



Regulatory framework for satellite-based electronic communications services in The Bahamas

Consultation Document

ECS 75/2024

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1 Introduction

The Utilities Regulation and Competition Authority (“URCA”) is the independent regulator and competition body for the Electronic Communications Sector (ECS) in The Bahamas, which includes fixed and mobile telecommunications services, broadcasting, and the management of spectrum and numbering resources.

URCA has noted significant advancements in satellite communications technologies, particularly with the development of non-geostationary orbit (NGSO) satellite operators offering initially Fixed Satellite Services (FSS) and more recently connectivity services for Earth Stations in Motion (ESIM). This trend has been accompanied by a rise in applications and expressions of interest from entities aiming to provide satellite-based electronic communications services in The Bahamas.

Given the emerging nature of these services, URCA recognizes a potential need to update the regulatory framework governing the ECS (“the Framework”) to better accommodate satellite technology and related services, in terms of the licensing regime for satellite operators, conditions for spectrum use for satellite-based services, and applicable spectrum fees.

As such, URCA has reviewed the regulatory framework with the aim to ensure it:

- a) accommodates and facilitates existing satellite-based services and the projected growth and integration of satellite-based electronic communications services in The Bahamas; and
- b) addresses any relevant regulatory issues/concerns arising from the provisioning of satellite-based services.

The purpose of this consultation is to invite comments from interested parties on URCA’s initial observations and draft proposals to update the Framework, as set out in the remainder of this document.

1.1 Consultation process

URCA invites responses to this Consultation Document from all stakeholders and interested persons. Please note that responses to this Consultation Document must be submitted to URCA on or before 5:00 p.m. on **17 January 2025**.

Written responses or comments on this Consultation Document should be sent to URCA’s Director of Electronic Communications either:

- by mail to P.O. Box N 4860, Nassau, The Bahamas; or
- by email, to info@urcabahamas.bs.

URCA advises that its **office will be inaccessible during this consultation process** due to ongoing renovations. As such, URCA is unable to receive responses by hand, and respondents are

encouraged to submit their responses as requested above. URCA apologizes for any inconvenience caused in this regard. Persons may obtain copies of this Consultation Document by downloading it from the URCA website at www.urcabahamas.bs.

When submitting responses, respondents are required to provide supporting explanations/reasons for each of their submissions. All responses must clearly indicate the reference to the Consultation Document and the questions addressed for each of the responses provided.

URCA will then review the responses received and publish a Statement of Results and Final Decision on the consultation along with URCA's Next Steps in this regard.

URCA reserves the right to make all responses available to the public by posting responses on its website at www.urcabahamas.bs. Responses marked 'confidential' should provide supporting reasons to simplify URCA's evaluation of the request for confidentiality. URCA may, in its sole discretion, choose whether to publish any confidential document or submission. Further information on URCA's procedure for handling information marked 'confidential' submitted by consultation respondents and URCA's consultation procedures in general can be found in URCA's Consultation Procedure Guidelines¹.

Please take note that any response to this Consultation Document that does not comply with the requirements set out herein may not be considered by URCA.

1.2 Legal framework

This subsection sets out the legal framework that governs URCA's power to conduct this consultation process.

Section 4 of the Comms Act provides, inter alia, that the electronic communications policy has as one of its main objectives, to further the interest of persons in The Bahamas in relation to the ECS by promoting affordable access to high quality networks and carriage services in all regions of The Bahamas.

Section 5 of the Comms Act provides that all regulatory measures shall be made with a view to implementing the electronic communications policy objectives. Regulatory measures, inter alia, should be efficient and proportionate to their purpose and introduced in a manner that is transparent, fair and non-discriminatory.

Section 11 of the Comms Act requires URCA to allow persons with sufficient interest a reasonable opportunity to comment on a proposed regulatory measure which, in the opinion of URCA:

- (i) is of public significance; or
- (ii) whose rights or interests may be materially adversely affected or prejudiced by the

¹ URCA 04/2017 available at <https://urcabahamas.bs/wp-content/uploads/2017/07/URCA-042017-URCA-Consultation-Procedure-Guidelines.pdf>

proposed regulatory measure. URCA must also give due consideration to those comments prior to introducing the regulatory measure.

Section 13 of the Comms Act establishes that a regulatory measure is likely to be of public significance if it relates to a regulated sector and can lead to:

- (i) a major change in the activities carried on by URCA under the Comms Act or any other enactment;
- (ii) a significant impact on persons carrying on activities in a regulated sector; and/or
- (iii) significant impact on the general public in The Bahamas or in a part of The Bahamas.

URCA therefore considers that the cumulative effect of the foregoing statutory provisions requires URCA to conduct this consultation process regarding the Framework and any potential decision URCA issues in relation thereto.

1.3 Structure of the Remainder of this Document

The remainder of this document is structured as follows:

- Section 2: Outlines recent, global developments in satellite communications technologies.
- Section 3: Recalls regulatory and policy objectives relevant to satellite-based electronic communications services in The Bahamas.
- Section 4: Discusses the licencing regime applicable to satellite operators and service providers in The Bahamas.
- Section 5: Examines spectrum considerations for the provision of satellite-based communication services in The Bahamas.
- Section 6: Sets out the proposed approach to set the spectrum fees for satellite-based communication services in The Bahamas.
- Section 7: Covers other topics related to the provision of satellite-based communication services in The Bahamas.
- Section 8: Summarises next steps

2 Recent developments in satellite communications technologies

Within this Section, URCA provides its insights into the recent evolution of satellite technologies around the world, their primary use cases in relation to the provision of communications services, and the identified demand for satellite-based communication services to date within The Bahamas.

