AGVs), remote-controlled cranes and smart cargo systems.
Aviation & Rail	Implemented at major international airports (e.g., Heathrow, JFK and O'Hare) and rail systems, to power ground operations, aircraft maintenance diagnostics and train-to-ground communications.
Public Safety & Military	National mission-critical platforms (e.g., FirstNet and VIRVE 2.0) and global militaries utilise dedicated slices and portable networks for tactical-edge communications and disaster zones.
Utilities	Utilised via sub-1 GHz bands for wide-area smart grid automation, as well as localised networks inside power plants and offshore wind farms.
Healthcare & Education	Hospitals use dedicated 5G campus networks for smart medical applications. Universities deploy them for experimental research, while school districts use CBRS networks to bridge the digital divide for remote learning.
Agriculture & Forestry	Powering autonomous tractors and artificial intelligence (AI) analytics in agriculture (e.g., Wagyu beef breeding in Japan) and remote timber mills or electric harvesting drones in forestry.
Broadcasting & Warehousing	Media companies (e.g., BBC, CNN and FOX Sports) use temporary setups for live TV production. Retail/logistics giants (such as Amazon and Walmart) utilise them for smart warehousing.

2.2 National Considerations

The following national considerations explain why the Authority is proposing dedicated spectrum arrangements for private wireless networks in Trinidad and Tobago. They address domestic demand, spectrum availability, band suitability and the relationship between private-network assignments and existing public telecommunications services.

The Authority continues to foster the growth and development of telecommunications infrastructure in Trinidad and Tobago. This role supports the delivery of innovative and emerging radiocommunications services and helps ensure that society has access to appropriate digital technologies. In pursuing universal access, the Authority seeks to encourage the efficient and orderly transformation of the sector while promoting a digitally transformed culture and connected communities across Trinidad and Tobago.

In accordance with the Spectrum Management Framework *(V.2.0)*, this Plan establishes specific spectrum allocations and licensing methodologies to enable the deployment of private radiocommunications networks in Trinidad and Tobago.

Private LTE and 5G networks are technically and economically feasible for industrial, port and campus use cases in Trinidad and Tobago. The Inter-American Development Bank (IDB) highlights a persistent urban-rural digital divide in Trinidad and Tobago, driven by limited infrastructure investment in remote regions and reduced bandwidth for institutions located far from core networks. Energy, manufacturing and port facilities are critical economic drivers and require high-availability, low-latency and secure connectivity that public MNOs may not be able to guarantee in remote zones. These conditions create demand for enterprise-deployed private networks. In this context, spectrum availability is the central constraint addressed by this Plan, which identifies specific spectrum to enable Industry 4.0 in Trinidad and Tobago's energy and logistics sectors without compromising public mobile network services.

Demand for private network spectrum in Trinidad and Tobago is rising rapidly. In 2024, the Authority received numerous formal inquiries from multinational energy and industrial enterprises seeking to establish local private networks. Aligning with *Spectrum Management Framework* Policy Statement #21, which mandates making spectrum available to support emerging radiocommunications services within a streamlined licensing framework, the Authority evaluated:

1. International spectrum alignment and usage across ITU Region 2.

2. Specific band requests submitted by prospective private network operators.

3. Regional spectrum harmonisation to maximise equipment ecosystem availability.

4. In-country spectrum capacity and coexistence requirements.

5. Transparent and efficient assignment processes.

Spectrum band suitability is also an important consideration. Lower frequency ranges, including low bands below 2 GHz, generally provide stronger coverage, range and outdoor-to-indoor penetration but support more limited bandwidth and capacity. Higher frequency ranges generally provide greater capacity but weaker outdoor-to-indoor penetration. Mid-band spectrum, typically between 2 GHz and 6 GHz, offers a balance between coverage and capacity and is therefore suitable for a range of private network deployments.

In light of the above, the Authority proposes various frequency bands for the deployment of private networks in order to reduce potential barriers to wider adoption. In the upper 2.4 GHz band, licensed spectrum for low-power ATC services in the 2483.5–2495 MHz frequency range may be authorised for standalone, low-power ATC systems in Trinidad and Tobago for private or closed user group use. Such authorisation would be subject to the *Authority's Framework for the Authorisation of Standalone Ancillary Terrestrial Component (ATC) Systems* and would require sufficient separation between BWA operations and ATC services in adjacent spectrum.

Table 3 summarises the designated frequency bands, technical parameters and corresponding licensing frameworks for private network deployments.

Table 3. Frequency allocations for private networks

ITU-R Recommended Frequency Range of Operation	Trinidad and Tobago Frequency Allocation Table (TTFAT)	Current Spectrum Availability
The 900 MHz band (880–915/925–960 MHz)	The frequency ranges 880–915/925–960 MHz are allocated in the TTFAT to fixed and mobile as co-primary services, except for the frequency range 902–928 MHz, where mobile is allocated on a secondary basis and is also class licensed.	Within these ranges, 896–901/935–940 MHz (2 x 5 MHz) of spectrum is unassigned and available for assignment for private networks.

