



REVISION TO SPECTRUM PRICING

A consultation on proposals for Spectrum Licence Fees for
recommendation to the MSET

Spectrum Management Authority
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Spectrum Pricing Review Consultative Document

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Section 1

Summary

Summary of Proposals

1.1. This Consultative Document concerns a set of proposals to revise spectrum licence fees in Jamaica, to include the introduction of new factors, in some instances, to the algorithm/mechanism used to determine certain fees. These proposals are the results of a “review of prices” exercise, conducted by Engine Room Limited (‘the Consultants’), the consultancy company engaged by the Spectrum Management Authority (‘the SMA’). (*See related report in Annex 2*) Subsequent to this consultation, the SMA shall submit its recommendations, for a decision, to the Minister/Ministry of Science, Energy and Technology (‘MSET’), in accordance with the Telecommunications Act 2000, *Part IV, Section 23 (7) A person to whom a spectrum licence is granted under this section shall pay such fees as the Minister may determine by notice in writing to that person.* The proposals herein relate to Administrative Pricing aimed at managing the spectrum efficiently.

1.2. The purpose of this Consultative Document is largely twofold:

- To present proposals for updating/revising spectrum licence fees applied to certain licence types; and,
- To provide an opportunity for all interested stakeholders to participate in determining the level of spectrum licence fees to be charged in Jamaica.

1.3. This Consultative Document concentrates on the following licence types:

- **Mobile Service (MS):**
Access Spectrum: 700 MHz, 850 MHz, 900 MHz, 1800 MHz, 1900 MHz and 1700/2100 MHz (AWS)
- **Fixed Service(FS):**
 - a. *Point to Point (PtP):* 5GHz, 6 GHz, 7 GHz, 8 GHz, 11 GHz, 13 GHz, 15 GHz, 18 GHz and 23 GHz
 - b. *Point to Multipoint (PtMP):* 5 GHz, 2.5/2.6 GHz and 3.5 GHz, and 10 GHz.
- **Fixed Satellite Service (FSS):**
 - a. *C-Band:* 3.625-4.2 GHz (space to earth), 5.850-6.425 GHz (earth to space);
 - b. *Ku-Band:* 12-18 GHz; and,

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- c. *Ka-Band*: 18-30 GHz (earth to space), 26-40 GHz (space to earth).

This Consultative Document further looks in detail at the proposed changes to the spectrum licence fees relating to the abovementioned type of services.

Proposed Adjustments to Spectrum Licence Fees

- 1.4. The changes outlined in this consultation, if accepted at the end of the process by the Minister/MSET, is proposed to only impact applications for:
- a. additional spectrum – incumbent operators;
 - b. spectrum licences for which the licence tenure has expired and is to be renewed – incumbent operators; and,
 - c. spectrum acquired by a new entrant.

Again, the abovementioned will only occur after a decision by the Minister/MSET to accept the adjustments. Additionally, for clarity with respect to item “b” above - where a licensee holds a licence with tenure for 5, 10 or 15 years, it is only when that licence tenure has expired, and the applicant is seeking to renew the tenure of the licence that the new/adjusted prices would come into effect.

- 1.5. Persons who wish to express opinions on this Consultative Document are invited to submit their comments **in writing to**:

The Managing Director
Spectrum Management Authority
13-19 Harbour Street
Kingston
consultation@sma.gov.jm

The deadline for submission of comments is 1 pm, on 2020 July 17.

See Annex 1 for further information on how to respond to this consultation

Publication of Submissions

Responses to this Consultative Document are a vital part of the consultation process, and so as far as possible, should also be publicly available. The SMA is of the opinion that respondents should have an opportunity to find out the views put forward in other responses, which they may disagree, and to comment on them.

To allow responses to be publicly available, the SMA intends to publish all submissions on our website, including any personal information contained in the submission (such as names and contact details of submitters). Any confidential

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information should be submitted separately and clearly identified as such. Information claimed (and the SMA has accepted) to be confidential, will not be published or otherwise released unless required or authorized by law. In the interest of promoting transparent debate, respondents are requested to limit as far as possible the use of confidential markings.

The timeline for the consultation is summarized in the Table below. This includes an indicative timing for the submission of SMA’s recommendation to MSET.

Event	Date
Response to this document	July 17, 2020
Comments on responses	July 24, 2020
Final Statement	July 31, 2020
Submission of Recommendation	August 14, 2020

1.6. The proposed changes are as follows:

A. Mobile Services – Access spectrum

Mobile Access Bands	Current Fee (\$US) Price/MHz/Year	Proposed Fee (\$US) Price/MHz/Year	Change/MHz (\$US)	Change (%)
700 MHz	69,444.44	69,600	155.56↑	00.22%↑
850 MHz	61,162.00	38,280	22,882.00↓	37.41%↓
900 MHz	51,376.00	34,800	16,576.00↓	32.26%↓
1800 MHz	42,813.57	27,840	14,973.57↓	34.97%↓
1900 MHz	42,813.57	34,800	8,013.57↓	18.72%↓
AWS (1700/2100)	42,813.57	48,720	5,906.43↑	13.80%↑