2.1 Recent developments and use cases for satellite-based electronic communications services

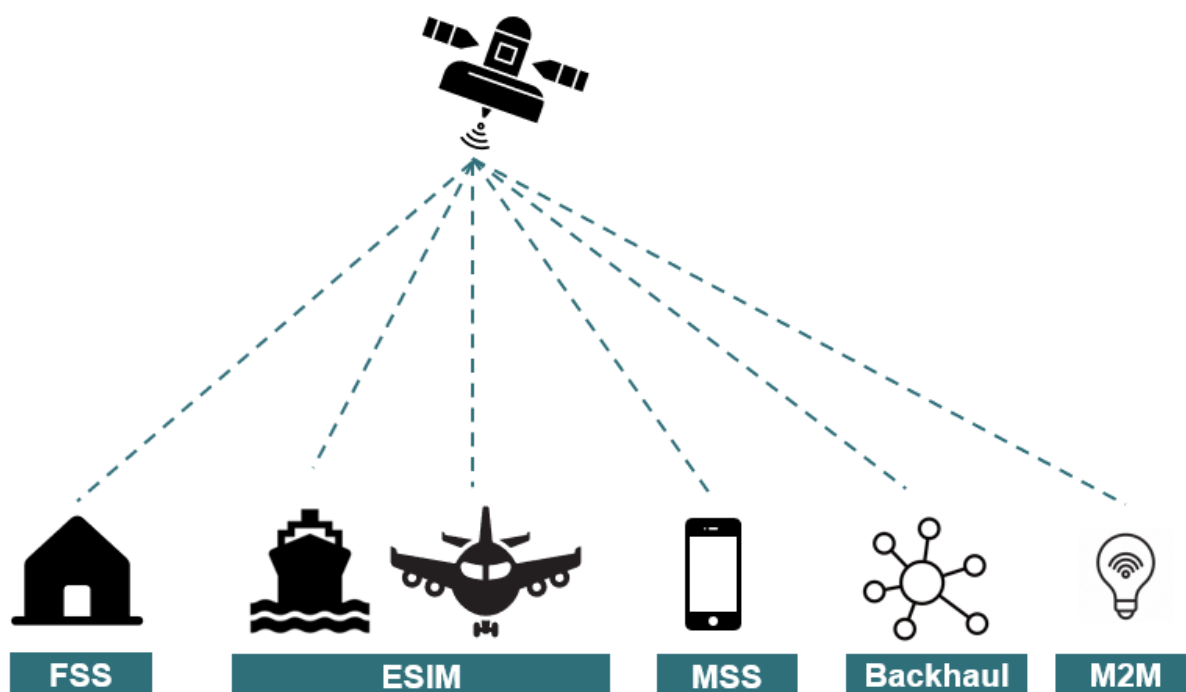
Historically, satellite communication services have primarily relied on geostationary (GSO) satellites to provide low-capacity broadband and broadcasting services. Given the technology of the time, these services catered primarily to remote areas where terrestrial networks were unavailable or economically unviable, but they were limited by relatively low data throughput and high latency compared to terrestrial networks.

Recent advancements in satellite technology have spurred transformative changes across the satellite communications industry. Improvements in satellite launch capabilities and the miniaturisation of satellite hardware have significantly reduced barriers to entry for satellite deployment, paving the way for the development of large constellations of NGSO satellites, often referred to as “mega constellations”. Unlike geostationary satellites, these NGSO satellites, orbit closer to earth, and therefore offer lower latency. Furthermore, innovations in data transmission technologies now allow NGSO satellites to deliver broadband speeds comparable to terrestrial networks.

These technological advancements are reshaping the use cases for satellite communications. Satellite operators are primarily focusing on broadband connectivity for underserved regions. Beyond fixed broadband satellite services (FSS), they are also targeting segments like aeronautical and maritime connectivity (Earth Stations in Motion – ESIM), backhaul links for terrestrial networks, machine-to-machine (M2M) communications, and mobile satellite services (MSS)². Another significant benefit of these new technologies is their ability to provide resilient infrastructure in the aftermath of natural disasters.

² MSS refer to connectivity delivered by satellite networks directly to mobile devices. This is in contrast with connectivity services which require a specific satellite antenna.

Figure 1 : Overview of satellite-based electronic communications services use cases



URCA understands that these use cases exhibit varying levels of maturity:

- **FSS** are particularly valuable to provide broadband connectivity to end-users in rural or hard-to-reach areas where terrestrial infrastructure is limited. These services are already widely available globally and are experiencing steady growth. For example, URCA notes that Starlink has reported over 4 million users across more than 100 countries as of September 2024³.
- **ESIM** systems are designed to maintain a stable connectivity service to moving vehicles (such as airplanes and/or maritime vessels), enabling reliable broadband, voice, and data services for passengers. ESIM services are also gaining momentum worldwide, with many aircrafts, trains and ships being equipped with these systems to enhance passenger experiences.
- **MSS** can be provided using two main architectures to enable direct communications between satellites and mobile devices:
 - The first requires integrating additional modem capabilities into mobile handsets to support satellite-specific frequency bands (MSS spectrum). In this approach, communications do not transit through a terrestrial mobile network and allow NGSO satellite operators to provide standalone mobile voice and data services. However, MSS spectrum is confined to narrow channels in the L and S bands (1.5-2.5 GHz), which limits its capacity. As a result, this architecture is primarily

³ <https://www.techcentral.ie/milestone-in-satellite-internet-growth-reached-as-starlink-passes-4m-users/>

designed for emergency, backup, or basic voice and data services, rather than full-fledged mobile connectivity. Legacy providers of satellite phone services, such as Globalstar and Iridium, have long dominated this niche market. While these services are invaluable for basic communication in isolated regions, their high costs and limited data capacity continue to limit broader market appeal and widespread adoption. In the early 2020s, some handset manufacturers began to integrate satellite connectivity directly into smartphone devices to remove the need for a dedicated satellite phone. Notable examples include devices such as Apple iPhones 14 or later models, which allows users to send iMessages or SMS messages via Globalstar's satellite network⁴ or the Huawei Mate 50 which provide allows users to send SMS messages using the BeiDou Satellite System. However, actual traffic and commercial viability of these new MSS services remain uncertain, with Apple currently offering this feature free of charge on a temporary basis, without options to enable voice calls or data-intensive applications.

- The second uses mobile International Mobile Telecommunication (IMT) spectrum and leverages the existing standardised spectrum and technologies used in terrestrial mobile networks. Since IMT spectrum is generally allocated to MNOs on an exclusive basis, this approach requires partnerships between NGSO satellite operators and MNOs. By using the same devices, spectrum, and technologies as mobile terrestrial networks, this architecture can provide service levels closer to those offered by traditional MNOs and are also referred to as direct-to-device (D2D) services. Several NGSO satellite operators have already announced plans to launch such services using this model. For instance, in September 2023, AST SpaceMobile placed a satellite call over 5G in partnership with AT&T and in December 2023, Lynk Global and Rogers Canada announced plans to launch commercial satellite-to-mobile voice services in 2024 after successful trials. In January 2024, SpaceX launched six Starlink satellites for D2D services to be delivered in partnership with mobile network operators, including T-Mobile US, Optus, Rogers, KDDI and Entel.
- **Backhaul:** Satellite networks can allow fixed or mobile terrestrial operators to expand their coverage in some less densely populated areas by providing backhaul links where traditional fibre, or microwave links are unavailable or cost-prohibitive. These backhaul links typically operate in the C-band, Ku-band or Ka-band.
- **M2M** communications through satellite networks is particularly beneficial in remote or hard-to-reach areas where terrestrial connectivity is limited or unavailable. These applications typically do not require high capacity and can be effectively used within narrow bandwidths, using VHF and L bands.

URCA recognizes that other use cases for satellite services exist, including radio navigation

⁴ About Messages via satellite on your iPhone: <https://support.apple.com/en-ie/120930>

satellite services, amateur satellite services, earth exploration satellite services, as well as radio astronomy and space research satellite services. However, URCA has not identified any recent developments in the technologies or supply ecosystems related to these services that would necessitate changes to its regulatory framework. As a result, these topics will not be explored further in this document.

