Office of Utilities Regulation

Review of the International Mobile Subscriber Identity (IMSI) Assignment Guidelines

Consultation Document

OFFICE OF UTILITIES REGULATION

2022 December 09

Abstract

Advances in telecommunication technology have had a profound impact on the industry and has served to blur the lines between previous network siloes for different services. As networks evolve and can provide services using a converged network platform there arises a need for reconsideration of previous regulatory arrangements for items such as telecommunications numbering resources.

One such example has been the International Mobile Subscriber Identity (IMSI) resource and its possible use as an identifier for subscribers seeking to access services other than mobile services. The issue has arisen due to the emergence of modern telecommunication networks such as Long-Term Evolution (LTE) networks that can support the delivery of converged services. The ability of networks to support the delivery of both fixed and mobile service offerings has resulted in IMSIs being used in a manner that was not contemplated at the time the existing IMSI Assignment Guidelines were drafted.

Consequently, the Office of Utilities Regulations (OUR) has decided to review the current IMSI Assignment Guidelines to ensure that they address the needs of the sector and support critical national development goals such as increased broadband access.

Consultation Process

Persons who wish to express opinions on this Consultation Document are invited to submit their comments in writing to the Office of Utilities Regulation ("OUR") by post, delivery, facsimile or email addressed to:

Office of Utilities Regulation
P.O Box 593
36 Trafalgar Road
Kingston 10

Attention: Gordon M Swaby

Fax: (876) 929 3635
Email: JNAD@our.org.jm

Responses are requested by 2023 January 12.

Any confidential information should be submitted separately and clearly identified as such. The submission of confidential information should be accompanied by a detailed justification in keeping with section 7(6) of the Telecommunications Act.

Responses that are not confidential, pursuant to sections 7(6) and 7A of the Telecommunications Act, will be posted to the OUR's website (http://www.our.org.jm/). Respondents are therefore requested, where possible, to supply their responses in electronic form to facilitate such postings.

Comments on Responses

The OUR's intention in issuing this Consultation Document is to stimulate public debate. The responses to this Consultation Document are a vital part of that public debate. There will therefore be a specific period for respondents to view other responses (non-confidential) and to make comments on them. The comments on responses may take the form of either correcting a factual error or putting forward counterarguments and/or providing relevant data in support of an argument or counterargument. As in the case of the responses, comments which are not confidential pursuant to the Telecommunications Act will be posted to the OUR's website.

Comments on responses are requested by 2023 January 27.

Consultation timetable

The timetable for this consultation is summarised below.

Event	***Date***
Publish Consultation Document	2022 December 9
Receive Responses to Consultation	By 2023 January 12
Receive Comments on Responses	By 2022 January 27
Issue Determination Notice	By 2023 July 31

Glossary

In this document, unless the context otherwise requires, the following terms will have the meanings specified below:

1. The ‘Act” means the Telecommunications Act.
2. “Fixed Wireless Access (FWA)” refers to the use of fixed or nomadic radios to provide access to a public telecommunications network for the provision of voice and/or data services. These systems may also provide services for private networks.
3. “International Mobile Subscriber Identities (IMSI)” means a string of decimal digits, up to a maximum length of 15 digits, which identifies a unique subscription.
4. “Licensee” has the same meaning as in the Act.
5. “OUR Act” means the Office of Utilities Regulation Act
6. “Roaming” means the ability for a customer to automatically make and receive voice calls, send and receive data, or access other mobile services while visiting another country, by means of using the infrastructure of a “visited” network.
7. “Service Provider” has the same meaning as in the Act.

Abbreviations

ARCEP	L'Autorité de régulation des communications électroniques, des postes et de la distribution de la presse (French Regulatory Authority for Electronic Communications, Postal and Print Media Distribution)
BEREC	Body of European Regulators for Electronic Communications
CEPT	European Conference of Postal and Telecommunications Administrations (CEPT)
eSIM	Embedded SIM
GSMA	Global System Mobile (GSM) Association
IMSI	International Mobile Subscriber Identity
ITU	International Telecommunication Union
MCC	Mobile Country Code
MNC	Mobile Network Code
MNO	Mobile Network Operator
SIM	Subscriber Identity Module

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Chapter 1: Introduction

1.1 Background

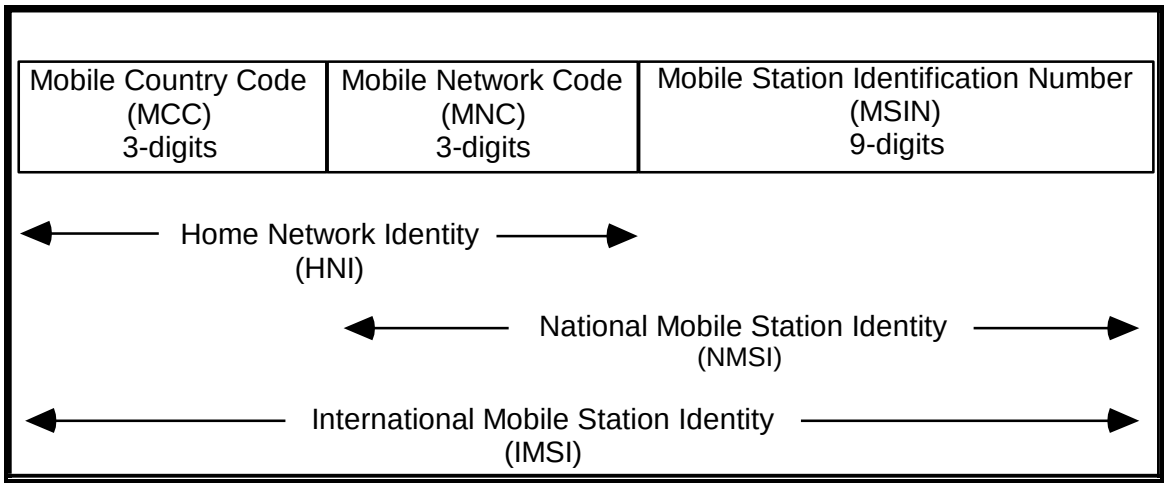
1.1.1 Pursuant to Section 8 of the Telecommunications Act (Act) the Office of Utilities Regulation (OUR) has statutory responsibility for the assignment of telecommunication resources within Jamaica. As a part of these responsibilities, the OUR is tasked with the development of a numbering plan and to make rules based on that plan.

1.1.2 This resulted in the OUR developing and publishing the Jamaica National Numbering Plan (JNNP) in 2003 and subsequently the Jamaican National Numbering Rules. Following the publication of these documents, the OUR also published several subsidiary documents, called "Assignment Guidelines", to govern the assignment of the different numbering resources that are administered by the OUR. One such document is the Jamaican International Mobile Subscriber Identities (IMSI) Assignment Guidelines which was published in 2007 January 31.

1.1.3 The ITU defines the IMSI as "a string of decimal digits, up to a maximum length of 15 digits, which identifies a unique subscription".[1] The IMSI consists of three fields. The first field of an IMSI (three digits) represents the Mobile Country Code (MCC), which is an E.212 resource assigned by the ITU, and which identifies a country. The second field represents the Mobile Network Code (MNC) which can be two or three digits (three digits in the case of the North American standard which Jamaica follows). The MNC is assigned by the respective national numbering plan administrator and identifies a particular network within a country. The third field of an IMSI is the mobile subscription identification number (MSIN). The MSIN is administered by an MNC assignee to identify individual subscriptions on its network.

[1] International Telecommunication Union (2016). Recommendation ITU-T E.212: The International Identification Plan for Public Networks and Subscriptions. https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-E.212-201609-I!!PDF-E&type=items. In force as at 09/2016.

Figure 1: Format of the IMSI in Jamaica



Source: OUR

1.1.4 Under Jamaica's current numbering regulatory framework, the resources required to construct IMSIs can only be assigned to a public network operator offering public mobility services with international roaming i.e., an entity licensed to own or operate a mobile network.

1.1.5 To ensure continued relevance of the overall numbering regime developed for Jamaica, OUR issued a Consultation document on 2019 July 22 entitled "*Review and Revision of the Jamaican National Numbering Plan & The Telecommunications Numbering Rules Phase 1 (Document Number 2019/TEL/004/CON.002)* (hereafter the Consultation Document)*"*.[2] The Consultation Document involved the review of numbers by allocation categories and proposed changes based on domestic and international developments.[3]

1.1.6 The Consultation Document included a proposal for the amendment of the Numbering Plan to adopt Recommendation ITU-T E.212, Edition 6.0 (hereafter "the Recommendation").[4] One of the amendments made to Recommendation ITU-T E.212 since the publication of the IMSI Guidelines in 2007, extended the eligibility criteria for the assignment of MNCs to include operators of networks other than mobile networks. In this regard, the OUR proposed that MNCs be assigned for use in fixed networks given the following statement in the Recommendation:

[2] Office of Utilities Regulation. Review and Revision Jamaican National Numbering Plan & The Telecommunications Numbering Rules. https://our.org.jm/wp-content/uploads/2021/05/Review-and-Revision-of-Jamaican-National-Numbering-Plan-and-Telecommunications-Numbering-Rules-Phase-1-2019.pdf

[3] The consultation document also discussed the formal incorporation of the various numbering decisions issued by the OUR since 2003 into the revised JNNP and Numbering Rules documents.