B. Fixed Service

- **PtP:** The following algorithm is used to determine spectrum licence fees for PtP

$$\text{Annual Spectrum Licence Fee} = (\text{Base Fee} * \text{BW} * \text{BD} * \text{Z} * \text{P} * \text{E} * \text{T}) / \text{Y}$$

Where: BW is Bandwidth factor
 BD is Frequency Band factor
 Z is Zone factor
 P is Network Type factor
 E is Exclusivity factor
 T is License Tenure factor
 Y is the number of years

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See proposed changes in the table:

Parameters	Current Value/Range	Proposed Value/Range
Base Fee (Proposed Change)	Varies between \$100,000 and \$2,000,000	Values per MHz are <ul style="list-style-type: none"> • \$20,000 for 0-50 MHz • \$15,000 for 51-100 MHz • \$10,000 above 100 MHz
Bandwidth factor (Proposed Change)	Bandwidth/3.5, rounded up	Bandwidth
Frequency Band factor (No Change)	Values are <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz • 1.00 for 10.150 – 10.650 GHz • 0.80 for 10.700 – 11.700 GHz • 0.60 for 12.750 – 15.350 GHz • 0.40 for 17.700 – 23.600 GHz • 0.20 for above 24.250 GHz 	Values are <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz • 1.00 for 10.150 – 10.650 GHz • 0.80 for 10.700 – 11.700 GHz • 0.60 for 12.750 – 15.350 GHz • 0.40 for 17.700 – 23.600 GHz • 0.20 for above 24.250 GHz
Zone factor (No Change)	Values are <ul style="list-style-type: none"> • 0.10 for Zone 1 • 0.06 for Zone 2 • 0.04 for Zone 3 	Values are <ul style="list-style-type: none"> • 0.10 for Zone 1 • 0.06 for Zone 2 • 0.04 for Zone 3
Network Type factor (Proposed Change)	Values are <ul style="list-style-type: none"> • 1.00 for Private networks • 2.00 for Commercial networks 	Values are <ul style="list-style-type: none"> • 0.50 for Private networks • 1.00 for Commercial networks
Exclusivity factor (No Change)	Values are <ul style="list-style-type: none"> • 1.00 for Exclusive use • 0.50 for Shared use 	Values are <ul style="list-style-type: none"> • 1.00 for Exclusive use • 0.50 for Shared use
License Tenure factor (Proposed Change)	Values are <ul style="list-style-type: none"> • 1.00 for 5 years • 1.80 for 10 years • 2.60 for 15 years 	Values are <ul style="list-style-type: none"> • 1.00 for 5 years • 1.70 for 10 years • 2.20 for 15 years
Efficiency factor (New Factor)	N/A	Values are <ul style="list-style-type: none"> • 1.00 for Category 1 • 0.75 for Category 2
Inflation factor (New Factor)	N/A	Values are as published by the Statistical Institute of Jamaica

The proposed algorithm was applied to a sample of 198 commercial licences, and 8 private/non-commercial licences taken from the SMA’s database, utilizing various microwave point to point bands. The table below shows the summary of the outcome when the proposed algorithm was applied to the sample.

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Commercial licences

SAMPLE COUNT	SAMPLE OUTCOME	SAMPLE % CHANGE	POTENTIAL FINANCIAL IMPACT		
			Licence Fee	Reg. Fee	Total
198	Average Reduction	-12.16%	\$(23,848,902)	(16,669,223)	(40,518,125)
198	Weighted Average Reduction	-17.33%	\$(33,983,191)	(23,752,597)	(57,735,788)
2	Largest Gain	27.35%	\$53,630,537	37,485,136	91,115,673
2	Largest Reduction	-51.00%	\$(100,010,006)	(69,902,129)	(169,912,135)
21	Smallest Gain	2.86%	\$5,602,801	3,916,086	9,518,887
4	Smallest Reduction	-2.00%	\$(3,921,961)	(2,741,260)	(6,663,221)

Private/Non-commercial licences

SAMPLE COUNT	SAMPLE OUTCOME	SAMPLE % CHANGE	POTENTIAL IMPACT ON POPULATION		
			Licence Fee	Reg. Fee	Total
8	Average Reduction	-16.67%	\$(526,520)	\$(184,282)	\$(710,802)

PtMP: The same algorithm is used to determine spectrum licence fees for PtMP
Where,

$$\text{Annual Spectrum Licence Fee} = (\text{Base Fee} * \text{BW} * \text{BD} * \text{Z} * \text{P} * \text{E} * \text{T}) / \text{Y}$$

See proposed changes in the table:

Parameter	Current Value/Range	Proposed Value/Range
Base Fee (Proposed Change)	Bands using 5MHz Channel Plans	
	Bandwidth	Base Fee (J\$ Million)
	2 x 5	2
	2 x 10	4
	2 x 15	6
	2 x 20	8
	2 x 25	10
	Bands using 3.5MHz Channel Plans	
	Bandwidth	Base Fee (J\$ Million)
	2 x 3.5	2
	2 x 7	4
2 x 14	6	
2 x 28	8	
2 x 56	10	
Bandwidth Factor (Proposed Change)	Bandwidth / 3.5, Rounded up	Bandwidth
Frequency Band Factor	Values are: <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz 	Values are: <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz

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Parameter	Current Value/Range	Proposed Value/Range
	<ul style="list-style-type: none"> 1.00 for 10.150 – 10.650 GHz 0.80 for 10.700 – 11.700 GHz 0.60 for 12.750 – 15.350 GHz 0.40 for 17.700 – 23.600 GHz 0.20 for above 24.250 GHz 	<ul style="list-style-type: none"> 1.00 for 10.150 – 10.650 GHz 0.80 for 10.700 – 11.700 GHz 0.60 for 12.750 – 15.350 GHz 0.40 for 17.700 – 23.600 GHz 0.20 for above 24.250 GHz
Zone Factor (Proposed Change)	Values are <ul style="list-style-type: none"> 0.10 for Rural Only Services 0.20 for Island Wide Services 0.25 for Urban Services 	Values are <ul style="list-style-type: none"> 0.04 for Rural Only Services 0.06 for Island Wide Services 0.10 for Urban Services
Network Type Factor (Proposed Change)	Values are <ul style="list-style-type: none"> 1.00 for Private Networks 2.00 for Commercial Networks 	Values are <ul style="list-style-type: none"> 0.50 for Private Networks 1.00 for Commercial Networks
Exclusivity Factor (No Change)	Values are <ul style="list-style-type: none"> 1.00 for Exclusive Use 0.50 for Shared use 	Values are <ul style="list-style-type: none"> 1.00 for Exclusive Use 0.50 for Shared use
License Tenure Factor (Proposed Change)	Values are <ul style="list-style-type: none"> 1.00 for 5 years 1.80 for 10 years 2.60 for 15 years 	Values are <ul style="list-style-type: none"> 1.00 for 5 years 1.70 for 10 years 2.20 for 15 years
Efficiency Factor (New Factor)	N/A	Values are <ul style="list-style-type: none"> 1.00 for Category 1 0.75 for Category 2
Inflation Factor (New Factor)	N/A	Values are as published by the Statistical Institute of Jamaica

The proposed algorithm was applied to a sample of six (6) commercial licensees, related to a group of four microwave P2MP bands which were taken from the SMA’s database. The table below shows the summary of the outcome when the fees emerging from the proposed algorithm are compared with the current algorithm. Please note that in this case, the total payable fees are the sum of the spectrum licence fee and the 70% regulatory fee.

Licensees	Total Fees (Current)	Total Fees (Proposed)	Variance	Variance %
1	\$ 19,584,000.00	\$ 32,130,000.00	\$ 12,546,000.00	64.06%
2	\$ 1,224,000.00	\$ 2,099,160.00	\$ 875,160.00	71.50%
3	\$ 6,800,000.00	\$ 74,636,800.00	\$ 67,836,800.00	997.60%
4	\$ 59,993,558.83	\$ 46,267,200.00	\$ (13,726,358.83)	-22.88%
5	\$ 26,705,112.90	\$ 5,140,800.00	\$ (21,564,312.90)	-80.75%
6	\$ 3,672,000.00	\$ 4,284,000.00	\$ 612,000.00	16.67%
TOTAL	\$ 117,978,671.74	\$ 164,557,960.00	\$ 46,579,288.26	39.48%

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C. Fixed Satellite Service

Recommended annual spectrum licence fees are as follows

VSAT Spectrum Fees

Current Fees	Recommended Fees		
Annual Spectrum Fee J\$	Number of VSAT terminals	Annual Spectrum Fee (J\$)	
\$500,000 per Terminal		Direct to Business (DTB)*	Direct to Home (DTH)*
	Up to 30	\$200,000	\$150,000
	More than 30	\$6,500 per terminal	\$5,000 per terminal

* A spectrum licence fee discount of 50% applicable to terminals installed in businesses, homes and special targeted groups (Police Stations, Hospitals, Health Centers, Youth Clubs, Schools, Libraries) located in rural unserved and underserved communities across the island. The desired outcome is that this discount will be applied in such a way that the regulatory fee is calculated before the spectrum licence fee discount is applied.

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Section 2

Background

- 2.1. Part of the role and function of the SMA is to create the framework within which the spectrum will be used in an economically and technically efficient manner, thereby acting as a catalyst for enterprise, innovation and economic growth. Additionally, the SMA also provide quality advice to the Government of Jamaica on spectrum policy and regulatory issues.
- 2.2. In 2019 January, the MSET engaged a Consultant from the International Telecommunications Union, who completed a review of Jamaica's Telecommunications Policy and Regulatory Framework. The recommendations included the need to review spectrum prices.
- 2.3. In light of the above, the SMA has embarked on this exercise in part, to advise the Minister on the rates to consider.