2.2 Demand for satellite-based electronic communications services in The Bahamas

The demand for licensing of satellite services in The Bahamas has seen substantial growth, with operators seeking to provide FSS and ESIM connectivity solutions. Recognizing this potential, URCA already issued licenses to prominent satellite operators, including Starlink, Viasat, and SES (for its subsidiaries O3b Limited and New Skies Satellite services)⁵.

Additionally, other satellite operators have expressed strong interest in entering the Bahamian market. Several of these companies have reached out to URCA to initiate licensing applications or to inquire about specific regulatory requirements for ESIM, M2M and experimental services in The Bahamas.

Question 1:

Do you have any other comments on the demand and the importance of satellite communication services for The Bahamas?

If so, please provide a detailed explanation of these observations, including supporting evidence where available.

⁵ See Table 2 below.

3 Regulatory and policy objectives relevant to satellite-based electronic communications services in The Bahamas

In this Section, URCA recalls the relevant objectives set out in the Comms Act and in the Government's current sector policy (2020 – 2023 Electronic Communications Sector Policy, ECS Policy hereafter) which are particularly relevant in the context of satellite-based electronic communications services which have been described in the previous section.

URCA is charged with the responsibility, *inter alia*, of promoting the objectives set out in section 4 of the Comms Act. URCA believes that satellite technologies can contribute to several of these objectives:

- (i) enhance the efficiency of the Bahamian ECS and the productivity of the Bahamian economy;
- (ii) promote investment and innovation in electronic communications networks and services;
- (iii) encourage, promote and enforce sustainable competition;
- (iv) promote the optimal use of state assets, including radio spectrum;
- (v) promote affordable access to high quality networks and carriage services in all regions of The Bahamas;
- (vi) maintain public safety and security;

In the ECS Policy, the Government set out five objectives of direct relevance for satellite-based electronic services:

- (i) The Government acknowledges the *“increased intensity and frequency of destructive hurricanes on The Bahamas consequential to the effects of climate change”*, and commits to *“encourage investment in reliable and resilient electronic communications infrastructure”*. This suggests that terrestrial operators should be encouraged to collaborate with satellite providers to create robust and disaster-resilient network solutions.
- (ii) The Government further recognises that *“the Tourism Industry in The Bahamas is the primary driver of the Bahamian economy”* and pledges to *“ensure all tourism centres in The Bahamas are provided with a suite of electronic communications services which, at a minimum, is in similar scope and quality to that provided in the home country of those visitors.”* Given the significant role of cruise ships and airlines in Bahamian tourism, this indicates that the regulatory framework should support the development of ESIM services to meet industry demands.

- (iii) The Government aims to foster the *“development and accessibility of electronic communications technology throughout The Bahamas, and particularly in the Family Islands”* in order to *“deliver multiple social and economic benefits to remote populations”*. This objective could significantly benefit from advancements in satellite technology.
- (iv) The Government considers that it is imperative that appropriate regulatory measures are adopted to *“ensure that radio spectrum is used efficiently by licensees, at prices which reflect as closely as practicable the value of this potentially scarce resource, and recover the costs incurred in the regulation and management of spectrum in a fair and non-discriminatory manner”*.
- (v) Another key provision in the ECS Policy concerns competition within the cellular mobile market. In its most recent assessment, URCA has determined that *“a third mobile entrant would not be commercially viable or further the policy objective of promoting sustainable competition in the cellular mobile market at this time”*. This implies that entry of satellite operators in the retail market to provide cellular mobile access products is not contemplated at this time.

Finally, it is also worth noting that in order to achieve the objectives of its ECS Policy, the Government specifically states that all emerging technologies should be considered and that it *“recognizes the emergence of and technological advancement in low-earth orbit (LEO) satellite system to provide high bandwidth and low communication latency”*

Given the above, URCA identifies the following key objectives for this review of the regulatory framework:

- **Objective 1:** The licensing regime should facilitate the development of satellite-based electronic communications existing services and the market entry of services in all regions of The Bahamas and specifically in the Family Islands.
- **Objective 2:** The licensing regime should accommodate a wide range of emerging use cases related to satellite technology, including ESIM connectivity, while incorporating safeguards to ensure sustainable competition in the cellular mobile market.
- **Objective 3:** The licensing regime should allow operators to provide disaster-resilient network solutions based on hybrid terrestrial and satellite architectures.
- **Objective 4:** The spectrum bands dedicated to satellite operators should be used efficiently, with safeguards to prevent interferences with other users.
- **Objective 5:** Spectrum fees for satellite operators should be set in a non-discriminatory manner, to reflect the potential scarcity of spectrum bands and at a level which allows the recovery of the costs incurred for the regulation and management without deterring market entry.

Question 2:

Do you agree with the regulatory and policy objectives to consider in this review and the resulting five key objectives guiding URCA's review?

4 Licencing regime for satellite operators and service providers

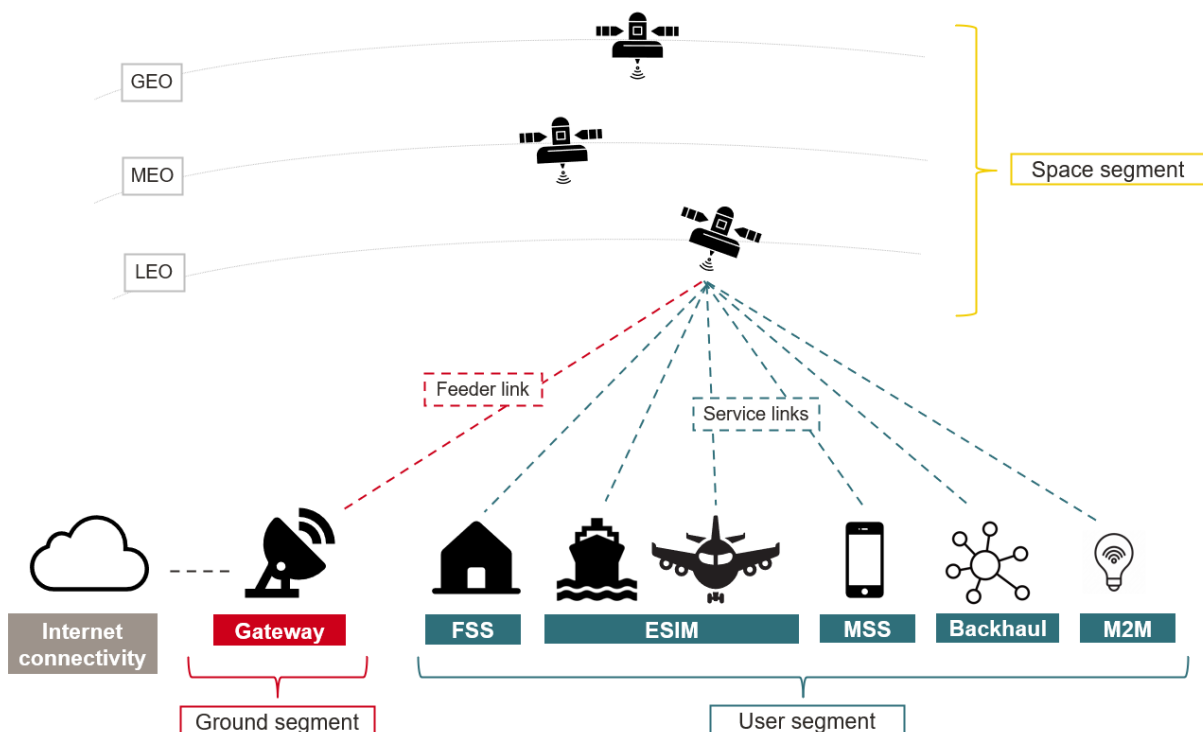
In this Section, URCA describes the different segments of satellite communications, recalls how the current licensing regime is designed and applied to each segment, discusses potential gaps in relation to objectives for this review and recent advancements in satellite technology, and proposes options to address these challenges.