[4] https://www.itu.int/rec/dologin_pub.asp?lang=e&id=T-REC-E.212-201609-I!!PDF-E&type=items. In force as at 09/2016

"*Recommendation ITU-T E.212 now defines a unique international identification plan for both public fixed and mobile networks providing users with access to public telecommunication services.*

1.1.7 Annex F of the Recommendation, indicated the following uses of the E.212 identification resource in fixed networks (PSTNs):

- aspects of personal mobility whereby a user may move between compatible terminals and retain its subscribed access to service;
- the authentication and verification of a user request for service that may be used on the basis of manual entry or automated reading device;
- fixed networks emulating applications of the cellular mobile networks such as SMS or TEXT messaging;
- interaction between users of fixed and mobile networks.

1.1.8 The OUR also proposed that a separate MCC+MNC be assigned to fixed and mobile networks.

1.1.9 The OUR received responses on its proposal for the use of IMSIs within the fixed network from Digicel Jamaica Limited (Digicel) and Consumer Advisory Committee on Utilities (CACU). Digicel in its response, stated that while the inclusion of a statement in principle in JNNP regarding the OUR's intent to accommodate the assignment of for use of IMSI within the fixed network would give regulatory guidance to developers of new services, there should be further consultation before any such assignment is made.[5] The company further stated that it agreed with the OUR's proposal to assign separate MCC+MNC resources to fixed and mobile networks. CACU in its response, noted that the consultation did not provide a clear basis for the use of IMSIs within the fixed network.[6]

1.1.10 The OUR considered the stakeholders' feedback on the proposal and in its Determination Notice entitled Review and Revision of the Jamaican National Numbering Plan and Dialling Plan & The Telecommunications Numbering Rules – Determination Notice and

[5] Digicel. *Digicel's Response to the Consultation by the Office of Utilities Regulation on The Review and Revision of the Jamaican National Numbering Plan & the Telecommunications Numbering Rules*. Retrieved from https://our.org.jm/wp-content/uploads/2021/05/digicel_response_-_review_revision_of_numbering_plan_30-8-19.pdf

[6] CACU. CACU Response to OUR Consultation Document on Review and Revision OF THE Jamaican National Numbering Plan & The Telecommunications Numbering Rules-Phase 1. https://our.org.jm/document/cacus-response-to-review-revision-of-the-jamaican-numbering-plan-telecommunications-numbering-rules-2019-aug-9/

published on 2020 May 26, indicated that it would conduct further consultation on the issue.[7]

1.2 Need to Increase Access to Broadband

1.2.1 The advent of the Covid pandemic highlighted the importance of broadband access to the daily lives of citizens globally. Prior to the start of the pandemic, internet traffic growth was estimated to have a compound annual growth rate (CAGR) of 30% for the period of 2017 to 2022.[8] However, in a 2020 July publication, the International Telecommunication Union (ITU) noted that due to the prophylactic measures taken to deal with the pandemic, global Internet traffic had increased by approximately 30%.[9] The ITU also noted that some experts consider that the overall increase in network traffic will become a fixture of the future.[10] Figure 2 below shows examples of the data increase compiled from telecommunication operators and OTT platforms.

Figure 2: Internet Usage Increase Triggered by Covid-19 (Examples)

Area	Service provider	Area of usage percent increase	Source
Telecommunication traffic	AT&T (US)	Core network traffic (22%)	AT&T
	British Telecom (UK)	Fixed network traffic (60% on weekdays)	British Telecom
	Telecom Italia (Italy)	Internet traffic (70%)	Telecom Italia
	Vodafone	Mobile data traffic in Italy and Spain (30%)	Vodafone
Over The Top	Facebook	Facebook Messenger (50%)	Facebook
		WhatsApp (Overall: 50%; Spain: 76%)	WhatsApp
		Video calling (100%)	Facebook
	Netflix	Subscriber base (9.6% or 16 million)	Netflix
	E-commerce (Mexico)	Number of Users (8%)	Competitive Intelligence
Video conferen	Zoom	Daily usage (300%)	JP Morgan
	Cisco Webex	Subscribers (33%)	Cisco
	Teams (Italy)	Monthly users (775%)	Microsoft

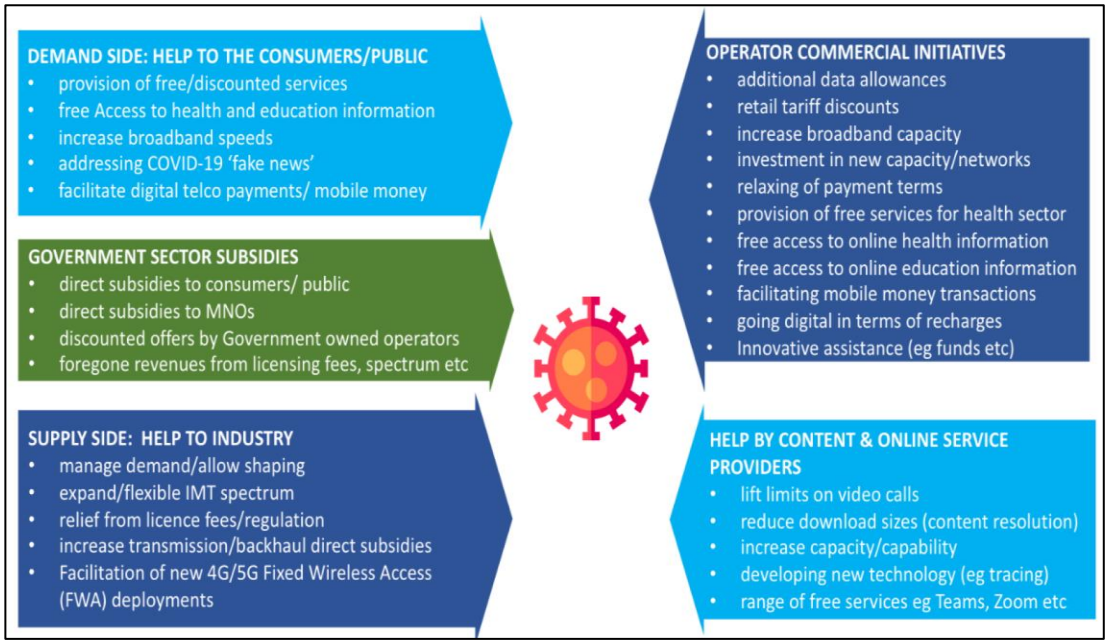
Source: ITU GSR-20

[7] Office of Utilities Regulation (2020). The Jamaican National Numbering Plan and Dialling Plan & The Telecommunications Numbering Rules Determination Notice (Document Number 2020/TEL/006/DET.002).
[8] Cisco (2022). Virtual Networking Index Complete Forecast Highlights. https://www.cisco.com/c/dam/m/en_us/solutions/service-provider/vni-forecast-highlights/pdf/Global_2022_Forecast_Highlights.pdf
[9] ITU (2020) Economic Impact of Covid-19 on Digital Infrastructure - Report of an Economic Experts Roundtable https://www.itu.int/en/ITU-D/Conferences/GSR/2020/Documents/GSR-20_Impact-COVID-19-on-digital-economy_DiscussionPaper.pdf

[10] Ibid

1.2.2 Noteworthy was that even as internet traffic increased globally, the global internet penetration rate is estimated to be 62.5%.[11] Locally the fixed subscription penetration rate is 17.3% while the mobile broadband subscription penetration rate is 64%.[12] It is therefore imperative that various mechanisms be used to facilitate the deployment of telecommunication networks to ensure access for persons that presently do not have access internet services. The ITU has highlighted several demand side and supply side measures that regulators and governments could take, in light of the pandemic, to bolster access to internet services (see Figure 3 below).[13] The facilitation of new 4G/5G Fixed Wireless Access (FWA) deployments is identified as a key supply-side measure.

Figure 3: ITU - Best Practice in Relation to Emergency Measures During Covid-19



Source: ITU

1.2.3 Given the cost of deploying wired fixed networks, new entrants in the fixed segment of telecommunications sectors globally, have been utilizing fixed wireless access networks and satellite-based networks as more cost-effective alternatives. During 2020 and 2021,

[11] Statista. Internet and social media users in the world 2022 | Statista. Accessed 2022 November 11.
[12] Office of Utilities Regulation (2022). Telecommunications Market Information Report January – March 2022. https://our.org.jm/wp-content/uploads/2022/08/Telecommunications-Market-Information-Report-January-March-2022-1.pdf.
[13] Office of Utilities Regulation (2020). Pandemic in the Internet Age: Communication Industry Responses. https://reg4covid.itu.int/wp-content/uploads/2020/06/ITU_COVID-19_and_Telecom-ICT.pdf

the OUR saw a notable increase in applications for licences to provide internet services to the public (see Table 1). Most of those applicants indicated that they will utilize fixed wireless access networks or satellite-based networks to deliver the service. Some of the applicants, also raised the issue of the use of IMSIs within such networks as a means of authenticating their subscribers.