POLICY FRAMEWORK FOR SPECTRUM MANAGEMENT FEES

- 2.4. The determination of fees associated with the management of the spectrum takes account of two basic factors.
 - The recovery of costs (operational and administrative) associated with the management of the spectrum; and,
 - A reliable estimate of the market value of the spectrum. Such estimate would consider the need to encourage efficient use of the spectrum, investment in the sector, ensure reasonable end-user prices and universal access to communication and other services which use the spectrum.

Therefore, in keeping with international best practice, spectrum pricing shall seek to:

- a. Reflect the economic value of the spectrum;
- b. Promote public policy goals;
- c. Be derived through a transparent process;
- d. Take account of the level of spectrum usage;
- e. Minimize cost barriers to entry; and
- f. Foster competition and the provision of services at affordable prices.

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THE LEGISLATIVE FRAMEWORK

2.5. The legal framework for the determination of fees in Jamaica is based on the following:

The Telecommunications Act 2000, Part IV, Section 23 (7) A person to whom a spectrum licence is granted under this section shall pay such fees as the Minister may determine by notice in writing to that person.

Section 26 (1) The Minister may impose an annual spectrum regulatory fee in accordance with this section in relation to each spectrum licence issued under this Part.

(2) The spectrum regulatory fee shall be such amount as the Minister considers necessary in order to cover the reasonable operating costs incurred by the Authority in relation to spectrum licences.

(3) The amount of the spectrum regulatory fee shall be calculated on the same basis in relation to each holder of a carrier licence and a service provider licence.

The Authority therefore under Section 21 of the Telecommunications Act 2000 shall advise the Minister in respect of the implementation and amount of fees to be charged in relation to the management of the spectrum.

The Telecommunications Act (Spectrum Regulatory Fees) (Amendments) Regulations, 2017 provides the legal framework for the determination of regulatory fees in respect of each spectrum licence issued by the Authority.

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Section 3

Mobile Service (MS)

The following frequency bands utilized for mobile services in Jamaica were reviewed by the Consultants and the stated recommendations made.

Access Spectrum: 700 MHz, 850 MHz, 900 MHz, 1800 MHz, 1900 MHz and 1700/2100 MHz (AWS)

3.1. Recommendation

Band	Price per MHz per population (US\$)	Price per MHz (US\$)
700 MHz	0.024	69,600
850 MHz	0.013	38,280
900 MHz	0.012	34,800
1800 MHz	0.010	27,840
1900 MHz	0.012	34,800
1700/2100 MHz (AWS)	0.017	48,720

3.2. Benchmarking Exercise

To establish the market value of spectrum in Jamaica for the frequency bands listed in the table above, the Consultants made use of a wide range of evidence from other jurisdictions, with particular emphasis on:

- Prices paid in spectrum auctions; and,
- Studies on spectrum value by consultants, regulators, academics, etc.

The findings were based primarily on the Consultants' analysis of data from auctions of radio spectrum in the listed bands and in comparable frequency bands. The Consultants then cross-check their findings with results from similar studies conducted in other jurisdictions.

3.3. It is widely established that spectrum prices set through an effective and competitive auction process provide the clearest indication of market value. For that reason, the Consultants relied on auction outcomes to guide the pricing exercise. Spectrum awards data was used from the *PolicyTracker*¹ (PT) database, which included information from 62 countries worldwide. Country-specific economic and demographic data from the World Bank's World Development Indicators (WDI) database and from the Economist Intelligence Unit (EIU) database was also utilized.

¹ An independent company with a mission to explore the latest debate in spectrum management and policies that have been publishing the only newsletter devoted to the subject since 2004.

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Normalization of Data Utilized

3.4. In normalizing the data obtained from other jurisdiction, the Consultants did the following:

- Accounted for differences in license duration by converting all prices into the equivalent value for a 15-year licence tenure;
- Accounted for currency differences and for inflation by using prices expressed in United States dollars in 2019 terms from the PT database;
- Accounted for levels of affluence by using Gross Domestic Product (at Purchasing Power Parity) per capita from the WDI database;
- Accounted for the changing market circumstances by excluding auction prices that are more than 10 years old; and,
- Analyzed all prices on a “per MHz per capita” and on a “per MHz per unit of GDP per capita, PPP”

3.5. In conducting the benchmarking exercise, the Consultants started out with a preference for benchmarking against countries with similar characteristics to Jamaica e.g. population density, GDP per capita and mobile penetration. The greatest significance was assigned to spectrum prices in neighbouring Caribbean countries. However, as there is limited auction data and particularly so in the Caribbean, the analysis was expanded to include comparable non-Caribbean countries within the ITU’s Region 2 (the Americas), and then into jurisdictions outside of the Americas.

3.6. To complete the Jamaican pricing table, the Consultants relied on the price relativities observed from the auction data overall and observed from publicly available auction statistics provided by the Organization for Economic and Cooperative Development.