4.1 The segments of satellite systems

Satellite communication systems, whether GSO or NGSO, are generally defined to consist of three segments:

- **The space segment** is composed of one or several satellites used to relay traffic between the gateway(s) and user terminals.
- **The ground segment** is composed of one or more gateways. These are large antennas which connect to a satellite system and are used to provide feeder links, backhaul or to control the satellites.
- **The user segment** is composed of user terminals typically comprising smaller antennas.

Figure 2 : Overview of satellite systems segments



International procedures govern the space segment as these are outside the national boundaries of any country. These procedures are primarily defined by the International Telecommunication Union (ITU) which manages the assignment of frequencies to satellite services and coordinates between different satellite operators to prevent interference among the space segments of various satellite networks.

In contrast, the ground and user segments fall under the jurisdiction of national regulatory authorities which, as for other electronic communications services, may implement licensing regimes for:

- Radio links between satellites and gateways or user terminals (through Spectrum Licences in The Bahamas); and
- the provision of services to end-users (through Operating and Spectrum Licences in The Bahamas).

The following sub-section explains how these licenses are currently used to authorize the satellite operators and service providers for ground and user segments in The Bahamas.

4.1 The current licensing regime and licence terms and conditions

In The Bahamas, URCA has the authority to issue both Operating and Spectrum Licences to satellite operators and service providers.

- Operating Licences are required for the establishment, maintenance and operation of an electronic communications network and provision of carriage services (with or without the use of spectrum).
- Spectrum Licences authorize the use of specified radio frequency spectrum bands. Satellite providers require spectrum to transmit data from their satellites to earth stations and/or end user terminals/devices.

For both types of licenses, URCA relies on three types of authorisations: Individual Licences, Class Licences Requiring Registration, or Class Licences Not Requiring Registration. This tiered approach, summarised in Table 1, offers flexibility to accommodate various types of services⁶.

⁶ The eligibility requirements and terms and conditions for each type of licence are published in URCA's Final Determination on Class Licenses, Exemptions, and Types of Fees – ECS 24/2009.

Table 1 - Comparison of Licence Types

Licence type	Application criteria	Licence conditions	Liability to pay annual fees
Class Licence Not Requiring Registration	Granted automatically provided that the applicant is not registered under an Individual Licence or a Class Licence Requiring Registration	Published on URCA's website	No
Class Licence Requiring Registration	<p>Prospective licensees must submit an application form to URCA along with the required documents as specified in the form.</p> <p>Licensees must meet the registration criteria, which includes compliance with other legal obligations (e.g. maintenance and up to date payments in respect of a business licence and valid Tax Compliance Certificate (TCC) if appropriate).</p> <p>Any application for registration is deemed to be approved unless URCA objects within 45 days.</p>	Published on URCA's website	Yes
Individual Licence	<p>Prospective licensees must submit an application form to URCA along with the required documents as specified in the application form;</p> <p>Licensees must:</p> <ul style="list-style-type: none"> ▪ be legal entities incorporated in The Bahamas ▪ ensure that their administration and management is conducted in The Bahamas ▪ be fit and proper to provide the service or network ▪ have sufficient intention, financial strength, and resources to meet their obligations under the Comms Act [s.26(3) Comms Act] <p>URCA may impose other requirements in the application form.</p> <p>In the case of operating licence, the licence may apply to any notified companies in the licensee's group of companies (not just the named licensee) [s.21 Comms Act]</p>	Specified in Individual Licences and published on URCA's website	Yes

Source: "URCA's Guidance on the Licensing Regime under the Communications Act" (2017 revision).

Since satellite operators generally use shared spectrum, they are typically subject to a Class Spectrum License Requiring Registration. Similarly, because satellite electronic communications service providers generally do not have network infrastructure on public land or offer call termination services, they are typically issued a Class Operating License Requiring Registration.

Table 2: Licences issued to satellite networks and service providers

Name of licensee	Licence type	Use case	Commencement date
Harris Corporation	Class Spectrum Licence Requiring Registration	VSAT	November 2009
Viasat Inc	Class Spectrum Licence Requiring Registration	VSAT	December 2018
O3B Limited	Class Spectrum Licence Requiring Registration	VSAT	March 2019
New Skies Satellites Licensee B.V	Class Spectrum Licence Requiring Registration	VSAT	October 2019
Starlink Services Bahamas Ltd	Class Spectrum Licence Requiring Registration Class Operating Licence Requiring Registration	Fixed Broadband Service and ESIM	February 2023
Hughes Network Systems	Class Spectrum Licence Requiring Registration ⁷	ESIM	October 2024

Source: URCA's public register of: individual licensees and class licensees requiring registration, revised 3 July 2024

As being the case for all licences it issues, URCA may also attach specific conditions or requirements to licenses issued to satellite operators or electronic communications service providers, where deemed necessary. These conditions may include, amongst others:

- Limitations on the use of spectrum to designated bands or geographic areas.
- Restrictions on the types of services that can be offered or the type of user terminals which can be used. These include restrictions to comply with the objective to temporarily protect the cellular mobile market from new entrants (Objective 2).
- Reporting obligations to URCA. These may include obligations to report the number of user terminals for New Providence, Grand Bahama, and Other Islands in order to calculate the applicable spectrum fees.