Table 1: Number of Applications for Internet Service Provider Licence Received by the OUR 2017-2021

Period	**Number of Applications for Internet Service Provider Licence**	
	NEW	RENEWALS
2017 -2018	0	1
2018-2019	2	3
2019-2020	10	4
2020-2021	13	2
Total	25	10

Source: OUR

1.2.4 In light of the foregoing, the IMSI Assignment Guidelines are being reviewed to take account of the technological developments in the sector and to ensure that the Guidelines are facilitative of increased broadband deployment.

1.3 Structure of the Document

1.3.1 The remainder of the document is structured as follows:

- **Chapter 2** outlines the Legal Framework that underscores the remit of the OUR in relation to Numbering.
- **Chapter 3** looks at the role of fixed wireless networks as a means of supplying internet services.
- **Chapter 4** outlines the experience of other jurisdictions in assigning ITU-T E.212 identification resources to entities other than those operating public networks offering mobile services.
- **Chapter 5** outlines the proposed modifications to the Jamaican IMSI Assignment Guidelines.

Chapter 2: Legal Framework

2.1 General Provisions

<u>The Office of Utilities Regulation Act</u>

2.1.1 The OUR was established under the OUR Act with the power to regulate "prescribed utility services." Section 2 and the First Schedule of the OUR Act defines "prescribed utility services" to include "*the provision of telecommunication services.*"

2.1.2 The power and authority of the OUR to regulate the telecommunications sector is governed by the provisions of the OUR Act and the Telecommunications Act ("the Act").

2.1.3 Section 4(1) of the OUR Act permits the OUR to:

> *"…*
>
> *(c) conduct such research as it thinks necessary or desirable for the purposes of the performance of its functions under this Act;*
>
> *…*
>
> *(e) subject to section 8A carry out, on its own initiative or at the request of any person, such investigations in relation to the provision of prescribed utility services as will enable it to determine whether the interests of consumers are adequately protected."*

2.1.4 Section 4(3) of the OUR Act empowers the OUR to undertake such measures, as it considers necessary and desirable, to inter alia:

> *"(a) encourage competition in the provision of prescribed utility services;*
>
> *(b) protect the interests of consumers in relation to the supply of a prescribed utility service;*
>
> *…*
>
> *(d) promote and encourage the development of modern and efficient utility services; …"*

The Telecommunications Act

2.1.5 The Telecommunications Act also grants specific powers to the OUR to provide regulatory oversight on certain areas of focus as it relates to the provision of telecommunications services. Some of the relevant provisions of the Act are as follows:

"*3(a) to promote and protect the interest of the public by-*

(i) Promoting fair and open competition in the provision of specified services and telecommunications equipment;

(ii) Promoting access to specified services;

"*4(1) The Office shall regulate telecommunications in accordance with this Act and for that purpose the Office shall –*

(*a) regulate specified services and facilities;*

…

(d) promote the interests of customers, while having due regard to the interests of carriers and service providers;

…

(3) In exercise of its functions under this Act, the Office may have regard to the following matters –

(a) the needs of the customers of the specified services;

(b) whether the specified services are provided efficiently and in a manner

designed to –

…

(iii) afford economical and reliable service to its customers;

(c) Whether the specified services are likely to promote or inhibit competition."

2.1.6 The Act also gives the OUR regulatory responsibilities concerning the assignment of numbering resources to be used with telecommunication services. The relevant sections are as follows:

"8(1) The Office shall assign numbers for telecommunications services to carriers and service providers on a non-discriminatory basis.

(2) In carrying out its functions under this section the Office shall develop a plan for the numbering of telecommunications services and may make rules pursuant to that plan regarding the assignment and use of numbers by carriers and service providers granted under section 13.

(3) For the purpose of subsection (2) the Office shall –

(a) Take account of relevant international regulations.

(b) ensure that sufficient numbers are available for the current and reasonably anticipated future need of carriers and providers;

…

(d) Promote efficient use of numbers;

(e) Promote fair and open competition

…"

2.2 IMSI Assignment Guidelines

2.2.1 The IMSI Assignment Guidelines contain the guidelines and procedures for the assignment and use of International Mobile Subscriber Identities (IMSIs) in Jamaica.

2.2.2 Provision 1.2 states:

> "1.2. *These assignment guidelines pertain, in one section or another, to all segments of the IMSI – Mobile Country code (MCC), Mobile Network Code (MNC) and Mobile Station Identification Number (MSIN), in sequential order. The MCC is assigned by the ITU to member countries. The IMSI administrator participates in the management of all segments of the IMSI, but directly administers only the MNC segment. MNCs are assignable to operators of public networks offering public mobility services with international roaming capabilities. The MNC uniquely identifies the home network of a mobility service subscriber. The remaining segment of the IMSI, the Mobile Station Identification Number (MSIN), is directly administered by the network operator to which the MNC is assigned*".

2.2.3 Provision 3.3 of the Guidelines outlines the purposes for which the IMSI can be used:

> *"3.3. The IMSI enables mobile terminals/users to roam among public networks, domestically and internationally, by providing a uniform and unique home network and mobile terminal/user identification that is recognizable by all conforming public networks. When transmitted between visited and home networks, the IMSI enables the exchange of subscription and billing information for the visiting mobile station. Specifically, the IMSI is used for:*
>
> - *Determination of the mobile terminal's/user's home wireless network,*
> - *Mobile terminal/user identification when information about a specific mobile terminal/user is to be exchanged between visited and home networks,*

- *Mobile station identification on the radio control path for registering a mobile station in a visited wireless network,*
- *Mobile station identification for signalling on the radio control path,*
- *Identification of the mobile terminal/user to allow for charging and billing of visiting mobile terminals/users, and*
- *Subscription management, i.e., retrieving, providing, changing, and updating subscription data for a specific".*

2.2.4 Provisions 6.1 – 6.3 outline the criteria for MNC assignment. Specifically, 6.1 states:

"6.1 The MNC applicant must be, and certify that it is a public network operator offering public mobility services with international roaming for which an MNC is requested."

Chapter 3: Fixed Wireless Access Systems in the Provision of Broadband Services

3.1 Wireless Access Systems

3.1.1 The ITU defines wireless access systems as "end-user radio connections to public or private core networks". [14] One specific type of wireless access system is Fixed Wireless Access (FWA). FWA generally refers to the use of fixed or nomadic radios to provide access to a public telecommunications network for the provision of voice and/or data services. These systems may also provide services for private networks[15].

3.2 Deployment of FWA Networks and Services Globally

3.2.1 Globally, operators have shown increasing interest in using FWA networks to supply telecommunication services, especially internet services. In its June 2022 Mobility Report, Ericsson noted that the adoption of FWA service offering by service providers had more than doubled in the last three years.[16] The reasons for the increased deployment can be attributed to:

i. The increased demand for digital services that require internet connectivity;

ii. FWA, particularly those delivered by 4G/5G, being considered an "increasingly cost-efficient" alternative to the use of fibre, cable and DSL for the provision of fixed internet services in areas with limited connectivity;

iii. Increased network efficiency, measured by the cost to deliver each gigabyte, arising from advances in the technology used in FWA networks and greater spectrum allocations;

iv. The provision of specific government subsidies as programmes geared toward increasing digitalization and economic growth in various countries.[17]

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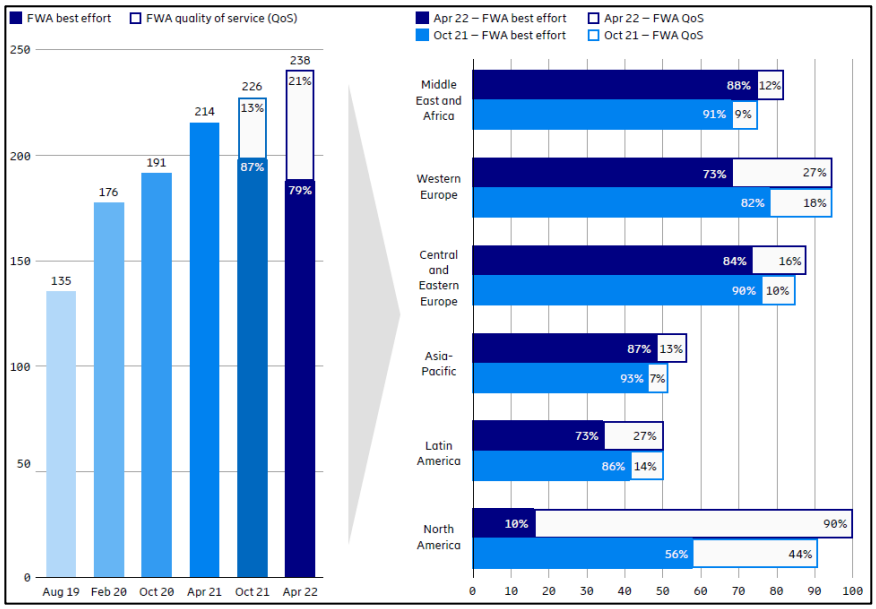
[15] Global System for Mobile Communications Association (2018). Fixed Wireless Access: Economic Potential and Best Practices. https://www.gsma.com/futurenetworks/5g/fixed-wireless-access-economic-potential-and-best-practices/

[16] Ericsson (2022). Ericsson Mobility Report. https://www.ericsson.com/49d3a0/assets/local/reports-papers/mobility-report/documents/2022/ericsson-mobility-report-june-2022.pdf

[17] Ibid

3.2.2 Figure 4 below shows the global number of service providers offering FWA and the regional percentage of service providers offering FWA for the period 2019-2022 by way of best effort and managed QoS based approaches.