3.7. Relative Price by Band

Bands	Relative Price
700 MHz – 900 MHz	100%
1800 MHz – 1900 MHz	45%
AWS	100%
Above 2.1 GHz	15%

3.8. Reconciliation of Relative Prices by Band

The reconciliation table below illustrates that the price relativities arrived at for these studies were compatible to similar studies conducted by the Bahamas and the United Kingdom (UK).

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Bands	Results of Jamaica's Study	Results of Bahamian Study	Results of UK's Study
700 MHz – 900 MHz	100%	100%	100%
1800 MHz – 1900 MHz	45%	40%	Auction: 55%-100%
AWS	100%		Renewal: 43%
Above 2.1 GHz	15%	10%	

Finally, the Consultants smooth the results and based on the findings, the recommendations are as summarized below.

3.9. Recommendation

Band	Price per MHz per population (US\$)	Price per MHz (US\$)
700 MHz	0.024	69,600
850 MHz	0.013	38,280
900 MHz	0.012	34,800
1800 MHz	0.010	27,840
1900 MHz	0.012	34,800
1700/2100 MHz (AWS)	0.017	48,720

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Section 4

This section looks at the recommended changes for Fixed Services for the stated bands.

Fixed Service(FS): In reviewing the algorithm used in determining fees for fixed services, the Consultants referred to guidance from Ofcom², which states: “The algorithm is not (and cannot be) based on a precise set of engineering and/or economic relationships, but rather is intended to provide appropriate incentives for efficient spectrum use.”

- *Point to Point:* 5GHz, 6 GHz, 7 GHz, 8 GHz, 11 GHz, 13 GHz, 15 GHz, 18 GHz and 23 GHz
- *Point to Multipoint:* 5 GHz, 2.5/2.6 GHz, 3.5 GHz and 10.5 GHz

4.1. Recommendation – Point to Point (PtP)

The Consultants reviewed the following algorithm used to calculate PtP fees:

$$\text{Annual Spectrum Licence Fee} = (\text{Base Fee} * \text{BW} * \text{BD} * \text{Z} * \text{P} * \text{E} * \text{T}) / \text{Y}$$

- Where: BW is Bandwidth factor
 BD is Frequency Band factor
 Z is Zone factor
 P is Network Type factor
 E is Exclusivity factor
 T is License Tenure factor
 Y is number of years

The recommendation was as follows for PtP:

The factors highlighted are those with recommended change and are discussed in this section.

Parameters	Current Value/Range	Proposed Value/Range
Base Fee	Varies between \$100,000 and \$2,000,000	Values per MHz are <ul style="list-style-type: none"> • \$20,000 for 0-50 MHz • \$15,000 for 51-100 MHz • \$10,000 above 100 MHz
Bandwidth factor	Bandwidth/3.5, rounded up	Bandwidth
Frequency Band factor	Values are <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz • 1.00 for 10.150 – 10.650 GHz • 0.80 for 10.700 – 11.700 GHz • 0.60 for 12.750 – 15.350 GHz • 0.40 for 17.700 – 23.600 GHz • 0.20 for above 24.250 GHz 	Values are <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz • 1.00 for 10.150 – 10.650 GHz • 0.80 for 10.700 – 11.700 GHz • 0.60 for 12.750 – 15.350 GHz • 0.40 for 17.700 – 23.600 GHz • 0.20 for above 24.250 GHz

² Ofcom is the UK’s communication regulator.

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Parameters	Current Value/Range	Proposed Value/Range
Zone factor	Values are <ul style="list-style-type: none"> 0.10 for Zone 1 0.06 for Zone 2 0.04 for Zone 3 	Values are <ul style="list-style-type: none"> 0.10 for Zone 1 0.06 for Zone 2 0.04 for Zone 3
Network Type factor	Values are <ul style="list-style-type: none"> 1.00 for Private networks 2.00 for Commercial networks 	Values are <ul style="list-style-type: none"> 0.50 for Private networks 1.00 for Commercial networks
Exclusivity factor	Values are <ul style="list-style-type: none"> 1.00 for Exclusive use 0.50 for Shared use 	Values are <ul style="list-style-type: none"> 1.00 for Exclusive use 0.50 for Shared use
License Tenure factor	Values are <ul style="list-style-type: none"> 1.00 for 5 years 1.80 for 10 years 2.60 for 15 years 	Values are <ul style="list-style-type: none"> 1.00 for 5 years 1.70 for 10 years 2.20 for 15 years
Efficiency factor	N/A	Values are <ul style="list-style-type: none"> 1.00 for Category 1 0.75 for Category 2
Inflation factor	N/A	Values are as published by the Statistical Institute of Jamaica

4.1.1. Base Fees

The Consultants in conducting the review, observed that there are certain fixed service bands that have the potential for use as mobile service, and as such utilized auction data to give an indication of the value of the band for mobile use. Presented in the following table are their estimated value according to auction results from the PT database, along with spectrum values derived from similar exercises conducted in other jurisdictions.