⁷ While Class Spectrum licenses are typically granted indefinitely unless removed or revoked by URCA under the conditions outlined in the Communications Act, Hughes Network Systems was issued a temporary six-month license. This temporary license will be replaced by a permanent license once the satellite framework is finalized

4.3 Suitability of the Licensing regime in relation to regulatory and policy objectives

In this Section, URCA sets out its assessment on whether the current licensing regime aligns with objectives 1, 2, and 3 outlined in Section 3 (i.e. those relevant to the licensing regime, with the remaining objectives being discussed in sections 5 and 6 below), or if there are gaps that need to be addressed. URCA notes that its assessment is preliminary only and URCA welcomes any comments in regard to any further issues of significant relevance to the licensing regime for satellite-based electronic communications services in The Bahamas.

Objective 1: Promote provision of services in all regions of The Bahamas and specifically in the Family Islands

All Operating and Spectrum Licences, including those relevant for satellite-based services, allow the provision of licenced services on a national basis.

In 2023, URCA issued a licence to Starlink for the provisioning of FSS throughout The Bahamas using the technology-neutral licencing regime described in Section 4.2 above. As far as URCA knows, Starlink’s services are available throughout The Bahamas (including the Family Islands) thereby providing access to satellite-based broadband services on a geographically universal basis.

More generally, URCA is not aware of any specific issues in relation to its existing licensing regime which might deter provision of satellite-based electronic communications services in the Family Islands or elsewhere.

Question 3:

Do you agree with URCA’s preliminary assessment of the current licence regime meeting Objective 1.

If not, please clearly specify any potential gaps or issues that should be addressed to achieve this objective. In doing so, please provide a detailed explanation of these observations, including supporting evidence where available.

Objective 2: Accommodate a wide range of use cases, including ESIM connectivity and temporary licences for testing purposes, while incorporating safeguards to ensure sustainable competition in the cellular mobile market

URCA notes that within its current licensing regime, there are a number of different licence types available which allows some flexibility for applicants, including satellite operators and satellite

providers and their use cases. URCA has reviewed the provisions in its Individual and Class licenses to identify any clauses that might hinder the development of certain satellite-based electronic communication use cases. In conducting this review, URCA found that all provisions within these licence templates are written in a technology-neutral manner and do not contain standard licence terms that may harm these use cases. URCA therefore believes these provisions can be effectively applied to all types of satellite operators and service providers, with the flexibility to add use case- or technology-specific details through ad hoc appendices, directives, guidelines, standards, or other regulatory documents.

URCA also believes its current licensing procedures are straightforward, transparent, and accessible to all interested parties and use cases. The application form is designed to be simple and can be used for all types of license applications (including from satellite operators and/or services providers).

As regards the objective to ensure sustainable competition in the cellular mobile market, URCA recognises that satellite communications services allow the provisioning of electronic communication services on a geographically universal basis throughout The Bahamas and during natural disasters. As such, they are consumer enhancing and will benefit the Bahamian economy and society. However, in line with the Government's position not to at this time facilitate further entry into the mobile market, URCA has attached ad hoc restrictions to Class Licences granted to satellite providers on top of existing restrictions set out in the licence conditions⁸. URCA recognises the potential need to reassess the scope of these restrictions, and suggests adding this to the list of topics for further exploration (see Section 8).

Question 4:

Do you agree with URCA's preliminary assessment of the current licence regime meeting Objective 2?

If not, please clearly specify any potential gaps or issues that should be addressed to achieve this objective. In doing so, please provide a detailed explanation of these observations, including supporting evidence where available.

Objective 3: Allow operators to provide disaster-resilient network solutions based on satellite architectures

Recent hurricanes have underscored the vulnerability of terrestrial communications networks, which may become unavailable during natural disasters such as hurricanes. Satellite-based communication, by contrast, does not rely on terrestrial infrastructure and therefore offers a crucial alternative for maintaining communication during such national emergencies and any

⁸ See URCA's "Final determination on: class licences, exemptions and types of fees"

terrestrial network restoration periods thereafter. Satellite-based communication can support reliable connectivity as either standalone systems or as part of hybrid configurations that work alongside terrestrial networks, ensuring continued access to critical information and emergency services.

URCA is not currently aware of any issues within its existing licensing regime that could hinder the development of satellite-based, disaster-resilient network solutions. However, URCA considers there could be merits to impose requirements on certain licensed satellite operators or service providers to help provide communication services during times of natural disasters in close cooperation with the relevant Government entities. This is further discussed in Section 4.4 below.

Question 5:

Do you agree with URCA’s preliminary assessment of the current licence regime meeting Objective 3?

If not, please clearly specify any potential gaps or issues that should be addressed to achieve this objective. In doing so, please provide a detailed explanation of these observations, including supporting evidence where available.

4.4 Proposed way forward

To summarise its preliminary assessment above, URCA has not identified any significant issues in relation to the current licensing regime that would conflict with the regulatory and policy objectives of this review. URCA considers the current licensing regime to be well-suited for accommodating satellite operators and service providers.

Below, URCA outlines its proposed way forward in terms of licensing and discusses what an obligation to provide communication services during times of natural disasters might entail.

4.1.1 The licensing regime for satellite-based electronic communication services

In the absence of material issues identified within its current licensing regime, URCA proposes to maintain its existing licensing regime while allowing for ad-hoc adaptations to accommodate ongoing technological advancements and business developments in the satellite communications industry, if and when these become relevant to The Bahamas.

URCA believes this flexible approach should enable URCA to address the unique operational characteristics and needs of different satellite providers while maintaining alignment with the key regulatory and policy objectives.

4.1.2 Scope of an obligation to provide communication services during times of natural disasters

URCA sees two main roles for electronic communications services during times of natural disasters.

- The first role is informing the general public of an emergency, imminent threats or dangers to life and/or property by means of public emergency broadcasting services. This is the object of provisions in the current individual and class operating licence templates which require that all licensees, including satellite operators or service providers, to support national security and public safety initiatives in disseminating *“Alert Messages through the NAWS, and/or any other alert messaging system in priority over all other Network traffic data”*.
- The second role is to provide communication services following a natural disaster (such as a hurricane). Here, the role of satellite communications services are especially important, due to the vulnerability of terrestrial electronic communications network infrastructure to storm damage and service disruption. While further discussions between industry stakeholders and relevant Government agencies are needed to determine which licensees are best positioned to provide this support and to define the timeline and scope of that support, URCA sees merits in adding the following provisions on this matter in the ‘MATTERS OF NATIONAL INTEREST’ section of the Individual and Class Operating licenses:

“The licensee shall assist the Ministry of National Security, the Royal Bahamas Police Force, and any other authorized government ministry or agency by providing end user terminals and/or temporarily prioritizing communications from designated terminals over all other traffic.

This prioritisation of designated communications shall remain in effect solely during the period of the relevant emergency or operational need and will cease immediately once the designated government agency issues an official all-clear notification to the public”

Question 6:

Do you agree with UCRA’s proposed way forward on licencing regime to accommodate satellite based services in The Bahamas?

If not, please provide a detailed explanation of your suggestions, including supporting evidence where available.

