



DRAFT GUIDELINES FOR DIGITAL TRANSITION: IDENTIFICATION OF AVAILABLE DIGITAL DIVIDEND SPECTRUM

PUBLIC CONSULTATION DOCUMENT

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UTILITIES REGULATION & COMPETITION AUTHORITY

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1. INTRODUCTION

The Communications Act, 2009 (Comms Act), granted the Utilities Regulation and Competition Authority (URCA), the exclusive rights to manage, allocate and assign radio frequency spectrum in The Bahamas.

The purpose of this consultation document is to introduce a framework for digital switchover in the Bahamas by identifying available digital dividend spectrum. Digital dividend spectrum is the spectrum made available by the transition of terrestrial television broadcasting from analog to digital.

1.1 Background

In the past decade, one of the most important spectrum management issues for developed and industrialized countries has been digital switchover (DSO). DSO involves the transition from analogue terrestrial television broadcasting, to digital terrestrial television broadcasting (DTTB), the purpose of which is to free up spectrum for existing and emerging wireless broadband communications services. The issue of DSO is relevant to the Bahamas because the electronic communications market in The Bahamas sources wireless communication equipment from global providers that no longer manufactures analogue devices. For this reason, URCA must identify and provision spectrum for existing and emerging wireless broadband communications services.

To address issues express by its member states concerning DSO, The ITU published the *Guidelines for Transition from Analogue to Digital Broadcasting (the "Guidelines")* in January 2010.¹ According to the Guidelines:

...broadcasting [is] one of the most economic and influential media

¹ Guidelines for transition from analog to digital broadcasting retrieve from <http://www.itu.int/pub/D-HDB-GUIDELINES.01-2010>

to deliver content such as news, education and entertainment and to be able to contribute to narrowing the digital divide, is now on the verge of a revolution which is expected to affect not only broadcasting itself but also other media.

The Guidelines provide, inter alia:

- i. Options for policy and technology choices and Implementation guidelines;
- ii. Context, Relevancy and impact of choices;
- iii. Cost/benefit analysis; and
- iv. Generic roadmaps and main activities

Therefore, URCA will be guided by the above-mentioned ITU recommendations in setting out the relevant framework for DSO and identifying digital dividend spectrum.

In alignment with the above Guidelines, URCA published its *Proposal to Open Standard Spectrum Bands Currently Specified as Closed in the National Spectrum Plan (NSP) 2014 – 2017* on 9 December 2017, wherein URCA proposed the opening of standard spectrum bands designated as closed in the NSP. Subject to finalising its decisions in that process, URCA would in this process only identify available spectrum in line with the Guidelines.

1.2 Objectives

The objectives of this consultation document are as follows:

- i. Identify available spectrum in line with the recommendations set out in the Guidelines;
- ii. Make recommendations based on URCA's knowledge and experience regarding other countries in the region, and feedback from the general public and industry stakeholders while being guided by international best practices;
- iii. Develop protocols to ensure an effective and efficient means of transitioning from analog television broadcasting to DTTB recommended for ITU region 2 countries;

- iv. Identify key issues and the impact the relevant issues will have on stakeholders;
and
- v. Recommend an effective and efficient approach for the implementation of DSO.

URCA issues this public consultation document (ECS 06/2018) to solicit the views of interested parties on URCA's proposed approach.

1.3 Responding To This Consultation Document

Responses to this document should be submitted to URCA by 5:00 p.m. on 29 June 2018. Persons may have their written responses and comments forwarded to the Chief Executive Officer, either:

- by hand to URCA's office at Frederick House, Frederick Street, Nassau; or
- by mail to P. O. Box N-4860, Nassau, Bahamas; or
- by fax to (242) 393-0153; or
- by email to info@urcabahamas.bs.

URCA's preferred format for the written responses is as follows:

- Respondent's name;
- Name of organization (state whether you are a consumer or licensee);
- Email address or other address of respondent; and
- Any other matters that respondents feel URCA should consider under this Consultation process. URCA reserves the right to make all responses available to the public by posting responses on its website at www.urbahamas.bs. If a response is marked confidential, reasons should be given to facilitate URCA evaluating the request for confidentiality. URCA may publish or refrain from publishing any document or submission at its sole discretion.

Unless comments and submissions are of a general nature, they should refer to the related question number or the particular section of the document. URCA will review the responses

received and publish a Statement of Results on the consultation, and issue its Final Decision on or before 30 July 2018.