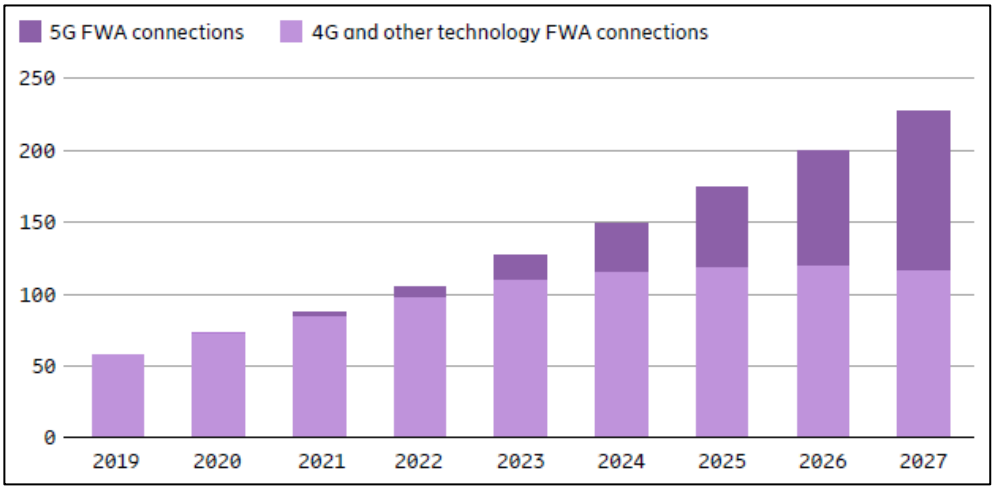
Figure 4: Global Number of Service Providers Offering FWA



Source: Ericsson

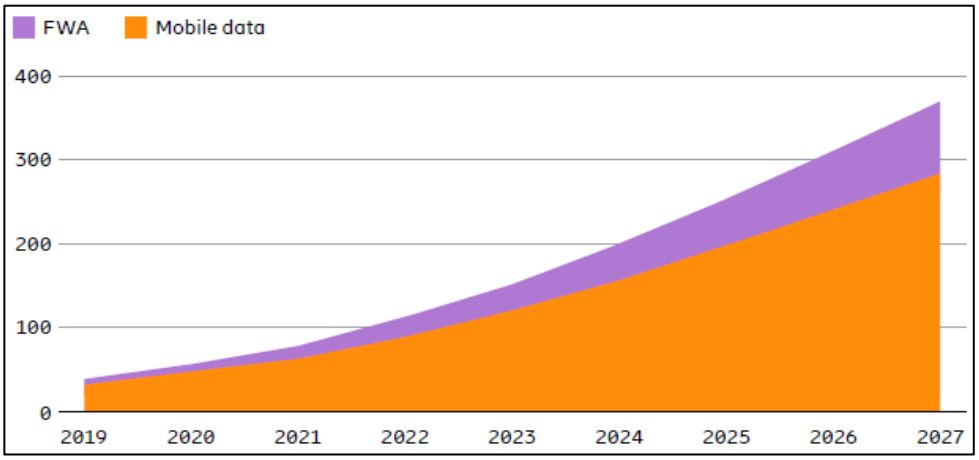
3.2.3 Ericsson also estimated that there were close to 90 million connections by the end of 2021, and that this figure will exceed 100 million during 2022. Ericsson further indicated that based on its forecast, the number of connections is expected to more than double by 2027 to reach 230 million representing 15% of all fixed broadband connections (See Figure 5). By 2027, the number of 5G FWA connections is expected to represent half of the total number of FWA connections. FWA data traffic is expected to account for approximately 25% of the total mobile data traffic globally by 2026 (See Figure 6).

Figure 5: Number of 4G/5G FWA Connections in Millions



Source: Ericsson

Figure 6: Global Mobile Network Data Traffic (EB per month)



Source: Ericsson

3.2.4 Operators with existing mobile networks tend to find it easier to deploy FWA as it offers a means of leveraging their existing network facilities. Increasingly however, providers who do not operate a mobile network are utilising mobile technology in deploying their FWA networks instead of technologies such as WIMAX which have failed to establish an equally mature ecosystem. According to GSMA, 5G NR and 4G LTE provide enhanced connectivity and allow FWA operators to address market demands which were previously economically unfeasible. The implementation of FWA using mobile technology necessitates using an IMSI for subscriber authentication and identification

on these networks. This would therefore require the assignment of E.212 resources to entities that are not licensed/authorised to operate a mobile network.

Chapter 4: Experience of Other Jurisdictions in Assigning MNCs for the Provision of Non-Mobile Services

4.1 Introduction

4.1.1 ITU-T Recommendation E.212, was developed to define a unique international identification plan for land mobile terminals in public land mobile networks and establish the principles for allocating international mobile identities to terminals in such networks. Initially the assignment of MNCs under MCCs was geared towards facilitating land mobile terminals roaming among public land mobile networks in different countries. The thinking at the time was that these stakeholders were the only ones in the sector with a justifiable need for MNCs to facilitate authentication, roaming, billing, and routing of their customers.

4.1.2 As noted earlier, in recognition of the evolution of telecommunication networks and the changes in the way telecommunications services are delivered, the ITU amended ITU-T E.212 Recommendation to introduce flexibility regarding the assignment of the E.212 identification resources (MCC+MNC) to entities other than public networks offering mobile services. Annex F of ITU-T E.212 states:

> *"The identification plan was originally devised for use by national cellular radio systems known as public land mobile networks (PLMNs). The identification resources are essential to the operation of cellular radio systems. The identification resources are also essential for fixed and global networks (e.g., global satellite networks, maritime, aeronautical, etc.) to provide innovative services (e.g., nomadic service, messaging service, authentication, presence, etc.), above all in the NGN context.*
>
> *The potential offered by NGN should be given consideration as the current fixed networks. The potential for NGN to be hybrid networks containing both wireline and wireless links and with the ability to provide convergent services should not prevent the assignment of an appropriate ITU-T E.212 identification resource, for the purposes of identification and authentication for access to the convergent services."*[18]

4.1.3 Some countries have made amendments to their respective regulatory instrument(s) to take account of the flexibility allowed under ITU-T E.212 Recommendation to assign

[18] European Conference of Postal and Telecommunications: Electronic Communications Committee (2017). Harmonised European Management and Assignment Principles for Geographic E.212 Mobile Network Codes (MNCs). https://www.itu.int/rec/dologin_pub.asp?lang=f&id=T-REC-E.212-201609-I!!PDF-E&type=items

E.212 identification resources to entities other than public networks offering mobile services. The remainder of this Chapter will look at some of those jurisdictions.

4.2 European Jurisdictions

4.2.1 In its ECC Recommendation 17(02) entitled Harmonised European Management and Assignment Principles for Geographic E.212 Mobile Network Codes (MNCs)[19], the CEPT Electronic Communications Committee noted that some CEPT member countries currently assign geographic MNCs according to strict criteria based on the legacy view on the assignment of geographic MNCs. Examples of some of the CEPT countries which assign MNCs to public networks other than those providing mobile services are provided below.