5 Spectrum considerations for the provision of satellite-based communication services in The Bahamas

Spectrum is a critical resource for delivering satellite-based electronic communication services. In this Section, URCA first examines the spectrum needs to support the development of satellite-based services in The Bahamas (taking into account Objectives 1-3 set out in Section 3 above). URCA then discusses potential interference issues associated with the expansion of NGSO services and considers the necessary safeguards to ensure efficient use of spectrum (taking into account Objective 4).

5.1 Spectrum needs to facilitate the development of satellite-based communication services

Below, URCA outlines the spectrum bands designated for satellite-based services and examines the potential need to allocate additional bands for future satellite use.

5.1.1 Spectrum bands for satellite-based communication services

The availability and allocation of spectrum bands for satellite-based communication services are established through international harmonization processes led by the International Telecommunication Union (ITU). This global coordination ensures that satellite services operate effectively and without interference across borders. These ITU procedures are incorporated into the National Frequency Allocation Table (NFAT) of The Bahamas⁹, which sets the framework for local spectrum use.

Table 3: Spectrum bands for satellite-based communication services

Service	Primary Spectrum Bands	Frequency Range (MHz/GHz)
Mobile Satellite Service (MSS)	L-Band, S-Band	1–2 GHz, 2–4 GHz
Fixed Satellite Service (FSS)	C-Band, Ku-Band, Ka-Band	4–8 GHz, 12–18 GHz, 26–40 GHz
Earth Stations in Motion (ESIM)	Ku-Band, Ka-Band	12–18 GHz, 26–40 GHz
Internet of Things (IoT/M2M)	VHF, L-Band, S-Band, Ku-Band, Ka-Band	137–174 MHz, 1–2 GHz, 2–4 GHz, 12–18 GHz, 26–40 GHz
Backhaul	C-Band, Ku-Band, Ka-Band, Q-Band, V-Band	4–8 GHz, 12–18 GHz, 26–40 GHz, 33–50 GHz, 40–75 GHz

Spectrum bands may be allocated to multiple services, and these allocations are organized into two categories: Primary and Secondary services.

⁹ See Appendix A of the National Spectrum Plan 2020-2023 ECS 02/2020

- **Primary Services** are the dominant users of a given spectrum band. They have priority in terms of usage rights and are protected against interference from other services.
- **Secondary Services** have a subordinate status within a spectrum band. A secondary service can operate within the band but must do so without causing harmful interference to any primary services, whether those services are already established or assigned to that band in the future.

This classification within spectrum bands along with additional specific provisions outlined in the NFAT and ITU Radio Regulations are designed to ensure that services operate effectively while minimizing interference. Section 5.2 below discusses further the interference risks related to spectrum bands used by satellite-based communication services in the context of The Bahamas.

5.1.2 Demand for spectrum

URCA recognizes that the demand for satellite spectrum is a subject of growing interest internationally. In some jurisdictions, as well as in discussions to prepare for the upcoming ITU World Radiocommunication Conference 2027 (WRC-27), satellite operators have expressed interest in additional spectrum allocations to support satellite-based communication services. Below, URCA examines the potential demand for different spectrum bands in The Bahamas and URCA's approach to managing future requirements.

Expected demand in bands below 3 GHz (VHF, UHF, L and S)

The VHF and UHF bands provide narrowband, low-frequency channels that are well-suited to M2M satellite-based communication services. Its lower frequencies enable better signal propagation, allowing M2M communications with objects across a variety of environments. URCA is aware of interest for these bands from a satellite operator aiming to provide M2M communications in The Bahamas.

As indicated in Table 3 above, a subset of the L and S bands can be utilised by MSS providers. These frequencies are relatively resilient to weather disruptions, making them ideal for applications such as satellite phone communications, including voice calls, messaging, and basic data services.

URCA is not currently aware of any demand for L and S bands from satellite operators or service providers in The Bahamas. However, considering recent developments in other countries¹⁰ and the fact that bands currently used for MSS are also identified as relevant bands to support Non-Terrestrial Network component of 5G networks¹¹, it believes that demand may increase in the future.

URCA notes that these bands present unique challenges for shared spectrum use. Due to the

¹⁰ FCC dismissed Starlink's application for MSS : [SpaceX Gen2 MSS Application Dismissed as Unacceptable for Filing | Federal Communications Commission](#)

¹¹ <https://www.3gpp.org/technologies/ntn-overview>

limited ability of small end user antennas to effectively discriminate between signals in these bands, it is not feasible to employ a sharing approach based on frequency or geographic separation. This technical limitation may lead to increased competition for access to these bands, where demand outpaces availability.

Should demand for MSS spectrum in The Bahamas increase to levels that exceed supply, URCA will carefully assess these requests and may consider reclassifying certain Standard Spectrum band as Premium Spectrum as provided in its National Spectrum Plan.

Expected demand in spectrum bands above 3 GHz

URCA has issued spectrum licenses to satisfy demand for Ku and Ka bands to Starlink, Viasat, SES, Hughes and Harris Corporation and notes interest from satellite operators in other countries in utilising new, higher frequency bands to meet the increasing demand for satellite communication services. These higher-frequency bands, specifically V, W, Q, and E bands, offer more available bandwidth, potentially allowing for expanded capacity and enhanced service quality. As interest and demand in these bands grows in the future, URCA will monitor developments in high-frequency spectrum in The Bahamas and engage with stakeholders to ensure that spectrum management decisions align with industry needs and The Bahamas' regulatory objectives to facilitate the development of satellite-based communication services in all The Bahamas and for different types of use cases.

Question 7:

Do you agree with URCA's preliminary views on the expected spectrum demand in low-frequency and high-frequency bands from satellite-based communication services in The Bahamas?

Do you have any other comments on the precise bands that should be opened in priority to satellite-based communication services in The Bahamas?

Please provide a detailed explanation of your views, including supporting evidence where available.

5.2 Interference risks and safeguards

Preventing harmful interference across the spectrum users or services is a key objective of URCA's spectrum management framework. As wireless electronic communication services continue to expand, the likelihood of interference among services increases, requiring effective management strategies. In this Section, URCA assesses potential interference risks related to satellite-based communication services in The Bahamas and outlines considerations for coexistence with other wireless services.