Price per MHz per Population by Region (US\$/MHz/Population)

	Americas	Canada	USA	Africa, Middle East	Asia, Asia Pacific	Europe
4.9 GHz	-	-	-	-	0.0063	-
24 GHz	-	-	0.0010	-	-	-
26 GHz	-	-	-	-	-	0.0003

The auction data for these bands suggests that the opportunity cost of spectrum in the 23 GHz band is approximately J\$30,000 – J\$60,000.

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The Consultants also considered the base fees (rounded to the nearest US\$100) for a sample of international jurisdictions in arriving at the recommendation.

4.1.2. Bandwidth Factor

The Consultant recommended setting the bandwidth factor equal to the bandwidth amount. This helps to discourage hoarding of the spectrum.

4.1.3. Network Type Factor

The Consultant recommended recalibrating this factor to clarify that a 50% discount has been applied to Private networks. The base fee was adjusted so that the recommended change, after accounting for the change in base fee, is zero.

Network Type	Current Factor	Recommended Factor
Commercial	2.00	1.00
Private	1.00	0.50

4.1.4. Tenure Factor

To further incentivize the efficient use of the spectrum, the Consultant recommended the following change.

Tenure	Current Factor	Recommended Factor
5 years	1.00	1.00
10 years	1.80	1.70
15 years	2.60	2.20

4.1.5. Efficiency Factor

The efficiency factor is a new factor, and serves as an incentive for the use of more efficient technologies. The introduction of this factor encourages responsiveness to technological developments within the industry that promotes efficient use of the spectrum.

Parameters	Current Value/Range	Proposed Value/Range
Efficiency factor (New Factor)	N/A	Values are <ul style="list-style-type: none"> • 1.00 for Category 1 • 0.75 for Category 2

Category 1 as proposed, represents the standard or non-discount category. Category 2, represents the discount category.

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The SMA is proposing the following factors for discussion in determining the requirements for operators to be in Category 2.

- **Polarization Factor** – This refers to whether the link operates using a single polarization (Vertical or Horizontal) or dual polarization (Vertical and Horizontal). Dual polarization is considered to be more efficient than single polarization. The SMA is proposing the use of dual polarization to qualify to be in category 2.

- **Antenna Performance Factor**
This refers to how efficiently the antenna operates. That is, with low side lobes and/or high front to back ratio. A high performance antenna is more efficient than a standard parabolic. Similarly, an ultra-high performance antenna is more efficient than a high performance antenna. The SMA is proposing a minimum of a high performance antenna to qualify to be in category 2.

- **Frequency Re-use Factor**
This factor relates to how often a frequency pair is used throughout the network. It is encouraged to reuse frequency as often as is possible. Whereas the SMA is keen on using this factor as well, there is the challenge of determining the maximum level of re-use possible and hence to be able to set a percentage to qualify to be in category 2. Participants of this consultative process are asked to make recommendation on how best this factor may be used or propose any other factor giving justification and recommending the qualifying mark to be a part of category 2.

Finally, the SMA will then propose, based on the factors to be used, the compliance rate to qualify to be in category 2. That is, if only 3 factors are identified to be used, the SMA will determine if operators need to be meeting all 3 requirements or any 2 of the 3, to be in category 2.

4.1.6. Inflation Factor

This factor is intended to take into consideration inflationary conditions within the market place which impacts the operations of the SMA, and will be applied based on Consumer Price Index.

4.2. Recommendation – Point to Multi-Point (PtMP)

The Consultants reviewed the following algorithm used to calculate PtMP fees:

$$\text{Annual Spectrum Licence Fee} = (\text{Base Fee} * \text{BW} * \text{BD} * \text{Z} * \text{P} * \text{E} * \text{T}) / \text{Y}$$

Where: BW is Bandwidth factor
BD is Frequency Band factor
Z is Zone factor
P is Network Type factor
E is Exclusivity factor
T is License Tenure factor
Y is the number of years

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The recommendation was as follows for PtMP:

The factors highlighted are those with recommended change and are discussed in this section