ITU-R Recommended Frequency Range of Operation	Trinidad and Tobago Frequency Allocation Table (TTFAT)	Current Spectrum Availability
The 1500 MHz band (1427–1470/1475–1518 MHz)	The frequency ranges 1427–1470/1475–1518 MHz span four frequency allocations in TTFAT: 1427–1429 MHz, 1429–1452 MHz, 1452–1492 MHz and 1492–1518 MHz. Fixed and mobile services are primary services in all the ranges except 1452–1492 MHz, where there is no allocation for fixed services.	Within these ranges, 1427–1437/1475–1485 MHz (2 x 10 MHz) of spectrum is available for assignment to private networks.
The 2.3 GHz band (2300–2450 MHz)	The frequency range 2300–2450 MHz is allocated in TTFAT to fixed, mobile and radiolocation services as co-primary services, and to amateur services as the secondary service. TT footnotes 29, 32, 39, 51 and 55 apply.	60 MHz of the lower portion of the 2.3 GHz band (2300–2360 MHz) is allocated to public fixed BWA services. The upper portion of the 2.3 GHz band (2340–2400 MHz) is proposed for assignment to private networks in Trinidad and Tobago.
The upper 2.4 GHz band (2483.5–2495 MHz)	The frequency range 2483.5–2495 MHz has been allocated for use by ATC systems on a primary basis.	11.5 MHz (2483.5–2495 MHz) of spectrum is available for the assignment to private networks in Trinidad and Tobago.
The 3.94–3.98 GHz band	The frequency range 3.7–4.2 GHz is allocated to fixed, fixed satellite and mobile on a primary basis. TT footnotes 33 and 62 apply.	In the upper 3.5 GHz band (3.7–4.2) GHz, no allocations were made to PMTS or public fixed BWA services, due to existing commercial television receive-only (TVRO) licensees using the C-band and international references on 5G and radio altimeters' coexistence. 40 MHz (3940–3980 MHz) of spectrum will be available for the assignment to BWA services for

ITU-R Recommended Frequency Range of Operation	Trinidad and Tobago Frequency Allocation Table (TTFAT)	Current Spectrum Availability
		private networks, in alignment with other administrations in Region 2.
The 26 GHz band (24.25–27.5 GHz)	In the TTFAT, the 24.25–27.5 GHz frequency band is identified across seven allocations, including co-primary fixed and mobile services.	The 24.25–27.5 GHz frequency range, 3GPP band n258, was identified for IMT at WRC-19 and is supported across all three ITU Regions. Although a portion of this range (25.35–28.35 GHz) is currently assigned to BWA services, TATT's 5G framework designates 24.25–27.5 GHz for IMT implementation. The Authority has reserved 850 MHz of spectrum (24.25–25.10 GHz) in the lower portion of band n258 for private, localized network assignments.

In its continuing effort to make additional spectrum available for private networks, and recognising the value of feedback from the industry, the Authority will consult with relevant stakeholders to assess any future candidate bands for private networks as demand and/or changes in the sector emerge.

3 Frequency Assignment Principles

The following principles apply to the frequency assignment plans for the accommodation of private networks in Trinidad and Tobago:

1. The adopted frequency assignment plan for a specified band shall follow the relevant ITU-R recommendation, where applicable, and take into consideration the predominant frequency assignment plan utilised for private networks in the particular frequency band.

2. Although the spectrum plan may identify the prominent radio technology deployed in a particular band, the Authority's technology-neutral approach allows licensees to choose their preferred technologies within allocated bands, provided that they conform to the stated frequency assignment plan and technical conditions and specifications. This approach fosters innovation and allows for the deployment of efficient technologies.

3. All frequency assignment plans shall have a reference channel bandwidth that serves as the minimum assignable channel bandwidth. All assignments to an operator shall be contiguous as far as possible.

4. Both time division duplexing (TDD) and frequency division duplexing (FDD) modes of operation will be supported, depending on the band in question. The frequency assignment plan for each band shall specify the applicable mode of operation in accordance with the pertinent technical conditions and specifications.

5. Frequency assignments shall be made in accordance with the selected licensing process, as established by the Authority.

6. Spectrum caps shall be instituted, where applicable, to limit the quantum of spectrum assigned to a user. The spectrum cap is the maximum quantum of spectrum that can be assigned to a user in a specified frequency band. The spectrum caps shall ensure that sufficient spectrum is available for assignment to operators in the bands allocated to private networks. Any revisions to the Plan, including to the spectrum caps, shall be in accordance with the Authority's *Procedures for Consultation in the Telecommunications and Broadcasting Sectors of Trinidad and Tobago* (TATT 2021).

7. A licensee shall utilise the spectrum assigned in a manner that does not cause harmful interference to any other licensee. The licensee shall also employ in-band guard bands to mitigate harmful interference.

8. The maximum RF output power limits may vary between different frequency bands, as propagation characteristics of the bands differ.

4 Frequency Assignment Plans for Private Networks

The various frequency bands allocated for the accommodation of private networks shall be subdivided into channel allotments to maximise efficient spectrum use. The following six subsections describe the frequency ranges under consideration and, for each band, set out the frequency assignment plan, recommended licensing process and conditions, and technical operating conditions and specifications for radiocommunications systems operating in that band.

Each band-specific subsection follows the same structure: selection of the frequency assignment plan, the proposed assignment plan, licensing process and conditions, and technical operating conditions. This structure is intended to allow stakeholders to compare bands consistently and to identify the regulatory, licensing and technical requirements that apply to each candidate band.

The actual availability of frequency channels for private networks will be determined, subject to a spectrum audit, prior to the implementation of the respective licensing process for the designated frequency bands.

4.1 The 900 MHz Band (896 -901/935 - 940 MHz)

4.1.1 Selection of the Frequency Assignment Plan

A segment of low-band spectrum in the 900 MHz band, namely, band/n106, has become an important option for secure private LTE and 5G networks used primarily for mission-critical applications in infrastructure and utility sectors. The band offers favourable propagation characteristics and can support coverage in industrial buildings, utility sites and other challenging environments. This enables organisations to deploy dedicated 4G and 5G networks with greater control over data privacy, security and operational resilience than may be available through public carrier networks.