France

4.2.2 In its Decision Document (No. 2018-0881) published on 2018 July 24, the French regulatory agency ARCEP reorganised the structure of the MCC-MNC plan (also called the IMSI section) and its conditions of use.[20] In the document, ARCEP noted that it undertook work to modernize the framework relating to the allocation and use of numbering resources to take account of the changing needs of operators and end-users and to address problems encountered by these stakeholders. ARCEP noted that the decision to make changes to the MCC-MNC plan was made to *"support the implementation of LTE technology by other types of networks than mobile phone networks open to the public - such as independent networks such as PPDR or PMR or wireless networks open to the public providing very high fixed internet access speed (very high-speed radio networks or radio THD)".*

4.2.3 The decision provided for the allocation of:

- Two (2) dedicated 2-digit MNC codes to meet the needs of the State;
- Three (3) 2-digit MNC codes for testing purposes in a geographically restricted area of a few cells and for a limited time;
- A space of one hundred (100) 3-digit MNC codes in order to meet the needs of operators wishing to provide a fixed broadband Internet access service;
- A space of 200 3-digit MNC codes in order to meet the needs of operators of independent networks assigning frequencies and wishing to use the LTE

[19] Ibid

[20] The Autorité de Régulation des Communications Électroniques, des Postes et de la Distribution de la Presse (2018). Decision No. 2018-0881 of the Electronic Communications and Postal Regulatory Authority dated July 24, 2018 establishing the National Numbering Plan and its Management Rules. https://www.arcep.fr/uploads/tx_gsavis/18-0881.pdf.

technology; codes may also be allocated on an experimental basis under the conditions provided for in IV of article L.44 of the CPCE, on a departmental perimeter.

Ireland[21]

4.2.4 In addition to the typical MNC assignments, Ireland has made assignments to providers of fixed line SMS and fixed cellular service. In the latter case, assignments were made to facilitate service to persons in very remote areas where providing physical fixed-line access is cost prohibitive.

Portugal[22]

4.2.5 In Portugal, fixed network operators may apply for an MNC if they are offering public telecommunication services based on the mobile standards and interoperability of the service to end-users.

Romania[23]

4.2.6 Romania has made assignments of MNCs to fixed network operators for the provision of services in "*fixed networks emulating applications of the mobile networks such as SMS or TEXT messaging*".

Spain[24]

4.2.7 MNCs have been assigned to fixed networks that emulate applications of the mobile networks (SMS services) or where it is necessary for the facilitation authentication and verification of a user request for service.

4.3 Canada

4.3.1 On 2019 February 28, the Canadian Radio-television and Telecommunications Commission (CRTC) issued Telecom Notice of Consultation (2019-57) entitled "*Review of mobile wireless services*"[25] for the purpose of initiating a broad review of mobile

[21] ITU (2014). ITU-T SG 2 (Study Period 2013) Contribution 66: ECC REPORT 212 - Evolution in the Use of E.212 Mobile Network Codes. https://www.itu.int/md/T13-SG02-C-0066/en
[22] Ibid
[23] Ibid
[24] Ibid
[25] The Canadian Radio-television and Telecommunications Commission (2019). Telecom Notice of Consultation CRTC 2019-57. https://crtc.gc.ca/eng/archive/2019/2019-57.htm

wireless services and their associated regulatory framework. In response to the consultation document, the Canadian Electricity Association (CEA) and the Railway Association of Canada (RAC), which represent electrical utilities and railway operators respectively, requested that the Canadian Steering Committee on Numbering (CSCN) be directed to revise the *International Mobile Subscription Identity [IMSI] Assignment Guideline (IMSI Guideline)* to allow critical infrastructure operators (CIOs) to acquire mobile network codes (MNCs). In its decision document, Telecom Regulatory Policy document (CRTC 2021-130) entitled "Review of mobile wireless services"[26] the CRTC made the following statements in relation to RAC's and CE's request:

> *"The Commission considers that granting the CEA and the RAC's request would have clear benefits to the public interest, because it would lead to more reliable, innovative, and integrated networks for CIOs. However, MNCs are a finite resource that must be allocated carefully and used responsibly.*
>
> *As a result, the Commission considers that the CSCN should explore ways to allocate MNCs to CIOs, with a view toward striking the appropriate balance between network complexity and efficiency, while mitigating the potential risk to MNC supply, and make a recommendation to the Commission in this regard.*
>
> *Accordingly, the Commission requests that the CSCN (i) explore the best way to allocate MNCs efficiently to CIOs, (ii) amend the IMSI Guideline to allow CIOs to acquire MNCs, and (iii) submit the amended IMSI Guideline for Commission approval within 120 days of the date of this decision."*[27]

4.3.2 In 2021 December, the CSCN submitted the updated Canadian IMSI Guideline to the CISC for its adoption and forwarding to the CRTC for approval. The Guideline was approved by the CRTC on 2022 July 6 and included the following modifications:

- A change in the term "Wireless Carrier" to "Mobile Carrier" and revising the definition;
- Procedures for the assignment and use of MNCs for Mobile Carriers, Fixed Wireless Carriers, Full Mobile Virtual Network Operators (Full MVNO), experimental licensees, public safety broadband network operations, and Railway or Electricity Operators (REO) in Canada; *and*
- Procedures for recovering MNCs and applying for subsequent MCCs[28].

[26] The Canadian Radio-television and Telecommunications Commission (2019). Telecom Notice of Consultation CRTC 2021-120. https://crtc.gc.ca/eng/archive/2021/2021-130.htm
[27] Ibid
[28] The Canadian Radio-television and Telecommunications Commission (2019). Canadian Steering Committee on Numbering: Reports. https://crtc.gc.ca/cisc/eng/cisf3ff.htm

4.3.3 The Guideline further states under Section 7:

"7.1 An MNC Applicant must demonstrate eligibility by way of an attestation in accordance to one of the following criteria and, if successful, qualifies for an MNC designation corresponding with that category as set out in section 6.0:

a) A Mobile Carrier registered with the CRTC under the wireless carrier list that has a valid and current ISED spectrum license eligible to be used for mobile wireless services as listed in Form A and who provides evidence of such registration and license to the IMSI Administrator;

b) An organization that has received an experimental spectrum license from ISED and who provides evidence of such a license to the IMSI Administrator that specifies that they are authorized to obtain an MNC;

c) A public safety broadband network operator in accordance with Appendix 2 or as otherwise determined by ISED;

d) A Fixed Wireless Carrier that has a valid and current ISED spectrum license eligible to be used for wireless services and who provides evidence of such license to the IMSI Administrator; or

e) An entity registered with the CRTC under the Full MVNO list, and who provides evidence of such registration to the IMSI Administrator.

f) An REO certified in accordance with Appendix 3 who provides evidence of such certification to the IMSI Administrator.

7.3 At least one radio interface protocol used by the applicant must be from the following list of protocols known to require an IMSI for identification and signaling:

a) GSM-based protocols including General Packet Radio Service (GPRS), Enhanced Data for GSM Evolution (EDGE), Wideband CDMA (W-CDMA), and High Speed Packet Access (HSPA);

b) CDMA2000 protocols including CDMA2000 1X (a 3GPP2 cellular technology providing voice and data services) and High Rate Packet Data (HRPD [EVDO]);

c) Long Term Evolution (LTE) protocols including LTE Advanced;

d) 5G New Radio (NR); or

e) such other protocol as ISED identifies as requiring an IMSI for identification and signalling."

Chapter 5: Proposed Changes to the IMSI Assignment Guidelines

5.1 Eligibility Criteria

5.1.1 As noted in the earlier chapters, the ITU's Recommendation E.212 allows for the assignment of MNCs to all public networks. Additionally, some jurisdictions have recently taken steps to modify their frameworks for the administration and management of MNCs to explicitly recognize that these resources can be assigned to networks other than mobile networks.

5.1.2 The eligibility criteria in the Jamaican IMSI Assignment Guidelines only allow for the assignment of MNCs to a public network operator "offering public mobility services with international roaming". Therefore, to qualify for an assignment of an MNC, an applicant will have to be a holder of a mobile carrier and a mobile service provider licence which allows it to own or operate a network capable of providing telecommunication services with mobility as well as provide these services to the public.

5.1.3 The OUR is cognizant that numbering resources are finite in nature and therefore requires careful management of the resources to prevent early exhaustion. However, given that technologies such as FWA and satellite can provide an easier/cheaper solution to offer broadband connectivity to areas where telecommunications infrastructure is not present or is limited, the OUR is minded to extend the eligibility criteria for the assignment of MNCs to include entities other than mobile carriers. It is therefore proposed that MNCs be assigned to:

i. mobile carriers (satellite and terrestrial) offering specified services to the public; or

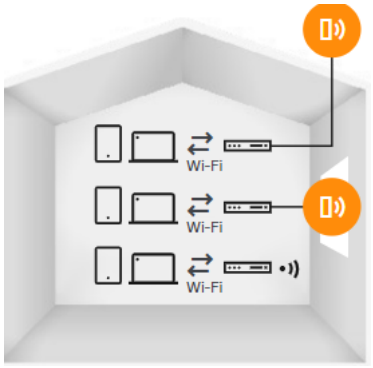
ii. fixed carriers offering specified services to the public and who utilise radio spectrum in the access segment of their networks. This would include satellite operators with ancillary terrestrial communications networks.