Parameter	Current Value/Range	Proposed Value/Range
Base Fee (Proposed Change)	Bands using 5MHz Channel Plans	
	Bandwidth	Base Fee (J\$ Million)
	2 x 5	2
	2 x 10	4
	2 x 15	6
	2 x 20	8
	2 x 25	10
	Bands using 3.5MHz Channel Plans	
	Bandwidth	Base Fee (J\$ Million)
	2 x 3.5	2
	2 x 7	4
2 x 14	6	
2 x 28	8	
2 x 56	10	
Base Fee (Proposed Change)	J\$350,000.00 per MHz	
Bandwidth Factor (Proposed Change)	Bandwidth / 3.5, Rounded up	Bandwidth
Frequency Band Factor	Values are: <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz • 1.00 for 10.150 – 10.650 GHz • 0.80 for 10.700 – 11.700 GHz • 0.60 for 12.750 – 15.350 GHz • 0.40 for 17.700 – 23.600 GHz • 0.20 for above 24.250 GHz 	Values are: <ul style="list-style-type: none"> • 1.80 below 4.2 GHz • 1.60 for 5.925 – 7.125 GHz • 1.40 for 7.110 – 7.725 GHz • 1.20 for 7.725 – 8.500 GHz • 1.00 for 10.150 – 10.650 GHz • 0.80 for 10.700 – 11.700 GHz • 0.60 for 12.750 – 15.350 GHz • 0.40 for 17.700 – 23.600 GHz • 0.20 for above 24.250 GHz
Zone Factor (Proposed Change)	Values are <ul style="list-style-type: none"> • 0.10 for Rural Only Services • 0.20 for Island Wide Services • 0.25 for Urban Services 	Values are <ul style="list-style-type: none"> • 0.04 for Rural Only Services • 0.06 for Island Wide Services • 0.10 for Urban Services
Network Type Factor (Proposed Change)	Values are <ul style="list-style-type: none"> • 1.00 for Private Networks • 2.00 for Commercial Networks 	Values are <ul style="list-style-type: none"> • 0.50 for Private Networks • 1.00 for Commercial Networks
Exclusivity Factor (No Change)	Values are <ul style="list-style-type: none"> • 1.00 for Exclusive Use • 0.50 for Shared use 	Values are <ul style="list-style-type: none"> • 1.00 for Exclusive Use • 0.50 for Shared use
License Tenure Factor (Proposed Change)	Values are <ul style="list-style-type: none"> • 1.00 for 5 years • 1.80 for 10 years • 2.60 for 15 years 	Values are <ul style="list-style-type: none"> • 1.00 for 5 years • 1.70 for 10 years • 2.20 for 15 years
Efficiency Factor (New Factor)	N/A	Values are <ul style="list-style-type: none"> • 1.00 for Category 1

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Parameter	Current Value/Range	Proposed Value/Range
		<ul style="list-style-type: none"> 0.75 for Category 2
Inflation Factor (New Factor)	N/A	Values are as published by the Statistical Institute of Jamaica

4.2.1. Base Fees

The Consultants in conducting the review, observed that there are certain fixed service bands that have the potential for use as mobile service, and as such utilized auction data to give an indication of the value of the band for mobile use. Presented in the following table are their estimated value according to auction results from the PT database, along with spectrum values derived from similar exercises conducted in other jurisdictions.

Price per MHz per Population by Region (US\$/MHz/Population)

	Americas	Canada	USA	Africa, Middle East	Asia, Asia Pacific	Europe
2.3 GHz	-	-	-	-	0.0063	-
2.6 GHz	0.0024	-	0.0010	-	-	-
3.5 GHz	-	-	-	-	-	0.0003

The auction data for these bands suggests that the opportunity cost of spectrum in the 2.6 GHz band is approximately J\$400,000.

The Consultant recommended a base fee of J\$350,000 per MHz.³

4.2.2. Bandwidth Factor

The Consultant recommended setting the bandwidth factor equal to the bandwidth amount. This helps to discourage hoarding of the spectrum.

4.2.3. Zone Factor

The Consultant recommended the following changes in recognition that these zone factors are different from those used in the point to point pricing as, in this case, the type/coverage of service (i.e. rural, urban or island-wide) rather than the path (i.e. the location of the start and end point of each link) is of concern.

Zone	Current Factor	Recommended Factor
Zone 1 - urban	0.25	0.10
Zone 2 - island wide	0.20	0.06
Zone 3 - rural	0.10	0.04

³ This base fee includes an adjustment by a factor of 5/3.5 to account for revisions to the zone factor, bandwidth factor and network type factor.

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4.2.4. Network Type Factor

The Consultant recommended recalibrating this factor to clarify that a 50% discount has been applied to Private networks. The base fee was adjusted so that the recommended change, after accounting for the change in base fee, is zero.

4.2.5. Licence Tenure Factor

To further incentivize the efficient use of the spectrum, the Consultant recommended the following change.

Tenure Factors

Tenure	Current Factor	Recommended Factor
5 years	1.00	1.00
10 years	1.80	1.70
15 years	2.60	2.20

4.2.6. Efficiency Factor

The efficiency factor, serves as an incentive for the use of more efficient technologies. The introduction of this factor encourages responsiveness to technological developments within the industry that promotes efficient use of the spectrum.

Parameters	Current Value/Range	Proposed Value/Range
Efficiency factor (New Factor)	N/A	Values are <ul style="list-style-type: none"> • 1.00 for Category 1 • 0.75 for Category 2

The SMA has not yet determine the factors to be used for qualifying to be in category 2, and as such are asking participants of this consultative process to make proposals of factors that may be used. Proposals should be justified and include qualifying mark to be a part of category 2.

4.2.7. Inflation Factor

This factor is intended to take into consideration inflationary conditions within the market place which impacts the operations of the SMA, and will be applied based on Consumer Price Index.