Due to its low-band propagation characteristics, band 106 delivers superior coverage range and deep structural penetration into industrial facilities and underground infrastructure. This allows utilities and enterprise sectors to operate highly secure, customer-controlled 4G/5G networks independent of public MNO infrastructure.

The vendor ecosystem for band 106 continues to expand, with major equipment manufacturers, including Ericsson, Nokia, Motorola Solutions and Telit, supplying commercial radio access network (RAN) equipment, IoT modules and devices.

In the United States, the FCC previously allocated a 6 MHz broadband segment (897.5–900.5 MHz / 936.5–939.5 MHz) for utility operations. In 2026, the FCC expanded this framework to enable

broadband deployments across the full 10 MHz allocation (896–901 / 935–940 MHz). While 6 MHz provides a robust coverage layer for foundational SCADA and telemetry, transitioning to 10 MHz provides the additional physical resource blocks (PRBs) and capacity required for real-time control loops, robust encryption and high-density smart meter deployments.

In Canada, ISED utilises access licensing to assign 6 MHz as a baseline, with provisions for expansion in remote mining and agricultural areas, subject to inter-operator interference coordination. ISED is also allowing access licensing for 2 x 5 MHz of spectrum in band 8 / n8 (band 106 / n106) via site-specific radio licences. This framework is specifically designed to facilitate the deployment of private wireless broadband networks in rural, remote and underserved regions across the country.

In Trinidad and Tobago, band 106 offers immediate operational advantages for critical sectors:

1. **Energy (oil and gas):** Long-range monitoring of offshore platforms, remote wellheads and pipelines in complex terrain.

2. **Utilities:** Smart grid management, real-time automation and automated meter reading (AMR).

3. **Public safety and defence:** High-reliability, closed user group voice and data communications.

The Authority proposes making band 106 (896–901 / 935–940 MHz) available for private network deployments. The adjacent 902–928 MHz ISM band operates independently and falls outside band 106 parameters.

Under the *Spectrum Plan for Radio and Television Broadcast Auxiliary Services*, domestic studio-to-transmitter links (STLs), transmitter-to-studio links (TSLs) and transmitter-to-transmitter links (TTLs) are allocated starting at 940 MHz, with no current assignments between 940–940.5 MHz. Since high-power broadcast auxiliary services operate adjacent to the private network downlink (935–940 MHz), the Authority will evaluate site geography and require targeted technical coordination with incumbent STL licensees to mitigate adjacent-channel interference prior to authorisation.

4.1.2 Frequency Assignment Plan

The Authority's assignment plan for the 900 MHz band will be based on band/n106, for the accommodation of private networks, as shown in Table 4 and Figure 1. The primary technologies are 4G LTE and 5G NR. Both were standardised simultaneously in 3GPP Release 18, to allow a "dual-mode" or migration path for industrial users like utility companies. A single network can support both band 106 (for existing 4G equipment) and n106 (for newer 5G sensors and devices)

using multi-frequency band indicator (MFBI) technology. This flexibility allows utilities to transition to standardised band 106 devices over time while maintaining compatibility with existing deployments.

The configuration proposed by the Authority allows the entire 10 MHz of the band to be used for a single paired 2 x 5 MHz broadband channel and is designed for high-capacity private LTE (band 106) and 5G (n106) applications.

To maximise spectral efficiency, this frequency assignment plan does not mandate external or separate guard bands. Any necessary guard bands or technical separation distances shall be implemented internally within the designated spectrum blocks allotted to licensees.

Table 4. Frequency assignment plan for private networks in the 900 MHz band

Band	Frequency Range/MHz		Block Name
900 MHz	Mobile Station Transmit	Base Station Transmit	
	896–901	935–940	A

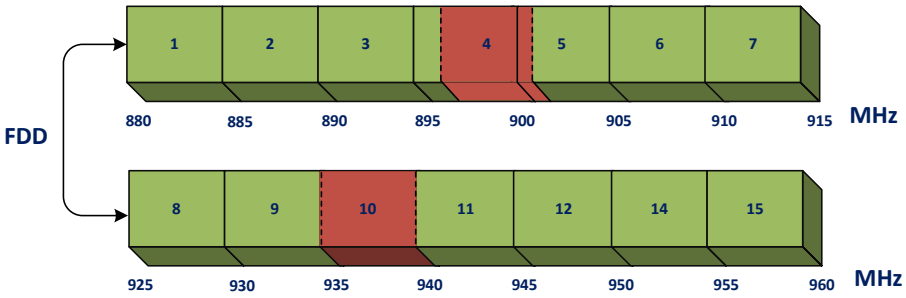

Figure 1. Frequency assignment plan for 900 MHz band

The duplex mode of operation in band/n 106 for private networks is FDD, with duplex spacing of 39 MHz, in alignment with 3GPP standards.

4.1.3 Licensing Process and Conditions

The rules for licensing are as follows:

1. The spectrum available for assignment in band/n106 comprises 2 x 5 MHz of spectrum, with 896–901 MHz paired with 935–940 MHz. The licensing of spectrum in this band shall be on a first-come, first-served basis for the provision of private BWA services.

2. A fixed point-to-multipoint spectrum licence shall be granted to assign spectrum in the 900 MHz band, in accordance with the Second Schedule Table 3 – Other services (spectrum band 216–960 MHz), of the Telecommunications (Fees) Regulations, 2006.

3. A total of 2 x 5 MHz of spectrum shall be licensed in accordance with the proposed frequency assignment plan.

4. The minimum assignment shall be 2 MHz (i.e., 2 x 1 MHz).

4.1.4 Technical Operating Conditions and Specifications

To operate a private network in the 900 MHz band, licensees must comply with the maximum technical operating conditions and specifications detailed in Table 5.