FWA Use Cases

5.1.4 The OUR has already noted that there is interest locally in the use of FWA systems to provide voice and broadband services. FWA can also be used to provide cost effective connectivity for IoT applications and power future industries which require continuous, secure, low-latency connectivity such as augmented reality/virtual reality, autonomous vehicles and advanced telemedicine. However, at this time the OUR's focus will be on extending the IMSI Guidelines eligibility criteria to include networks that are using FWA networks to provide business and residential voice and broadband access services.

5.1.5 In such cases, the IMSI resource is typically used for the authentication of end users seeking to access network services. One application of this is where a wide-area wireless-capable device is installed at the customer's premises. The device could be an outdoor unit that is mounted on a roof or wall, or it could be an indoor unit (see Figure 8). Typically, the service provided via such devices is only available within a specific location, i.e., the "subscribed location". The "fixed" subscription arrangement can be achieved either via the fixed mounted device or via a logical arrangement where if the device is relocated, it fails to work, or the subscription is modified[29].

Figure 7: Fixed Indoor or Outdoor Device

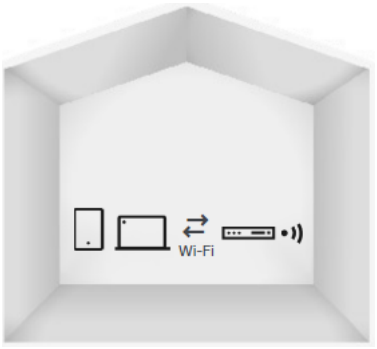


Source: Ericsson

5.1.6 There are instances however, where the fixed wireless service may be nomadic. Nomadic services refer to services and applications for which the end user terminal device may change its places but must be stationary while in use. In such cases, the subscriber will be provided with a wireless indoor router, and the subscriber can relocate the router and continue to receive service if there is a valid subscription (see Figure 9).

[29] Ericsson. *Fixed Wireless Access Handbook - $th Edition.* Retrieved from https://www.ericsson.com/en/fixed-wireless-access/handbook .

Figure 8: Nomadic Indoor Device



Source: Ericsson

Service Boundaries

5.1.7 The carrier licence awarded to a fixed operator expressly excludes the provision of mobile services. The OUR is aware that various technical approaches exist for ensuring that the service provided to a fixed wireless subscriber remain "fixed" i.e., confined to a particular premises. It is therefore expected that fixed wireless carriers will utilise such arrangements and ensure that MNCs assigned to them are not used to facilitate mobility services.

5.1.8 In its response to the Consultation Document, Digicel had indicated its concern that MNCs assigned to fixed carriers who do not have an associated operator could be used to bypass the Jamaican licensing regime for mobile services and for example offer outbound roaming services [30]. The OUR is aware that this risk exists but is of the view that the benefits associated with the use of mobile technologies in the provision of fixed broadband and voice services far outweigh the risk. Where it is found that fixed wireless carriers are utilizing are in breach of their licence, the OUR will initiate the enforcement proceeding outlined in the Act.

Use of Radio Protocols

5.1.9 It is essential that MNCs are only assigned to those Licensees that have a legitimate need for the use of IMSIs within their networks such as for the purposes of end user identification or signalling. In this regard, the OUR is minded to adopt the approach taken by the Canadian authorities who require that at least one of the radio interface protocols used by an MNC applicant must be from the specific list of protocols known

[30] Supra note 5

to require an IMSI for identification and signalling. Section 7.3 of the Canadian IMSI Guidelines states that:

Section 7.3

"At least one radio interface protocol used by the applicant must be from the following list of protocols known to require an IMSI for identification and signaling:

a) GSM-based protocols including General Packet Radio Service (GPRS), Enhanced Data for GSM Evolution (EDGE), Wideband CDMA (W-CDMA), and High Speed Packet Access (HSPA);

b) CDMA2000 protocols including CDMA2000 1X (a 3GPP2 cellular technology providing voice and data services) and High Rate Packet Data (HRPD [EVDO]);

c) Long Term Evolution (LTE) protocols including LTE Advanced;

d) 5G New Radio (NR); or

e) such other protocol as ISED identifies as requiring an IMSI for identification and signalling."

5.1.10 The OUR is therefore proposing that a similar provision be included in the IMSI Guidelines.

5.2 Proposed Amendments

5.2.1 As noted earlier in this document, the OUR is proposing that the IMSI Guidelines eligibility criteria be extended to allow for the assignment of MNCs to entities that require this numbering resource to provide fixed wireless services. The proposed amendments to the IMSI Assignment Guidelines to make them applicable to fixed wireless networks are outlined in Table 2 below. The Table also include proposed amendments and new provisions that are aimed at clarifying some of the procedural arrangements in the guidelines. The proposed amendments to the IMSI Guidelines will also necessitate amendments to some of the ISMI Forms. The revised forms will be published after the OUR completes its review and consultation.

5.2.2 The OUR has also discovered several numbering and formatting errors in the current IMSI guidelines. These errors will be corrected in the revised guidelines that are approved after the OUR completes its review and consultation.

Table 2: Matrix of Proposed Changes to the IMSI Assignment Guidelines

Section	Existing	Proposed
1 PURPOSE AND SCOPE	1.1 The IMSI was created and formatted to provide the unique international identification of mobile terminals and mobile users and to enable these terminals and users to roam among public networks which offer public mobility services.	1.1 This document contains procedures for the assignment and use of IMSIs by Mobile Carriers and Fixed Wireless Carriers in Jamaica. The IMSI was created and formatted to provide the unique identification of a wireless subscription and to enable those subscriptions to access telecommunications services on public networks.
	1.2 These assignment guidelines pertain, in one section or another, to all segments of the IMSI – Mobile Country code (MCC), Mobile Network Code (MNC) and Mobile Station Identification Number (MSIN), in sequential order. The MCC is assigned by the ITU to member countries. The IMSI administrator participates in the management of all segments of the IMSI, but directly administers only the MNC segment. MNCs are assignable to operators of public	1.2 These assignment guidelines pertain, in one section or another, to all segments of the IMSI – Mobile Country code (MCC), Mobile Network Code (MNC) and Mobile Station Identification Number (MSIN), in sequential order. The MCC is assigned by the ITU to member countries. The IMSI administrator participates in the management of all segments of the IMSI, but directly administers only the MNC segment. MNCs are assignable to operators of mobile

Section	Existing	Proposed
	networks offering public mobility services with international roaming capabilities. The MNC uniquely identifies the home network of a mobility service subscriber. The remaining segment of the IMSI, the Mobile Station Identification Number (MSIN), is directly administered by the network operator to which the MNC is assigned.	networks and fixed wireless networks requiring an IMSI for generally accepted functions such as end-user authentication and signalling. The MNC also uniquely identifies the home network of a wireless subscription. The remaining segment of the IMSI, the Mobile Station Identification Number (MSIN), is directly administered by the network operator to which the MNC is assigned.
	1.3 These guidelines were developed for consensus approval of representatives of entities within the telecommunications sector of Jamaica.	1.3 To be deleted.
	1.5 These guidelines are based on the content of International Telecommunication Union – Telecommunications' (ITU-T) Recommendation E.212, The International Identification Plan For Mobile Terminals and Mobile Users. This Recommendation was revised in 1998. The content of this document is in conformance with that iteration of the Recommendation.	1.5 These guidelines are based on the content of International Telecommunication Union – Telecommunications Standardization Sector' (ITU-T) Recommendation E.212: The International Identification Plan for Public Networks and Subscriptions (Recommendation ITU-T E.212 (2016) – Amendment 3). The principles outlined herein for the assignment of

Section	Existing	Proposed
		MNCs are broadly reflective of those outlined in Annex B of the Recommendation.
2.0 REFERENCES		2.0 DEFINITIONS[31]
2.1	2.1 ITU-T Recommendation E.212, The International Identification Plan For Mobile Terminals and Mobile users.	2.1 Recommendation E.212: The International Identification Plan for Public Networks and Subscriptions (Recommendation ITU-T E.212 (2016) – Amendment 3)
3 IMSI FORMATION AND FUNCTION	3.2 Each IMSI uniquely identifies the mobile terminal/user, the home network of the mobile terminal/user, and the home country of the network and of the mobile terminal/user.	3.2 Each IMSI identifies a unique wireless subscription, the home network of that wireless subscription, and the home country of that network. In the case of mobile subscriptions, the IMSI uniquely identifies the mobile terminal/user, the home network of the mobile terminal/user, and the home country of the network and of the mobile terminal/user.

[31] The definitions in the Glossary of the current Guidelines will be relocated to this section in the revised version.