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Section 5

Fixed Satellite Service

5.1. Recommendation: Fixed Satellite Services

The recommended fee structure for fixed satellite services spectrum licence fee, has moved from a fixed per terminal fee to a two (2) tiered system with 2 categories of service, starting with a minimum flat fee then per terminal when the minimum is exhausted, for both categories of service, as illustrated below:

VSAT Spectrum Fees

Current Fees	Recommended Fees		
Annual Spectrum Fee J\$	Number of VSAT terminals	Annual Spectrum Fee (J\$)	
\$500,000 per Terminal		Direct to Business (DTB)*	Direct to Home (DTH)*
	Up to 30	\$200,000	\$150,000
	More than 30	\$6,500 per terminal	\$5,000 per terminal

* A spectrum licence fee discount of 50% applicable to terminals installed in businesses, homes and special targeted groups (Police Stations, Hospitals, Health Centers, Youth Clubs, Schools, Libraries) located in rural unserved and underserved communities across the island. The desired outcome is that this rebate will be applied in such a way that the regulatory fee is calculated before the spectrum licence fee rebate is applied.

5.2. Consultant Recommendation

The Consultants' recommendation was as follows:

Number of terminals	Annual Spectrum Fee (J\$)
Up to 30	\$200,000
More than 30	\$6,500 per terminal

In arriving at the recommendations, the Consultants reviewed the following:

- the spectrum licence fees charged for VSAT by the largest (population) English-speaking countries in the Caribbean;
- spectrum licence fees charged in countries outside of the Caribbean; and,
- Examined the algorithm utilized by the UK.

Based on the observation, the consultants recommended:

- Reducing Jamaica's spectrum fee to a level that is closer to the low/middle end of the range;
- Expanding the fee structure to accommodate VSAT networks, in addition to single terminals; and,
- Keeping the new fee structure as simple as possible.

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5.3. Final Recommendation

Further to the review of the Consultants' recommendation, the SMA after taking on-board the Consultants' recommendation deemed it important for consideration, the categorizing of the services to be provided – Direct to Business and Direct to Home. Additionally, the SMA is putting forward for consideration a 50% discount at this time for installations at businesses and homes located in communities classified by the SMA as underserved and/or unserved. This discount is targeted to be applied to the spectrum licence fee only, after the regulatory has determined on the original spectrum licence fee.

The SMA's additional recommendation takes into consideration the Universal Access objective of the Government of Jamaica, and the sudden need to adjust the way of life for all Jamaicans, in business and at home, based on the COVID-19 pandemic. As such these additional measures are intended to facilitate this transition.

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ANNEX 1

Responding to this consultation

How to respond

A1.1 The SMA invites responses on this Consultative Document, to be made by 1 pm on 2020 July 17.

A1.2 The SMA strongly prefers to receive responses as e-mail attachments, in Microsoft Word format, as this helps us to process the responses quickly and efficiently.

A1.3 Responses to this consultation should be submitted to the address below, and clearly marked with the title of the consultation, “**Revision of Spectrum Pricing**”.

**The Managing Director
Spectrum Management Authority
13-19 Harbour Street
Kingston
consultation@sma.gov.jm**

A1.4 To assist the SMA’s processing of the responses, respondents are requested, as far as possible, to follow the order of the sections and recommendations. Respondents may also only respond to specific sections of the Consultative Document - a failure to respond to all sections will in no way reduce the consideration given to the response.

A1.5 To assist the SMA’s processing of the responses, it would be helpful if respondents include the section and numbered area commenting on. It would also help if respondents provide written explanation for the responses provided.

Confidentiality

A1.6 The SMA believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. The SMA therefore intends to publish all submissions on our website, www.sma.gov.jm, ideally on receipt, including any personal information contained in the submission (such as names and contact details of submitters). Any information claimed (and the SMA has accepted) to be confidential, will not be published or otherwise released unless required or authorized by law.

A1.7 All comments will be treated as non-confidential unless respondents specify that part or all of the response is confidential (and the SMA has accepted), and should not be disclosed. Please place any confidential parts of a response in a separate annex so that non-confidential parts may be published along with the respondent’s identity.

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Next steps

A1.8 After receiving submissions on 2020 July 17, the SMA will respond to the submissions by 2020 July 24, requesting further consultation by 2020 July 31. Following the end of that consultation period, the SMA intends to submit its recommendation to the MSET by 2020 August 14.

Disclaimer

A1.9 The material in this report is of a general nature and should not be regarded as legal advice or relied on for assistance in any particular circumstance or emergency situation. In any important matter, you should seek appropriate independent professional advice in relation to your own circumstances. The SMA accepts no responsibility or liability for any damage, loss or expense incurred as a result of the reliance on information contained in this report.

This report has been prepared for consultation purposes only and does not indicate the SMA's commitment to a particular course of action. Additionally, any third party views or recommendations included in this report do not reflect the views of the SMA, or indicate its commitment to a particular course of action.