Table 5. Maximum technical operating specifications for the 900 MHz band[5]

Parameter	Maximum Value	Comments
Base and fixed stations maximum EIRP [6]	Indoor: 20 dBm Outdoor: 27 dBm	Licence areas shall define geographic boundaries. Antenna height must not exceed 10 m height above average terrain (HAAT).
Modulation scheme	Digital	Any digital modulation technique (e.g., BPSK, QPSK, 16-QAM and 64-QAM, depending on desired data rates).
Standardisation		3GPP

The parameters outlined in Table 5 may be amended and site-specific or case-by-case technical conditions may be imposed by the Authority, as necessary. Any modified or additional operating conditions will be specified in Schedule B of the licence document issued for the designated radiocommunications system.

[5] These specifications were developed in accordance with FCC 47 CFR Part 90 and ISED SPSP-506.

[6] The maximum transmit power for band 106 (900 MHz private broadband) is regulated by the FCC under 47 CFR Part 27. These rules provide significantly higher power limits for private industrial use compared to standard commercial cellular bands. Reference: *47 CFR § 27.1507 - Effective radiated power limits for 900 MHz broadband systems.*

4.2 The 1500 MHz Band (1427–1470 MHz/1475–1518 MHz)

4.2.1 Selection of the Frequency Assignment Plan

Positioned between sub-1 GHz bands (e.g., 850/900 MHz) and higher mid-band spectrum (e.g., 1800 MHz), the 1500 MHz range offers a balanced combination of wide-area coverage and high-throughput capacity. Identified for IMT at WRC-15, the 1427–1518 MHz band is well-suited for localised, high-performance private 5G networks supporting industrial, energy and enterprise applications.

Deploying dedicated private networks in this band advances key national policy objectives by enabling resilient infrastructure for critical verticals. For regulated sectors such as oil and gas or financial services, private networks in this range strengthen data sovereignty by retaining sensitive operational data within enterprise-controlled local networks.

For operations in the upper 1492–1518 MHz range, adjacent-band coexistence with MSS operating in 1518–1525 MHz requires careful technical consideration, guided by ITU-R studies under Resolution 223 (Rev. WRC-19). Additionally, WRC-23 also initiated separate sharing studies for IMT in the 14.8–15.35 GHz band under Resolution 256.

The proposed 2 x 10 MHz configuration uses a 48 MHz duplex spacing, fully aligning with 3GPP band 74 / n74 specifications, to ensure access to a standardised equipment ecosystem.

Unlike highly congested public mobile spectrum (e.g., 700 MHz), the 1500 MHz range can accommodate specialised enterprise networks without the cost and complexity of competitive spectrum auctions. The Authority proposes making a 2 x 10 MHz paired segment within 3GPP band 74 / n74, specifically 1427–1437 MHz (uplink) / 1475–1485 MHz (downlink), available for private network licensing.

This specific pairing was selected because it provides:

1. **Standard FDD operation:** Delivers a 10 MHz paired block (10 MHz UL / 10 MHz DL) optimised for standard LTE and 5G FDD RAN equipment.

2. **Aeronautical mobile service (AMS) coexistence:** Across several Region 2 administrations, the 1435–1525 MHz range is allocated to aeronautical telemetry for flight testing. Operating within the 1427–1437 MHz lower block positions, private networks safely below this sensitive telemetry band, minimising interference risks through defined geographical coordination.

4.2.2 Frequency Assignment Plan

The frequency assignment plan for the 1500 MHz band is based on a portion of 3GPP FDD band 74/n74, for the accommodation of private networks, as shown in Table 6 and Figure 2.

To maximise spectral efficiency, this frequency assignment plan does not mandate external or separate guard bands. Any necessary guard bands or technical separation distances shall be implemented internally within the designated spectrum blocks allotted to licensees.

Table 6. Frequency assignment plan for the 1500 MHz band

Band	Frequency Range/MHz		Block Name
	Mobile Station Transmit	Base Station Transmit	
1500 MHz	1427–1432	1475–1480	A
	1432–1437	1480–1485	B

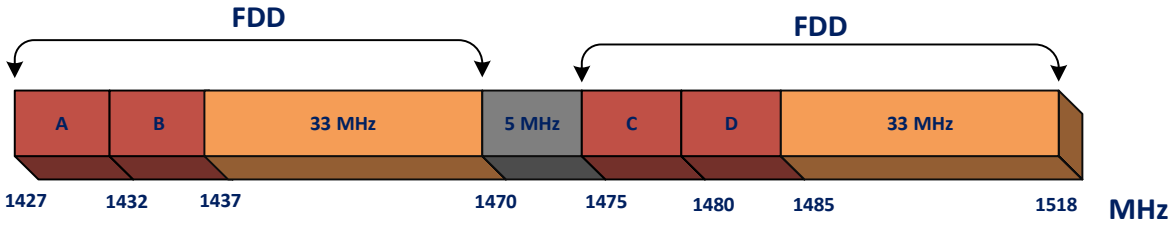

Figure 2. Frequency assignment plan for 1500 MHz band

Blocks A and B, paired with blocks C and D, amounting to 2 x 10 MHz spectrum, shall be available for private networks, with an FDD mode of operation and 48 MHz duplex spacing, in alignment with 3GPP standards.

4.2.3 Licensing Process and Conditions

The rules for licensing are as follows:

1. The licensing of spectrum in the 1500 MHz band shall be for the provision of private BWA services.

2. A fixed point-to-multipoint spectrum licence shall be granted for the assignment of spectrum in the 1500 MHz band, in accordance with the Second Schedule Table 3 – Other services (spectrum band 960–2200 MHz), of the Telecommunications (Fees) Regulations, 2006.