1.4 Structure of The Remainder of This Document

The remainder of this consultation document consists of the following parts:

- Section 2 describes the legal framework for managing the radio spectrum.
- Section 3 provides the context for digital switchover
- Section 4 identifies DSO imperatives
- Section 5 lists spectrum bands identify for digital dividend
- Section 6 presents cost/benefits analysis
- Section 7 sets out the proposed guidelines
- Section 8 lists the consultation questions
- Section 9 set out the conclusion and next steps

2. LEGAL AND POLICY FRAMEWORK

The Legal and Policy Framework for managing radio spectrum in The Bahamas are set out in the documents listed below:

- i. The Communications Act, 2009 [“Comms Act”];
- ii. The Electronic Communications Sector Policy, 2009 [“ECSP”];
- iii. The National Spectrum Plan 2018-2021 (“NSP”); and

2.1 Communications Act, 2009

Part V of the Comms Act addresses the issue of spectrum management while Section 29 gives URCA exclusive rights to manage, allocate and assign all frequencies within the radio spectrum bands for The Bahamas.

However, the Comms Act provides that the Minister be responsible for deciding the method of allocating frequencies in the Premium Spectrum Bands. The remaining sections of Part V serve to ensure that URCA manages the radio spectrum in a manner that is open, objective, transparent and non-discriminatory, economically efficient and facilitates the evolution of new technologies and services. Also, Section 34(2) sets the requirement that URCA *“shall conduct public inquiries and consult with electronic communications service providers and network operators in The Bahamas about the use and management of radio spectrum”* which is of particular relevance to this consultation process.

2.2 National Spectrum Plan

URCA is required by section 31(1) of the Comms Act, *“to publish a spectrum plan, which is consistent with applicable international treaties, commitments or standards including without limitation those of the International Telecommunications Union (ITU) and shall take into account relevant international recommendations.”* In accordance with that requirement, URCA published the National Spectrum Plan 2014-2017 (ECS 03/2014) (NSP) on 10 April 2014. As part of that NSP, URCA has also included as a requirement under Section 31(3) of the Comms Act,

spectrum classifications as being either “Premium” or “Standard” spectrum. In managing the radio spectrum, Section 32(1)(b) states that URCA must ensure that the radio spectrum is managed and used in a manner that is economically efficient and facilitates the evolution of new technologies and electronics communications services whilst taking into account in particular investment in existing equipment configured for specific radio spectrum and the cost of migrating to another radio spectrum.

In the development of the NSP, URCA was seeking to:

- i. implement administrative cost recovery for spectrum management and administration;
- ii. conduct a systematic review of current spectrum license fees; and
- iii. establish information systems to cope with future spectrum management needs, improve business processes and enhance access to wireless electronic communications services.

URCA’s public consultation on the Review of Spectrum Pricing published on 28 January 2016 effectively addressed the first two issues. URCA is now seeking to establish information systems to cope with future spectrum management needs and enhance access to wireless electronic communications services by making spectrum resources available for wireless electronic communications services. Hence, this consultation document on *“identification of available spectrum for digital dividend.”*

2.3 Electronic Communications Sector Policy (ECSP)

Section 5 of the Comms Act requires that all policy measures, decisions, and laws take effect in the Electronic Communications Sector (ECS) in The Bahamas and implements the Electronic Communications Sector Policy (ECSP) objectives as set out in Section 4 of the Comms Act, and the ECSP made by the Government from time to time in accordance with section 6 of the Comms Act. Through this consultation process, URCA will seek to implement the ECSP objectives. Since this proposal relates to the identification of available spectrum for digital

dividend, URCA is specifically aiming to promote the optimal use of state assets, in particular, the radio spectrum. Also, URCA is aiming to promote investment and innovation in electronic communications networks and services in addition to encouraging, promoting and enforcing sustainable competition.

2.4 Opening of the Standard Spectrum Bands

As previously stated, URCA published its *Proposal to Open Standard Spectrum Bands Currently Specified as Closed in the National Spectrum Plan (NSP) 2014 - 2017* on [XX 2018]. In that document, URCA proposed the opening of all **standard spectrum** bands designated as closed in the NSP (2014 – 2018) inclusive of the closed portions of the spectrum between 54 MHz – 806 MHz referred to by the ITU as the digital dividend bands.