Section	Existing	Proposed
	3.3 The IMSI enables mobile terminals/users to roam among public networks, domestically and internationally, by providing a uniform and unique home network and mobile terminal/user identification that is recognizable by all conforming public networks. When transmitted between visited and home networks, the IMSI enables the exchange of subscription and billing information for the visiting mobile station. Specifically, the IMSI is used for: • Determination of the mobile terminal's/user's home wireless network, • Mobile terminal/user identification when information about a specific mobile terminal/user is to be exchanged between visited and home networks, • Mobile station identification on the radio control path for registering a mobile station in a visited wireless network,	3.3 Wireless Networks use IMSIs to enable: a. determination of a wireless subscription's home network, b. wireless subscription identification when information about a wireless subscription is to be exchanged between visited and home networks, including the subscription and billing information needed to enable charging of visiting wireless subscriptions, c. wireless subscription identification on the radio control path for registering a wireless subscription on a visited wireless network, d. wireless subscription identification for signalling on the radio control path, and e. subscription management, i.e., retrieving, providing, changing, and updating subscription data for a specific wireless subscription.

Section	Existing	Proposed
	• Mobile station identification for signalling on the radio control path, • Identification of the mobile terminal/user to allow for charging and billing of visiting mobile terminals/users, and • Subscription management, i.e., retrieving, providing, changing, and updating subscription data for a specific	
	3.6 The function of the MCC is to identify the domiciliary country of a mobile terminal/user. By analysing the MCC, a visited network can determine the country from which the mobile terminal/user originated and in which its home network resides.	3.6 The function of the MCC is to identify the domiciliary country of a wireless subscription. Some MCCs are used to identify international operators, e.g., satellite systems providing service to aircraft, maritime or land-based wireless subscriptions across or between multiple countries. By analysing the MCC, a foreign visited network can determine the country or international operator from which the wireless

Section	Existing	Proposed
		subscription originated and in which its home network resides.
	3.7 The function of the MNC is to identify the home network, within the country associated with the MCC, of the visiting mobile terminal/user. The visited network uses the MCC-MNC combination to identify and query the home network of the visiting mobile terminal/user that is requesting service. MNCs in Jamaica are three digits in length and in the format XXX, where X equals any of the decimal digits 0-9. The 3-digit maximum is necessary so that, when combined with the 3-digit MCC, the visited network need not analyze more than 6 digits to determine the home network of the visiting mobile terminal/user– another Recommendation E.212 requirement. This format provides a mathematical potential of one thousand MNCs (000-999) for each MCC.	3.7 The function of the MNC is to identify the home network of a wireless subscription within the country associated with the MCC. A visited mobile network uses the MCC-MNC combination to identify and query the home network of the visiting wireless subscription that is requesting service. MNCs in Jamaica are three digits in length and in the format XXX, where X equals any of the decimal digits 0-9. The 3-digit maximum is necessary so that, when the MNC is combined with the 3-digit MCC, a visited network need not analyse more than 6 digits to determine the home network of the visiting wireless subscription – another Recommendation E.212 requirement. This format provides a mathematical potential of one thousand MNCs (000-999) for each MCC.

Section	Existing	Proposed
	3.8 The function of the MSIN is to uniquely identify a mobile terminal/user within its home network. MSINs in Jamaica are nine digits in length and in the format XXXXXXXXX, where X equals any of the decimal digits 0-9. Recommendation E.212 limits IMSI length to a fifteen-digit maximum. Since the Jamaican IMSI format includes a six-digit MCC+MNC, a nine-digit MSIN is the maximum allowable. The nine-digit format provides one billion MSINs per MNC or network, if no other function than mobile terminal/user identification is embedded in the MSIN.	3.8 The function of the MSIN is to identify a wireless subscription within its home network. MSINs in Jamaica are nine digits in length and in the format XXXXXXXXX, where X equals any of the decimal digits 0-9. Recommendation E.212 limits IMSI length to a fifteen-digit maximum. Since the Jamaican IMSI format includes a six-digit MCC+MNC, a nine-digit MSIN is the maximum allowable. The nine-digit format provides one billion MSINs per MNC or network, if no other function than wireless subscription identification is embedded in the MSIN.
4.0 ASSUMPTIONS AND CONSTRAINTS	4.1 These guidelines and procedures should provide the greatest latitude to those providing mobility services with international roaming capability, while permitting the effective and efficient management of a finite resource.	4.1 These guidelines and procedures should provide the greatest latitude to those providing mobile and fixed wireless telecommunication services while permitting the effective and efficient management of a finite resource.
5.0	The assignment principles defined below allow network operators the greatest possible latitude in providing mobility service with international	The assignment principles defined below will apply to the assignment of MNCs by the Office and the use of IMSIs by assignees:

Section	Existing	Proposed
ASSIGNMENT PRINCIPLES	roaming, and the users of these services, the widest possible roaming capabilities.	
	5.1 MNCs are to be assigned and used only by public networks offering mobility services with international roaming capability (Section 1.1).	5.1 MNCs are to be assigned to and used only by mobile carriers and fixed wireless carriers that require an MNC to provide telecommunications services to the public.
	5.2 Upon application, the Office will assign one MNC for each valid network operator. Nothing shall preclude a network operator, however, from aggregating multiple or merged networks/licenses within a single MNC.	5.2 Having determined the validity of an application, the Office will assign an MNC to the Applicant. Separate MCC+MCC resources will be assigned for use in mobile and fixed networks where appropriate. Nothing shall preclude a network operator, however, from aggregating multiple or merged networks/licences within a single MNC.
	5.3 The 6-digit MCC+MNC, as part of the 15-digit IMSI, is to be assigned so as to uniquely identify the home network of the mobility service user worldwide.	5.3 The 6-digit MCC+MNC, as part of the 15-digit IMSI, is to be assigned so as to uniquely identify the home network associated with a wireless subscription worldwide.

Section	Existing	Proposed
	5.4 MSINs are assigned by network operators to their subscribed mobile terminals/users. An IMSI is unique to a single mobile terminal/user, but a mobile terminal/user may have multiple IMSIs.	5.4 MSINs are assigned by MNC Assignees to wireless subscriptions. In principle, only one IMSI should be assigned to each subscription, although multiple subscriptions may be associated with a SIM/USIM/UICC/embedded SIM card.
	5.7 Should an assignee transfer control of a wireless license, then the use of the assigned MNC is transferable to the new licence owner.	5.7 Should an assignee transfer control of a wireless licence to another operator, then the use of the assigned MNC is transferable to that operator with notification to the Office by the filing of Form D – Request for Change in Mobile Network Code (MNC) Assignment Information.
	5.12 These guidelines have no effect on MNC assignments made prior to their approval. Use of all assigned resources shall be consistent with these guidelines.	5.12 These guidelines have no effect on MNC assignments made prior to [EFFECTIVE DATE OF GUIDELINES TO BE INSERTED]. Use of all assigned resources shall be consistent with these guidelines.
	5.14 As required, applicants for MNCs must comply with all applicable local regulations relative to the	5.14 Applicants for MNCs must ensure that they comply with all applicable Jamaican regulatory requirements for the provisioning of services

Section	Existing	Proposed
	provisioning of mobility service with international roaming capability.	applicable to their category (i.e., Mobile Carriers and Fixed Wireless Carriers).
6.0 CRITERIA FOR MNC ASSIGNMENT	6.1 The MNC applicant must be, and certify that it is a public network operator offering public mobility services with international roaming for which an MNC is requested.	6.1 An MNC Applicant must demonstrate eligibility by way of an attestation in accordance with one of the following criteria: a) A Mobile Carrier licensed under the Telecommunications Act; b) A Fixed Wireless Carrier licensed under the Telecommunications Act.
	6.2 The applicant/assignee of an MNC must have and provide evidence of authorization, from the Ministry of Industry, Investment and Commerce to operate in Jamaica to provide mobility services with international roaming capability.	6.2 At least one of the radio protocols to be used by the Applicant must be from the following list of protocols known to require an IMSI for identification and signalling: a) GSM-based protocols including General Packet Radio Service (GPRS), Enhanced Data for GSM Evolution (EDGE), Wideband CDMA (W CDMA), and High Speed Packet Access (HSPA); b) CDMA2000 protocols including CDMA2000 1X (a 3GPP2 cellular

Section	Existing	Proposed
		technology providing voice and data services) and High Rate Packet Data (HRPD [EVDO]); c) Long Term Evolution (LTE) protocols including LTE Advanced. d) 5G New Radio (NR); or e) such other protocol as identified by the OUR and notified to the public.
	6.3 An MNC will only be assigned by the Office upon receipt and approval of a completed *Form A – Home Network Identity (MNC) Application.*	6.3 An MNC will only be assigned by the Office upon receipt and approval of a completed *Form A – Mobile Network Code (MNC) Application.* .
7.0 RESPONSIBILITIES OF MNC APPLICANTS AND ASSIGNEES	7.3.1 Assign and efficiently manage the MSINs (last nine digits of the IMSI) associated with the assigned MNC. Maintain up-to-date and accurate assignment records that match MSINs to mobile	7.3.1 Assign and efficiently manage the MSINs (last nine digits of the IMSI) associated with the assigned MNC and maintain up-to-date and

Section	Existing	Proposed
	terminals/users. These records may be required for audit purposes (Section 10).	accurate MSIN assignment records. These records may be required for audit purposes.
	7.3.2 Inform the Office of changes in the information associated with an MNC assignment by using Form D – Request for Change in Mobile Network Code (MNC) - Assignment Information. Changes may occur because of the transfer of an MNC, through merger or acquisition, to a different network (Section 5.7). The initial assignee of the MNC involved in a transfer occurring through merger, acquisition or other means must immediately inform the Office when such a change becomes effective. Timely submission of change information enables the Office to maintain accurate MNC assignment records.	7.3.2 Inform the Office of changes in the information associated with an MNC assignment, including their contact details (telephone number and email and company address), by using *Form D – Request for Change in Mobile Network Code (MNC) - Assignment Information*. Changes may occur because of the transfer of an MNC, through merger or acquisition, to a different network (Section 5.7). The initial assignee of the MNC involved in a transfer occurring through merger, acquisition or other means must immediately inform the Office when such a change becomes effective. In addition, the company acquiring the IMSI must immediately inform the Office using *Form D – Request for Change in Mobile Network Code (MNC) - Assignment Information*. Timely submission of change information is required to enable the Office to maintain accurate MNC assignment records.