3. Frequency assignments to prospective users shall be via a first-come, first-served licensing process.

4. The allocated spectrum in the 1500 MHz band shall be licensed in accordance with the proposed frequency assignment plan.

5. The minimum assignment in the 1500 MHz band shall be 2 x 5 MHz. Given the limited spectrum available in this band for private networks, there is no requirement for a spectrum cap.

4.2.4 Technical Operating Conditions and Specifications

To operate a private network in the 1500 MHz band, licensees shall not exceed the maximum technical operating conditions and specifications identified in Table 7.

Table 7. Maximum technical operating specifications for the 1500 MHz band[7]

Parameter	Constraint/Maximum Value	Comments
Base and fixed stations maximum EIRP	Indoor: 23dBm Outdoor: 30 dBm	Licence areas shall define geographic boundaries. Antenna height must not exceed 15 m HAAT.
Modulation scheme	Digital	QPSK, 16QAM, 64QAM, 256QAM
Standardisation	N/A	3GPP

The parameters outlined in Table 7 may be amended and site-specific or case-by-case technical conditions may be imposed by the Authority as necessary. Any modified or additional operating conditions will be specified in Schedule B of the licence document issued for the designated radiocommunications system.

[7] These specifications were developed in accordance with FCC 47 CFR 27.

4.3 The Upper 2.4 GHz Band (2483.5–2495 MHz)

4.3.1 Selection of the Frequency Assignment Plan

Globalstar holds authorisation to operate terrestrial wireless services across 11.5 MHz of its MSS spectrum footprint in the 2483.5–2495 MHz band. Internationally, this dedicated spectrum supports private network deployments for enterprise verticals across jurisdictions such as Canada, Brazil, Mexico, Spain and the United States. In Trinidad and Tobago, the Authority has regulated the terrestrial re-use of these satellite frequencies via its *Framework for Authorisation* of *Standalone Ancillary Terrestrial Component Systems (V.1.0)* (the Framework).

Standardised by 3GPP as band 53 (LTE) and n53 (5G), this 11.5 MHz allocation provides interference-free capacity optimised for localised small-cell deployments. Incorporation into 3GPP specifications aligns Globalstar's terrestrial footprint with global device and infrastructure ecosystems, enabling direct access for n53-compliant handsets, chipsets and RAN equipment (as depicted in Figure 3).

Band n53 operates exclusively using TDD, using the full 11.5 MHz contiguous block dynamically for both uplink and downlink transmissions. To prevent self-interference across private deployments, all subscriber devices are time synchronised to the serving base station acting as the primary clock reference.



Figure 3. Band/n53 ecosystem 9
(Source: Globalstar)

Band 53 is licensed across Canada, Mexico and the United States, and several nations in Africa and Europe. In these markets, Globalstar manages the spectrum exclusively, allowing enterprises with in-house or third-party systems integration capabilities to license band n53 directly for private network deployments. In the United States, Globalstar has utilised this 2.4 GHz allocation to enhance terrestrial broadband efficiency and, since 2020, has deployed band 53 private LTE networks across mining operations in the western region.

In accordance with the Framework, the Authority shall enforce a mandatory 5 MHz frequency separation between the ATC spectrum allocation (2483.5–2495 MHz) and adjacent BWA spectrum. This buffer will be maintained until technical studies define refined coexistence criteria for co-channel and adjacent-channel operations.

Recognising the utility of ATC applications in expanding network capacity for IoT and 5G services, the Authority proposes making this 11.5 MHz block available for licensing to closed user groups and private enterprise networks in Trinidad and Tobago. All authorised deployments must comply with the technical and operating conditions outlined in the Framework.

4.3.2 Frequency Assignment Plan

The channel plan for 3GPP band 53 (LTE) and band n53 (5G) is defined by its contiguous, dedicated 11.5 MHz allocation (2483.5–2495 MHz), optimised specifically for low-power terrestrial networks and enterprise private wireless deployments (as shown in Figure 4).

The standard operational configuration for both LTE and 5G utilises a 10 MHz channel bandwidth centred at 2489.25 MHz. The physical layer parameters adhere to standard 3GPP channel rasters:

3. **LTE (band 53):** Configured with a 100 kHz channel raster.

4. **5G NR (band n53):** Supports subcarrier spacings (SCS) of 15 kHz and 30 kHz.

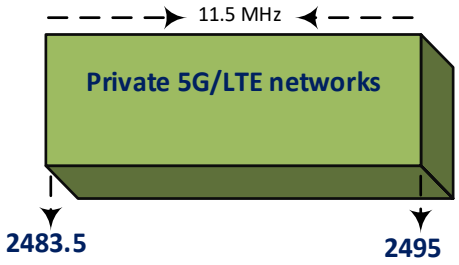

Figure 4. Frequency assignment plan for the upper 2.4 GHz band

4.3.3 Licensing Process and Conditions

The rules for licensing are as follows:

1. Entities interested in using band 53 in Trinidad and Tobago shall secure spectrum rights from Globalstar and inform the Authority, citing the commercial agreement.

2. The licensing of spectrum in the upper 2.4 GHz band shall be for the provision of private or closed user group use, in keeping with FCC §25.149 and ISED's technical and operational requirements for low-power ATC systems and the conditions specified in the Framework.

3. An ATC point-to-multipoint station licence shall be granted to operate an ATC system and shall be subject to licence fees, in keeping with the Telecommunications (Fees) Regulations, 2006 and the Telecommunications Fees Methodology.