3. CONTEXT FOR THE DIGITAL SWITCHOVER

As the digital era continues to evolve, digital systems are rapidly replacing analogue systems. The reason being when compared to analog systems, digital systems are more scalable, reliable, and integrable. Also, with all things being equal, digital systems have lower power consumptions and higher transmission capacity². Hence, many communications industries are phasing out analogue technologies and adopting digital technologies³. This transformation process is known as a Digital Switchover (DSO).

3.1 What Is Digital Switchover?

Digital Switchover (DSO) is the term used for the phasing out of traditional analogue systems and analogue centric regulatory policies and equipment for the transmission and reception of television signals, and having them replaced with its digital counterpart for the transmission and reception of television signals.

DSO involves the transition from analogue to digital terrestrial television broadcasting (DTTB). DTTB is the transmission of television signals using digital rather than the transmission of analogue signals. Digital Television Transition (DTT) is the process in which analog television broadcasting is converted to and replaced by digital television.⁴

3.2 Why Is Digital Switchover Important?

One of the main reasons for digital switchover is to repurpose spectrum for new digital communication systems by discontinuing the use of spectrally inefficient analogue TV systems. The process involves the implementation of regulatory policies that mandate the cessation of

² Anttalanainen, T. (2003). *Introduction to Telecommunications Network Engineering*. United States of America: Artech House, Inc.

³ U.S. Congress, Office of Technologies Assessment. *Telecommunications Technology and Native Americans: Opportunities and Challenges*. OTA-ITC-621)Washington, DC: U.S. Government Printing Office, August 1995).

⁴ <https://www.fcc.gov/general/digital-television>

analogue transmissions and the adoption of digital broadcasting technologies. The transition to digital involves several key stakeholders. Figure 1 below shows the Key Stakeholders,⁵

Figure 1

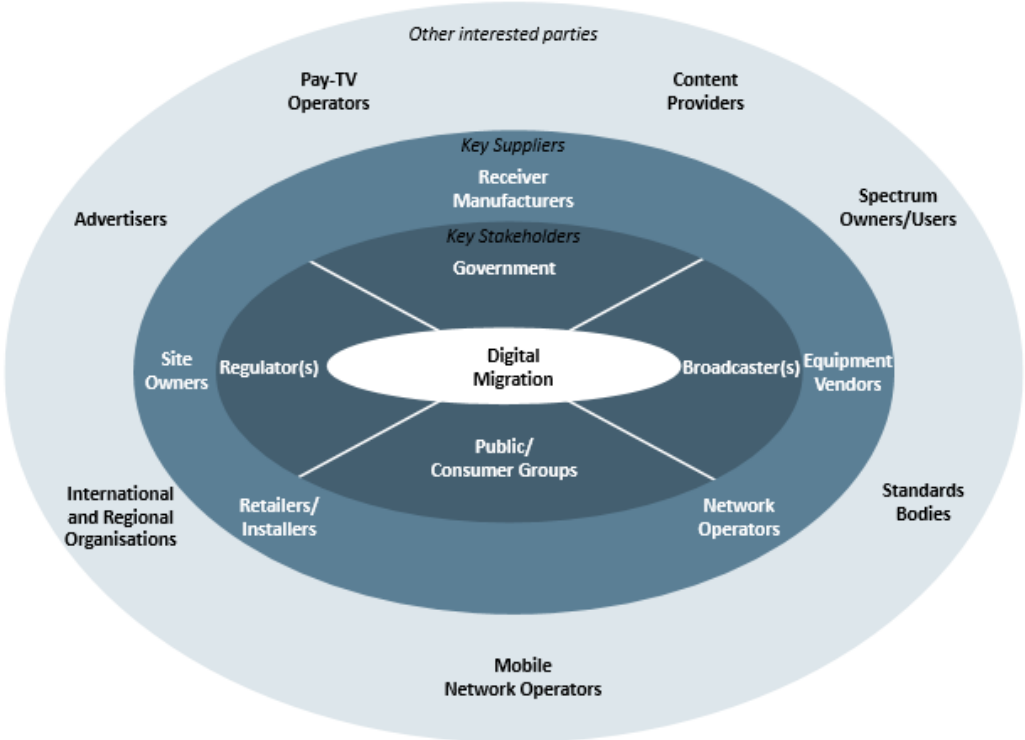


Table 1 below shows the roles lists who the Key Stakeholders are in the digital switchover, and what may be their role, concerns and interest of these stakeholders.