Section	Existing	Proposed
	7.3.6 Return to the Office, using *Form F – Mobile Network Return:* • Any MNC no longer needed for the provision of mobility services with international roaming capability, • Any MNC not deployed within the time period specified, including extensions (Section 5.10), or • Any MNC not used in conformance with these assignment guidelines.	7.3.6 Return to the Office, using *Form F – Mobile Network Code Return:* a. Any MNC no longer required for the provision of the telecommunications services for which it was sought, b. Any MNC not deployed within the time period specified, including extensions, or c. Any MNC not used in conformance with these assignment guidelines.
		New Provision 7.4 All forms referenced herein must be signed and submitted by an MNC Applicant's or MNC Assignee's Authorized Representative for making resource requests. This serves as a control measure for the protection of the MNC Applicant, MNC Assignee and the Office. The MNC Applicant or MNC Assignee may designate its Authorized Representatives for multiple types of numbering resources in a single letter to the Office.

Section	Existing	Proposed
8 RESPONSIBILITIES OF THE OFFICE	8.2 Provide copies of these guidelines and forms to MNC applicants and assignees, and assist them in completing the required forms.	8.2 Provide this Guideline and forms to MNC Applicants and MNC Assignees, and respond to reasonable questions pertaining to any aspect of the IMSI process, forms, instructions, etc. from an MNC Applicant or an MNC Assignee. The IMSI Administrator is not responsible for completing forms for, or training the staff of, MNC Applicants and MNC Assignees.
	8.4.4 When reassigning an MNC that has been returned or reclaimed, the Office will ensure that the MNC has remained dormant for the required period (Section 5.13).	8.4.4 When assigning an MNC that has been returned or reclaimed, the Office will ensure that the MNC has remained dormant for the required period (Section 5.13).
	8.6 Publish, at least monthly, via the agreed medium, a list of assigned MNCs. The list will include the MNC number, the MNC assignee, and the entity contact and number. Track the number of IMSIs assigned and the assignment rate.	8.6 Publish and maintain on the Office's website (www.our.org), a list of assigned MNCs. The list will include the MNC number, the MNC Assignee, and the Assignee's contact information. Track the number of the number of MNCs assigned, recovered and available for assignment.

Section	Existing	Proposed
	8.7 Investigate any MNC that has not been deployed within the required time frame, and issue extensions if appropriate (Section 5.10). Notify the appropriate industry forum if an assignee fails to deploy an assigned MNC within two extensions.	8.7 Investigate any MNC where the MNC Assignee has not submitted a Form C – Mobile Network Code (MNC) Deployment within 12 months of assignment. Where the Office finds that the MNC has not been deployed, it will initiate the reclamation procedure outlined in these assignment guidelines.
	8.10 Inform the Jamaican telecommunications industry, via the agreed method, of any revisions to these guidelines (Section 12).	8.10 Inform the Jamaican telecommunications industry of any revisions to these guidelines via an Industry Notification and publication of the revised guidelines on its website.
	-	**New provision** 8.11 Notify the appropriate industry forum when an MNC is issued, returned, or reclaimed.

Section	Existing	Proposed
10.0 IMSI RESOURCE CONSERVATION AND ASSIGNMENT AUDITS	10.4.3 The Office will expect to review the following information to ensure conformance with these guidelines and the proper use of the IMSI resource: • Verification that not more than one MNC is assigned per network or wireless license • Verification of assignment for each working MSIN, • Date of assignment of each working MSIN, • Activation date of each working MSIN, • Indication of MSIN assignment to end users, and • Status and status date of each MSIN unavailable for assignment; i.e., MSINs assigned for testing, reserved, aging, pending and/or, suspended.	10.4.3 The Office will expect to review the following information to ensure conformance with these guidelines and the proper use of the IMSI resource: a. Verification that not more than one MNC is assigned per network or wireless licence, b. Verification of assignment for each working MSIN, c. Date of assignment of each working MSIN, d. Activation date of each working MSIN, e. Indication of MSIN assignment to end users, and f. Status and status date of each MSIN unavailable for assignment; i.e., MSINs assigned for testing, reserved, aging, pending and/or, suspended.

Section	Existing	Proposed
14.0 GLOSSARY[32]	-	Fixed Wireless Carrier - In the context of the IMSI Assignment Guidelines, Fixed Wireless Carrier means an entity that is licensed pursuant to the Telecommunications Act to operate a fixed network as well as provide fixed telecommunications services to the public and who intends to use a radio protocol that requires an MNC (e.g., satellite operators with ancillary terrestrial communications networks, point-to-point (fixed) radio network operators, and point-to-multipoint (fixed) radio network operators).
	-	Fixed Wireless Network - In the context of the IMSI Assignment Guidelines, Fixed Wireless Network means a network that utilises radio links between two fixed points to provide specified services. The services provided over such networks should not permit a user to move continuously between places during the provision of a single call or data session. For the purpose of these Guidelines, satellite-based networks are included.
	Home network – The network of the service provider to which a given mobile subscriber is subscribed.	Home Network – The network responsible for the subscription identified by the elements within the IMSI.

[32] The definitions in the Glossary of the current Guidelines will be relocated to the Definitions section in the revised version.

Section	Existing	Proposed
	International Mobile Subscriber Identity (IMSI) – The string of decimal digits, up to a maximum of 15 digits, that identifies a unique mobile terminal or mobile subscriber internationally. The IMSI consists of three fields; the Mobile Country Code (MCC), the Mobile Network Code (MNC), and the Mobile Station Identification Number (MSIN).	International Mobile Subscriber Identity (IMSI) – The string of decimal digits, up to a maximum of 15 digits, that identifies a unique wireless subscription internationally. The IMSI consists of three fields: the Mobile Country Code (MCC), the Mobile Network Code (MNC), and the Mobile Station Identification Number (MSIN).
	-	MNC Applicant – An entity who applies for an MNC.
	MNC assignee - The entity to which an MNC has been assigned for the provision of public mobility services with international roaming capability.	MNC Assignee – The entity to which an MNC has been assigned.
	-	Mobile Carrier – In the context of the IMSI Assignment Guidelines, Mobile Carrier means an entity that is licensed pursuant to the Telecommunications Act to operate a mobile network as well as provide mobile telecommunications services to the public (e.g., cellular operators, Personal Communications Services (PCS) operators, Enhanced Specialized Mobile Radio (ESMR) operators, and Mobile Satellite operators using licensed mobile spectrum).

Section	Existing	Proposed
	Mobile Country Code (MCC) – The first field of the IMSI that is 3 digits in length. An MCC either identifies a country or a group of Networks that share an MCC for international services.	Mobile Country Code - The first field of the IMSI that is 3 digits in length., and which identifies the domiciliary country or international operator for a wireless subscription. By analysing the MCC, a visited foreign network can determine the home country where the wireless subscription originated**.**
	-	Mobile Network – as defined in the Telecommunications Act.
	Mobile Network Code - The second field of the IMSI that is 2 or 3 digits in length, The MNC, in combination with the MCC, uniquely identifies the home network of the mobile terminal or mobile user.	Mobile Network Code - The second field of the IMSI that is 2 or 3 digits in length (3 in North America), and which identifies the home network, within the country associated with the MCC, of a visiting wireless subscription. The visited network uses the MCC-MNC combination to identify the home network of the visiting wireless subscription that is requesting service.
	Mobile Subscriber Identification Number (MSIN) – The third field of the IMSI that is a maximum of 10 digits. The MSIN within a given MCC+MNC identifies a unique mobile terminal or mobile subscriber within a public network.	Mobile Subscriber Identification Number (MSIN) – The third field of the IMSI, a 9-digit number (a maximum of 10 digits if the MNC is 2-digits) which is administered by the relevant operator to uniquely identify individual subscriptions.

Section	Existing	Proposed
		Wireless Subscription – A mobile or a fixed wireless subscription.