4. An ATC point-to-multipoint station licence shall have an annual reporting requirement that would oblige ATC licensees to provide summary information on the number and locations of base stations operating.

5. ATC authorisation shall be conditional upon applicants having valid MSS authorisation from a recognised jurisdiction. Authorisation would be valid until the end of the term of the related MSS authorisation, the discontinuation of the MSS service or the expiration of an ATC station licence, whichever comes first.

6. The spectrum available for assignment in this band ranges from 2483.5–2495 MHz. Frequency assignments to prospective users shall be via a first-come, first-served licensing process.

7. The allocated spectrum in the upper 2.4 GHz band shall be licensed in accordance with the proposed frequency assignment plan.

4.3.4 Technical Operating Conditions and Specifications

As shown in Table 8, operation in the 3GPP band/n 53 (2483.5–2495 MHz) for private or closed user group use shall be in keeping with the adopted FCC §25.149 rules and ISED's technical and operational requirements for low-power ATC systems[8].

Table 8. ATC technical operating parameters

Technical and Operating Parameters	Constraint/Maximum Value	Comments
Maximum power limits	**Access points & devices[9]:** **Fixed transmitter output power:** No more than **1 Watt (0 dBW).** This is	These limits apply to both base stations (access points) and mobile/portable client devices. Assignments are capped at low-power levels (typically 1 Watt

[8] See Appendix I of the *Framework for Authorisation of Standalone Ancillary Terrestrial Component Systems (V.1.0)*
[9] All access points operating in the 2483.5–2495 MHz band shall only operate when authorised by the ATC licensee's NOS, and all client devices operating in the 2483.5–2495 MHz band shall only operate when under the control of such access points.

Technical and Operating Parameters	Constraint/Maximum Value	Comments
	strictly a "low-power" terrestrial designation. **Peak EIRP:** No more than **6 dBW (approx. 4 Watts)**. **Client device: 1 Watt**	transmit power/4 Watts EIRP) to prevent "spillover" into adjacent Wi-Fi bands.
Modulation scheme	Digital	Any digital modulation technique, e.g., BPSK and QPSK.
Out-of-band emission limits	To protect adjacent services (like Wi-Fi below 2483.5 MHz and BWA above 2495 MHz), emissions must be attenuated below the transmitter power (P): **Below 2483.5 MHz:** 40 + 10 log(P) dB at the channel edge. 43 + 10 log(P) dB at 5 MHz from the channel edge. 55 + 10 log(P) dB at X MHz from the channel edge, *where X is the greater of 6 MHz or the actual emission bandwidth.* **Above 2495 MHz:** 43 + 10 log(P) dB on all frequencies between the channel edge and X MHz from this channel edge. 55 + 10 log(P) dB on all frequencies more than X MHz from this channel edge, *where X is the greater of 6 MHz or the actual emission bandwidth.*	Critical GNSS protection: To protect GPS, EIRP density must not exceed -70 dBW/MHz for broadband emissions in the 1559–1610 MHz band.
Standardisation	N/A	3GPP

The parameters outlined in Table 8 may be amended and site-specific or case-by-case technical conditions may be imposed by the Authority, as necessary. Any modified or additional operating conditions will be specified in Schedule B of the licence document issued for the designated radiocommunications system.

4.4 The 3940–3980 MHz Band

4.4.1 Selection of the Frequency Assignment Plan

The 3940–3980 MHz range forms part of the satellite C-band (3700–4200 MHz), allocated domestically to fixed satellite services (FSS) and commercial TVRO stations. However, the 40 MHz segment (3940–3980 MHz) remains unassigned to incumbent commercial TVRO licensees.

This 3940–3980 MHz range, falling within 3GPP band n77, is increasingly designated across ITU-R Region 2 (particularly North America) for private 5G networks and enterprise industrial applications. Because band n77 and the overlapping band n78 represent the dominant global mid-band 5G standard, a mature and cost-effective equipment ecosystem is widely available. Aligning with regional best practices, the Authority proposes allocating this 40 MHz block to private enterprise networks on a primary basis.

Deployment approvals in this band require strict measures to safeguard incumbent services and critical aviation infrastructure, as follows:

1. **Aeronautical radionavigation protection:** Radio altimeters operating in civil and military aircraft operate in the adjacent 4200–4400 MHz band. International studies demonstrate potential out-of-band interference risks from flexible-use 5G operations below 4200 MHz. To mitigate risks to flight safety, the Authority will mandate stringent spurious emission limits for outdoor base stations and establish geographic exclusion or protection zones around airport runways.

2. **Incumbent TVRO protection:** Technical evaluations will account for nearby commercial TVRO ground stations to prevent adjacent-channel receiver overdrive or harmful interference.

The Authority will evaluate site location geometry, operational power levels and relevant international technical standards prior to granting authorisations in this range.

4.4.2 Frequency Assignment Plan

The 3940–3980 MHz portion is designated for the deployment of private networks. The Authority's frequency assignment plan for this range is based on the 3GPP TDD band n77 framework, as illustrated in Table 9 and Figure 6.

To maximise spectral efficiency, this frequency assignment plan does not mandate external or separate guard bands. Any necessary guard bands or technical separation distances shall be implemented internally within the designated spectrum blocks allotted to licensees.