Table 1: Stakeholders Roles, Concerns Interests and Obligations

STAKEHOLDERS	ROLE, CONCERNS, INTERESTS AND OBLIGATIONS
Broadcasters	Concern: The monetary impact of having to migrate to a digital platform; the need to transform to take advantage of all the new technologies and service offering digital broadcast would bring.

⁵ [Source: Plum Consulting document 2014. www.plumconsulting.co.uk.]

National Operators	Network	Concern: Compatibility issues as it relates to interconnection for remote broadcasting and other broadcasting services through the network.
National Regulators		Role: Monitor and manage the digital switchover process; Enforce government regulation and manage the spectrum.
The General Public		Concern: An education plan and campaign leading up to implementation; Ease of accessibility; costs; technical support or otherwise; public education and information flow during switchover (public awareness).
Business Enterprises		Concern: Capital budgets for the purchase of new digital receivers and accessories; Sector competition and regulatory restrictions.
Government		Obligation: Set Policy agendas; look at environmental concerns as it relates to the local and international dumping of analogue equipment; Oversee and regulate the process of digital switchover and also look at international obligations (ITU).

Question 1: Are there any other roles, concerns, interest or obligations relating to stakeholders URCA should consider in implementing the DSO framework.

According to a Digital Television Action Group (DIGITAG) report, manufacturers in North America, Asia, Europe and some parts of Africa, have already discontinued the manufacturing of analogue television broadcasting transmitters. Also, television manufacturers such as LG, Panasonic, Samsung, Vizio, Sony, Toshiba and Sharp have fully embraced the digital revolution and have committed to producing only digital television sets. Congruently many countries have formulated strategies to complete the DSO process by the year 2018. As a result, countries without plans to implement digital switchover may soon find it difficult to obtain replacement components or technical support for existing analogue television and broadcasting

equipment, as manufacturers are no longer supporting analogue technologies. Analogue television is quickly becoming obsolete.

3.3 International Perspective

The ITU held a Regional Radiocommunications Conference (RRC-06)⁶ from 15 May 2006 to 16 June 2006 in Geneva Switzerland where it was decided that all Region-I countries in Europe, Africa and the Middle East would migrate to the Digital Video Broadcasting-Terrestrial (DVB – T) standard by June 2018.

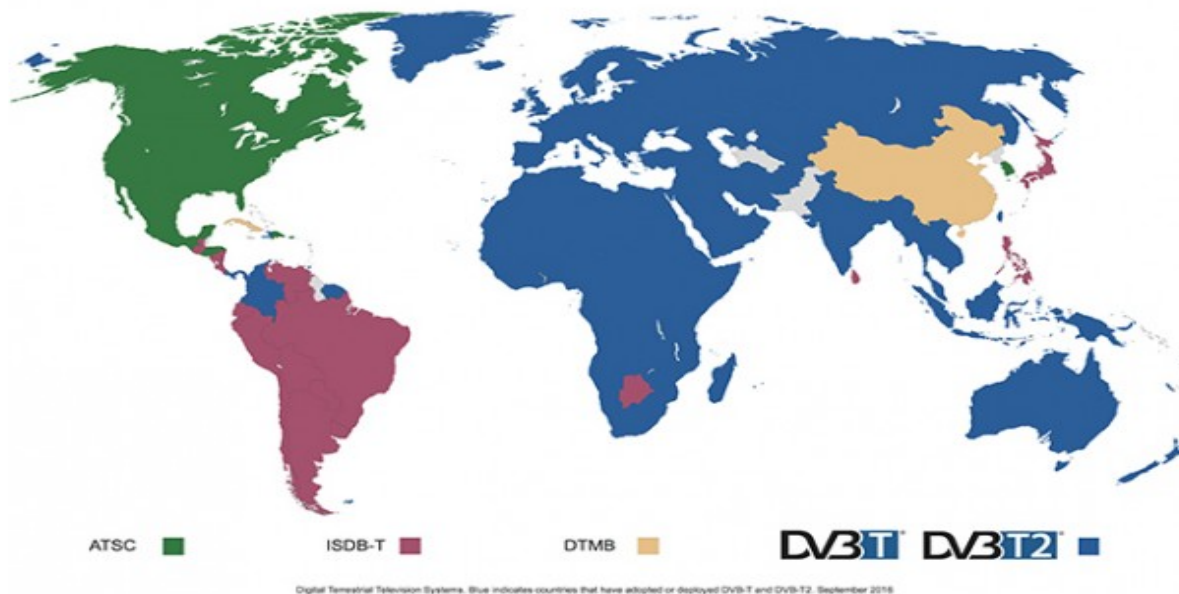
Countries from Regions II including North America, Latin America, and the Caribbean along with Region 3 countries have either converted or are converting their analogue terrestrial television services to digital television services. The underlying purpose of the conversion is to facilitate the introduction of cutting edge and cost-efficient electronic communication services and facilities.