5.2.1 Interference risks related to satellite-based communication services in The Bahamas

Ku and Ka bands are allocated on a co-primary basis, meaning they are shared with other services, which currently include fixed wireless access or backhaul links and going forward, may also include 5G mobile services. In some instances, secondary services also operate within these frequency bands. However, URCA does not anticipate significant interference risks between satellite and these other services:

- **Fixed wireless links** have operational characteristics which allow them to coexist effectively within the same frequency bands with satellite services: satellite antennas point up, while fixed wireless links typically point horizontally. This separation in orientation reduces the likelihood of harmful interference between the two services.
- **5G mobile services** have yet to be launched in The Bahamas, and there is currently no scarcity of spectrum in frequency bands commonly assigned to 5G and more generally to IMT-based mobile services. In its draft “Roadmap to enable 5G deployment in The Bahamas”,¹² URCA outlines plans to release low-band and mid-band spectrum for 5G. However, URCA currently does not anticipate a need for higher bands, such as the Ka-band, which the 3GPP has identified as potential supplementary band,¹³ to also be released for 5G in The Bahamas. URCA therefore does not foresee any significant risk of interference between satellite-based communication services and 5G mobile services in the bands used for satellite-based electronic communication services in The Bahamas.

¹² ECS 73/2024, accessible here: <https://urcabahamas.bs/wp-content/uploads/2024/08/URCA-ECS-732024-Public-Consultation-on-Roadmap-to-Enable-5G-Deployment-in-The-Bahamas.pdf>

¹³ 3GPP band identified band n258 (24.25–27.5 GHz) for 5G which overlaps with the Ka band used for satellite-based communication services

Furthermore, URCA notes that M2M applications are generally designed to operate with a degree of interference tolerance, making them less susceptible to performance issues in shared spectrum environments. As a result, URCA anticipates that M2M services can be subject to more flexible interference management requirements, supporting efficient spectrum use without compromising service quality.

URCA summarises its preliminary views on potential interference risks related to satellite-based communication services in The Bahamas in Table 4 below.

Table 4: Interference risks between satellite communications and other types of services in The Bahamas

Service Type	Frequency Range	Band	3GPP Band ID	Assessment of Potential Risk
FWA	10.7–11.7 GHz	Ku-band	Non-3GPP	Limited risk given horizontal nature of fixed wireless links
5G	24.25–27.5 GHz	Ka-band	n258	Limited risk given no plan to release this band for 5G use in The Bahamas.
FWA	24.25–27.5 GHz	Ka-band	n258	Limited risk given horizontal nature of fixed wireless links
Microwave Backhaul	14.0–14.5 GHz (uplink)	Ku-band	Non-3GPP	Limited risk given horizontal nature of fixed wireless links
Microwave Backhaul	18.0–23.0 GHz (adjacent)	Ka-band	Non-3GPP	Limited risk given horizontal nature of fixed wireless links

Question 8:

Do you agree with URCA’s preliminary views on interference risks for satellite-based communication services in The Bahamas?

Please provide a detailed explanation of your views, including supporting evidence where available.

5.2.2 Provisions to safeguard coexistence of satellite-based communication services with other wireless services

Although the identified interference risks are minimal at this stage, URCA is confident that the existing provisions in its Individual and Class Spectrum Licences¹⁴ as well as procedures outlined in the ITU Radio Regulations are adequate to manage any potential issues. Below in Table 5 URCA provides an overview of the typical mitigation measures that satellite operators can adopt to safeguard coexistence of satellite-based communication services with other wireless services.

Table 5: Typical mitigation measures to safeguard coexistence of satellite-based communication services with other wireless services

Mitigation measures by satellite operators	Description
Frequency Coordination	Coordinate with terrestrial users to ensure non-overlapping use of frequencies through spectrum-sharing agreements.
Guard Bands and Frequency Separation	Allocate guard bands between satellite and terrestrial services to minimize the risk of interference.
Directional Antennas	Use highly directional antennas with narrow beams to minimize interference and spillover into terrestrial bands.
Adaptive Power Control	Adjust satellite transmission power based on interference levels or location to avoid interference with terrestrial wireless services.
Geographical Separation	Place satellite ground stations in remote locations, away from areas where other services are operated in the same bands.
Beamforming and Beam Steering	Use advanced beamforming techniques to focus signals only where needed, minimizing potential interference with terrestrial systems.
Cross-Polarization	Employ cross-polarization, where satellite signals use different polarizations from terrestrial signals in the same band.
Dynamic Spectrum Access (DSA)	Use cognitive radio technologies to dynamically switch to unoccupied frequency bands based on real-time spectrum availability.
Frequency Relocation	Shift satellite services to higher bands like V-band or Q-band where there is less congestion and interference risk.

While most of the mitigation measures listed in the table above apply to both GSO and NGSO operators, URCA understands that LEO operators should rely more specifically on DSA and adaptive beamforming, rather than geographical separation or exclusion zones.

¹⁴ The section on Radio Spectrum provides that “The Licensee shall take all necessary steps to ensure that the use of the Licensed Radio Spectrum is safe and does not cause Harmful Interference to the other existing Radiocommunications Stations and Networks operating in the same geographical area or radio frequency band or in adjacent areas or bands”

Where necessary, URCA may consider the imposition of specific conditions on the use of radio spectrum, setting parameters for Power Flux Density (PFD) limits, Out-of-Band Emissions (OOBE), or minimum elevation angles in certain areas. Additionally, URCA may require satellite operators to report any planned changes to service areas or beam coverage within The Bahamas. This would allow URCA to assess potential impacts on spectrum users and, if needed, determine appropriate actions to mitigate interference.

Question 9:

Do you agree with URCA's proposed safeguards to prevent any future interference issues?

Please provide a detailed explanation of your views, including supporting evidence where available.

6 Spectrum fees for satellite-based communication services in The Bahamas

In this Section, URCA reviews the current structure of spectrum fees for satellite-based electronic services in The Bahamas, examines key principles that would most effectively support the regulatory and policy objectives outlined in section 3, and proposes amendments to the fee schedule to align with these goals.

6.1 Current spectrum fees for satellite-based electronic services

Satellite-based electronic communication services in The Bahamas currently operate within spectrum bands classified as Standard Spectrum in the National Spectrum Plan. Under section 93 of the Communications Act, 2009, URCA is authorized to impose spectrum fees within these bands. The current fee schedule, as outlined in Table 4 below, contains spectrum fees for satellite-based electronic services on the type and quantity of equipment used, without differentiating fees by spectrum band. In particular:

- **Earth Stations (gateways):** Fees for earth stations are calculated based on the dish size.
- **ESIMs:** Fees for ESIMs are applied based on fleet size.
- **FSS Terminals:** These are charged on a per-user basis, with the fees varying by island. This structure is also degressive, meaning that as the number of users increases, the per-user fee decreases. The goal of this geographically tiered approach was to promote affordability of FSS in less densely populated islands.
- **M2M Terminals:** No fees are currently imposed on M2M terminals.