Table 9. Frequency assignment plan for the 3940–3980 MHz band

Band	Frequency Range/MHz	Block Name
	Mobile/Base Station Transmit	
3940–3980 MHz	3940–3950	A
	3950–3960	B
	3960–3970	C
	3970–3980	D

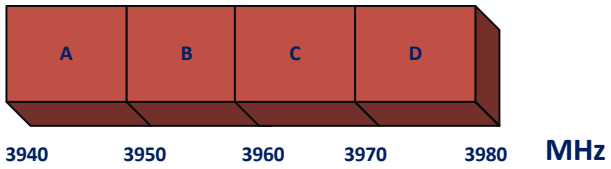

Figure 5. Frequency assignment plan for the 3940–3980 MHz band

4.4.3 Licensing Process and Conditions

The rules for licensing are as follows:

1. The licensing of spectrum in the 3940–3980 MHz band shall be for the provision of private networks within defined geographic areas.

2. A fixed point-to-multipoint station licence shall be granted for the assignment of spectrum in the 3940–3980 MHz band for private networks.

3. Frequency assignments to prospective users shall be via a first-come, first-served licensing process.

4. The allocated spectrum in the 3940–3980 MHz band shall be licensed in accordance with the proposed frequency assignment plan.

5. The minimum assignments in the 3940–3980 MHz band shall be 10 MHz and shall not exceed the spectrum cap in a single area, to ensure multiple users can share the band.

6. The spectrum cap for the 3940–3980 MHz band shall be 20 MHz.

4.4.4 Technical Operating Conditions and Specifications

To operate radiocommunications equipment in the 3940–3980 MHz band, licensees shall not exceed the maximum technical operating conditions and specifications identified in Table 10.

Table 10. Maximum technical operating specifications for the 3940–3980 MHz band[10]

Parameter	Constraint/Maximum Value	Comments
Base and fixed station EIRP limits	**Indoor:** 23 dBm **Outdoor:** 30 dBm	Indoor and outdoor power levels are distinguished to maximise spectrum re-use while protecting nearby commercial TVRO stations. If the private network is located near a commercial TVRO station, equipment with high-rejection filters must be used to ensure that there is no interference.
Standardisation	N/A	3GPP

The parameters outlined in Table 10 may be amended and site-specific or case-by-case technical conditions may be imposed by the Authority, as necessary. Any modified or additional operating conditions will be specified in Schedule B of the licence document issued for the designated radiocommunications system.

[10] These specifications were developed in accordance with Canada's ISED *Framework for 3940–3980 MHz* and ISED *RRS-192 Issue 5*.

4.5 The 24.25–25.1 GHz Band

4.5.1 Selection of the Frequency Assignment Plan

The 24.25–27.5 GHz frequency range, commonly known as the 3GPP band n258, was identified for IMT at WRC-19 and is supported across all three ITU Regions. Within the TTFAT, the band is identified across seven allocations, including co-primary fixed and mobile services. Although a portion of this range (25.35–28.35 GHz) is currently assigned to BWA services, the Authority's 5G Framework designates 24.25–27.5 GHz for IMT implementation. Accordingly, the Authority is reviewing this spectrum to align it with its 5G framework and global harmonisation efforts.

Internationally, the 24.25–27.5 GHz band is the most widely harmonised millimetre-wave (mmWave) band, with significant adoption across Europe and expanding implementation in ITU-R Region 2 (e.g., Colombia's private network proposals and Canada's upcoming ISED releases for the lower 26 GHz band). Compared to higher mmWave frequencies like 28 GHz, the 24 GHz range offers superior signal propagation and greater resilience against heavy rainfall, which is a critical factor for tropical deployments. Consequently, the Authority has selected a portion of band n258 for private network spectrum planning, due to its rain-attenuation advantages, strong alignment with the Authority's 5G framework and robust global ecosystem.

Aligning with international practice (such as Canada's ISED framework), the Authority proposes assigning spectrum in 50 MHz blocks, in alignment with the minimum channel bandwidth supported by 3GPP mmWave standards. A 50 MHz block structure offers key operational benefits as follows:

1. **Granular allocation:** Enterprise applicants can acquire only the capacity needed for their specific footprint, preventing spectrum hoarding and underutilisation.

2. **Flexible scalability:** Licensees requiring higher throughput can request multiple contiguous 50 MHz blocks to support data-intensive industrial applications.

3. **Interference mitigation:** Finer block sizing allows more precise channel assignments, simplifying coexistence management between adjacent operators.

While the mmWave ecosystem continues to mature, major chipset manufacturers including MediaTek, Qualcomm and Samsung, already support band n258, ensuring commercial hardware availability for private networks. Although native support for 50 MHz channel bandwidths in current RAN hardware remains somewhat limited compared to 100 MHz blocks, the ecosystem is expanding rapidly. Applicants should evaluate both current and near-term equipment capabilities when developing their deployment plans.

To balance private industrial requirements with commercial 5G growth, the Authority has reserved 850 MHz of spectrum (24.25–25.10 GHz) in the lower portion of band n258 for private, localised network assignments (such as ports, energy sites and industrial campuses). Reserving this lower segment protects the upper portion of the band (25.10–27.5 GHz) for public MNOs to deploy high-capacity macro networks, ensuring dedicated, interference-free spectrum for industrial enterprises without impacting commercial mobile expansion.

4.5.2 Frequency Assignment Plan

In accordance with the frequency assignment principles of the Plan, the adopted frequency assignment plan for a specified band shall follow the relevant ITU-R recommendation, where applicable, and take into consideration the predominant frequency assignment plan utilised for private wireless services in the particular frequency band. In alignment with ISED's proposed band plan for the lower 26 GHz spectrum for private wireless networks, the Authority proposes to divide 850 MHz of spectrum into eight unpaired spectrum blocks of 50 MHz in the 24.25–25.10 GHz range. The Authority, like ISED, is of the view that this is expected to facilitate shared access, support diverse and localised use cases and enable broader participation from smaller operators and enterprises.

The frequency assignment plan consists of blocks A1 to A8, as shown in Table 11 and Figure 6.

Table 11. Frequency assignment plan for the 24.25–25.10 GHz band[11]

Band	Lower Sub-Band (GHz)	Block Size (MHz)	Block Name
24.25–25.1 GHz	24.250–24.300	50	A1
	24.300–24.350	50	A2
	24.350–24.400	50	A3
	24.400–24.450	50	A4
	24.450–24.500	50	A5
	24.500–24.550	50	A6
	24.550–24.600	50	A7
	24.600–24.650	50	A8
	24.650–24.700	50	A9
	24.700–24.750	50	A10
	24.750–24.800	50	A11

[11] These specifications were developed in accordance with the FCC Report and Order FCC 24-124 and ISED SRSP-522, Technical Requirements for Non-Competitive Local Licensed Systems, including Fixed and/or Mobile Systems, and Flexible Use Broadband Systems, in the band 27.5–28.35 GHz, as both bands 26 and 28 GHz share identical mmWave radio characteristics.

Band	Lower Sub-Band (GHz)	Block Size (MHz)	Block Name
	24.800–24.850	50	A12
	24.850–24.900	50	A13
	24.900–24.950	50	A14
	24.950–25.000	50	A15
	25.000–25.050	50	A16
	25.050–25.100	50	A17

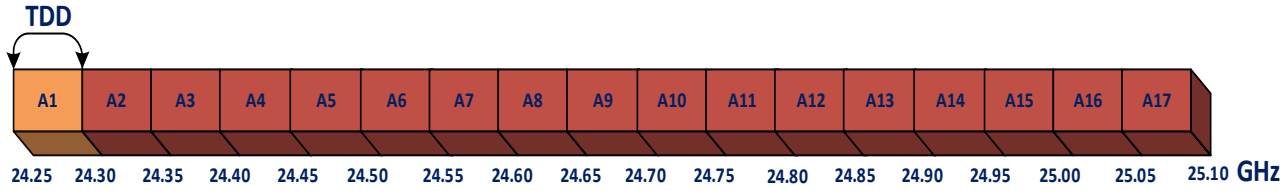

Figure 6. Frequency assignment plan for the 24.25–25.1 GHz band

Frequency blocks available for licensing within the 24.25–25.10 GHz band are designated exclusively for TDD systems. TDD maximises spectral efficiency by eliminating the requirement for fixed guard bands typically needed in FDD layouts. Consequently, this frequency assignment plan does not mandate external or separate guard bands. Any necessary guard bands or technical separation distances shall be implemented internally within the designated spectrum blocks allotted to licensees.

To provide the technical flexibility required for diverse industrial applications and emerging technologies, licensees may aggregate contiguous frequency blocks. Applicants may request multiple contiguous 100 MHz blocks to construct larger channels tailored to high-bandwidth use cases.

The Authority will monitor global ecosystem developments and may consult with industry stakeholders to evaluate alternative assignment options as market and technology requirements evolve.

4.5.3 Licensing Process and Conditions

The rules for licensing are as follows:

1. The spectrum available for assignment in this band ranges from 24.25–25.10 GHz. Frequency assignments to prospective users shall be via a first-come, first-served licensing process.

2. A fixed point-to-multipoint spectrum licence shall be granted to assign spectrum in the 24.25–25.10 GHz band for private wireless networks.

3. The allocated spectrum in the 24.25–25.10 GHz band shall be licensed in accordance with the proposed frequency assignment plan for the provision of private networks within defined geographic areas.

4. The minimum assignment in the 24.25–25.10 GHz band shall be 50 MHz and shall not exceed a spectrum cap of 100 MHz (i.e., 2 x 50 MHz).

5. Any licensee, including affiliates of that licensee, may not hold licences in an area where their aggregate bandwidth exceeds 100 MHz. For this condition, an affiliate is any other entity that controls or is controlled, directly or indirectly, by the other entity, or is controlled, directly or indirectly, by any entity that also controls the first entity.

4.5.4 Technical Operating Conditions and Specifications

To operate private networks in the 24.25–25.10 GHz band, radiocommunications equipment shall not exceed the maximum technical operating conditions and specifications identified in Table 12.

Table 12. Maximum technical operating specifications for the 24.25–25.1 GHz band[12]

Parameter	Constraint/Maximum Value	Comments
Base and fixed station EIRP limits	Indoor: 30 dBm Outdoor: 37 dBm	The 26 GHz band uses strictly controlled EIRP or down-tilt limits to prevent bleeding into satellite uplinks. Cell sizes <1 km even at high power
Total radiated power (TRP) out-of-band emission limits	-39 dBW per 200 MHz	This limit aligns Trinidad and Tobago operations with international WRC-19 Resolution 750 standards to protect adjacent weather satellites and was benchmarked by FCC's recent modification of TRP emission limits via its Report and Order FCC 24-124.

[12] These specifications were developed in accordance with the FCC's *Report and Order FCC 24-124* and ISED SRSP-522, Technical Requirements for Non-Competitive Local Licensed Systems, including Fixed and/or Mobile Systems, and Flexible Use Broadband Systems, in the band 27.5–28.35 GHz, as both bands 26 and 28 GHz share identical mmWave radio characteristics.

Parameter	Constraint/Maximum Value	Comments
Standardisation	N/A	3GPP

The parameters outlined in Table 12 may be amended and site-specific or case-by-case technical conditions may be imposed by the Authority, as necessary. Any modified or additional operating conditions will be specified in Schedule B of the licence document issued for the designated radiocommunications system.

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