Table 4. Spectrum fees applicable to satellite-based communication services in The Bahamas

Use case	Description	Spectrum fee (per annum)
Satellite earth station	Satellite terminals with dish size equal to or greater than 3 metres	\$4,500
	Satellite terminals with dish size less than 3 metres	\$500
ESIM	Private single aircraft or vessel	\$200
	Commercial fleet size less than or equal to 5 aircrafts or vessels	\$500
	Commercial fleet size greater than 5 and less than or equal to 16 aircrafts or vessels	\$3,000
	Commercial fleet size greater than 16 and less than or equal to 50 aircrafts or vessels	\$8,500
	Commercial fleet size greater than 50 aircrafts or vessels	\$25,500
FSS	New Providence - 5000 or fewer User Terminals	\$500
	New Providence - Between 5001 – 10000 User Terminals	\$333
	New Providence - More than 10000 User Terminals	\$167
	Grand Bahama - 5000 or fewer User Terminals	\$100
	Grand Bahama - Between 5001 – 10000 User Terminals	\$67
	Grand Bahama - More than 10000 User Terminals	\$33
	All Other Islands - 5000 or fewer User Terminals	\$50
	All Other Islands - Between 5001 – 10000 User Terminals	\$33
	All Other Islands - More than 10000 User Terminals	\$17

Source: URCA's Fee Schedule, tables 11A, 11B, 11C, February 2024

6.2 Spectrum pricing principles to support regulatory and policy objectives in The Bahamas

To align with objectives set in Section 3, URCA has identified four key principles to guide the design of spectrum fees for satellite-based services. These principles are not specific to satellite spectrum but apply to all Standard Spectrum, aiming to ensure that spectrum fees balance administrative cost recovery, encourage market growth, account for spectrum scarcity, and maintain fairness across different users. Each principle is further examined in the following paragraphs.

6.2.1 Promoting Market Entry and Expansion

Spectrum fees should be set low enough to encourage market entry and support the growth of satellite services, particularly for emerging technologies such as machine-to-machine communications and for expanding service coverage in less densely populated areas. URCA recognizes, however, that spectrum fees alone may not fully incentivize service providers to pass along lower costs to end users in these regions. For instance, although fees are structured to be lower in lower-density areas, providers often maintain uniform FSS retail pricing across The Bahamas, limiting cost advantages for users in remote areas. This suggests that geographical differentiation of spectrum fees might not be relevant to meet URCA's policy and regulatory objectives.

6.2.2 Reflecting Spectrum Scarcity and ensuring optimal use of radio spectrum

Spectrum fees should also consider the scarcity of the bands used by satellite-based communication services. In most cases, the potential scarcity value for satellite spectrum remains low due to the availability of large bands and the ability for multiple satellite networks to coexist within these bands.

As noted in Section 5.1.2, MSS spectrum may represent an exception, where scarcity considerations may apply in future. URCA will continue to monitor these dynamics and adjust fees if necessary to reflect scarcity where it becomes a significant factor.

6.2.3 Enhancing Clarity and Enforceability of the Fee Schedule

URCA has noted challenges faced by applicants in estimating applicable spectrum fees, particularly for use cases like ESIM, where tracking the number of terminals, vessels or aircraft operating in Bahamian territory can be difficult. URCA therefore considers that removing these parameters from the fee schedule would improve both the ease of interpretation for applicants and the enforceability of the fees.

6.2.4 Non-Discriminatory Fee Structure

Ensuring non-discriminatory access to spectrum means that similar users should be treated with similar conditions, though this does not necessarily require applying a single rate to each applicant. URCA does not anticipate significant differences in scarcity value between licensees. However, it considers that setting spectrum fees in function of the quantity of spectrum used can promote an efficient use of the spectrum and ensure a clear and predictable level of fees.

6.3 Proposals to amend the spectrum fee structure for satellite-based electronic services

Given the principles identified in the section above, URCA intends to :

- a) Remove the geographical differentiation of FSS users which has not proven to be relevant.
- b) Use quantity of spectrum instead of the number of users or type of use as the basis for differentiating spectrum fees between licensees.
- c) Introduce a temporary spectrum fee relief for applicants seeking to test their service prior to commercial launch.

As such, URCA proposes to replace Tables 11B and 11C of the Fee Schedule by the following formula for the annual spectrum fee applicable to ESIM and FSS licensees:

- Annual fee per licensee = \$0.70 / MHz

For applicants wishing to test their service prior to commercial launch, URCA proposes an exemption from the annual fee to support market entry and encourage innovation.

Question 10:

Do you have any comments on the principles et revised structure proposed by URCA for satellite-based electronic communications services in The Bahamas?

Please provide a detailed explanation of your views, including supporting evidence where available.

7 Other topics related to the provision of satellite-based communication services in The Bahamas

In this section URCA covers other topics in relation to the regulatory and policy objectives set out in Section 3 above that are relevant to satellite-based communications services.

7.1 Matters of national interest

Satellite service providers, including those operating outside The Bahamas must comply with the provisions of the Interception of Communications Act, 2018. This legislation requires providers to “*take such steps as are necessary to facilitate the execution of an interception or entry warrant, or both.*” To support enforcement of this obligation and align with URCA’s objective to “*maintain public safety and security*”, URCA proposes to introduce the following requirements for satellite service providers conducting the administration and management of their business from premises outside of The Bahamas:

- a) **Local Data Storage Requirement:** Satellite service providers must store communications data (as defined in the Interception of Communications Act) within The Bahamas. This ensures that data necessary for lawful interception remains physically accessible within the jurisdiction.
- b) **Local Representation Requirement:** Satellite service providers must appoint a local representative responsible for managing lawful interception requests and ensuring compliance with regulatory requirements.

These requirements could either (i) be incorporated into the terms and conditions of the COLRR, applying specifically to operators conducting business administration and management from outside The Bahamas, or (ii) be included in license approval letters.

Question 11:

Do you have any comments on the proposed requirements for satellite service providers conducting the administration and management of their business from premises outside of The Bahamas?

Please provide a detailed explanation of your views, including supporting evidence where available.

7.2 Universal Service

Universal service obligations can play a crucial role to support URCA’s objective to “*promote affordable access to high quality networks and carriage services in all regions of The Bahamas*”.

As already set out in Individual and Class licensees, Satellite operators or service providers are liable contribute to any Universal Service Fund which would be set by URCA in accordance with the Communications Act.

Question 12:

Do you have any comments on other topics related to the provision of satellite-based communication services in The Bahamas which should be considered by URCA?

Please provide a detailed explanation of your views, including supporting evidence where available.

8 Next Steps

Following a review of responses to this Consultation Document, URCA will:

- Publish the final regulatory framework for satellite-based electronic communications services in The Bahamas.
- Update its fee schedule in February 2025.
- Explore if it would be worth adjusting the current restriction on new entry in the mobile cellular market to allow:
 - The provision M2M or basic voice and messaging services based on MSS spectrum and/or
 - Partnerships between existing mobile network operators and satellite providers to develop, amongst others, backhaul support or supplemental device-to-device (D2D) coverage in areas where terrestrial infrastructure is not economically viable.
- Engage with all stakeholders to advance any other actions identified during this consultation.