Region II countries like the United States, Canada, South America and the rest of the Caribbean, have not reached consensus regarding the implementation of DSO, or the adoption of a harmonised digital television standard for the region.⁷ Hence, several standards have been implemented across the region. The map below shows the Digital Terrestrial Television Standards adopted by the different countries.

⁶ The Regional Radio Conference 2006 (RRC-06) is the conclusion of a major spectrum re-planning exercise for frequency plan for digital broadcasting in bands III (174-230 MHz) and IV/V (470-862 MHz) for 120 countries in Europe, Africa and the Middle East as shown in Appendix V. The RRC-06 culminated in the drawing up of a new spectrum plan for these bands, which is now referred to as GE-06, which stands for Geneva 2006. This plan, which is meant to facilitate the move from analogue to digital broadcasting of TV and radio, replaces the previous Stockholm Plan, which was drawn up in 1961 - these plans are meant to last over the very long-term. (Source - <https://tatt.org.tt/Portals/0/documents/Digital%20Terrestrial%20Television%20Broadcasting%20Framework%20Draft%20Sept%202011.pdf>).

⁷ <http://www.itu.int/ITU-D/arb/ARO/2014/DB/Docs/S1-LucHaeberle.pdf>

Figure 2



In Figure 2:

- green represents the percentage of countries using the North American Standard which is Advance Television Systems Committee (ATSC);
- purple represents the percentage of countries using the Japanese Standards which is Integrated Services Digital Broadcasting (ISDB-T);
- yellow represents the percentage of countries using the Chinese standards which is digital terrestrial multimedia broadcast (DTMB); and
- blue represents the percentage of countries using European standards which is digital video broadcasting terrestrial (DVB-T).⁸

URCA notes that traditionally, service providers and the public in The Bahamas purchase professional broadcasting equipment and other electronic consumer goods, including televisions, in the North America markets. Therefore, URCA is minded to adopt The North American Standard for DTT and the North American spectrum band plans cited for DTT.

⁸ See Appendix

Question 2: Do you believe that The Bahamas should adopt the North American standards for DTT? If not please provide reasoning for your answer(s).

Question 3: Do you believe that The Bahamas should follow the North American television broadcast spectrum band plans for DTT? If not, please provide reasoning.

3.4 The Bahamas Perspective

Presently there is only one “Free – To – Air” (FTA)⁹ television broadcasting station in The Bahamas, which is ZNS TV-13 operated by the Broadcasting Corporation of The Bahamas (BCB). BCB voluntarily transitioned to digital format in September 2016. Hence, the issue of coordinating the switch-off of old analogue television systems (OAS) and turning on of the new digital systems (NDS), which is address in the Guidelines, is not relevant in The Bahamas. Instead, URCA will focus on the provisioning of digital transition spectrum.

⁹ Television (TV) services broadcast in clear (unencrypted) form, allowing any person with the appropriate receiving equipment to receive the signal and view the content without requiring a subscription, <https://www.quora.com/Whats-the-difference-between-free-to-air-television-channels-and-cable-or-digital-satellite-TV-systems>

4. IMPERATIVES FOR THE MIGRATION TO DIGITAL TELEVISION BROADCASTING

The two main DSO imperatives are facilitating switchover from analog to digital and identification of available spectrum. A brief explanation of the issues surrounding these imperatives are set out below:

Imperative 1 - Facilitating switchover from analogue to digital

Having regard for this imperative, URCA has assessed the current state of the spectrum identified for DSO and has determined that there are no existing analogue systems to be transitioned to digital. Therefore, in the context of The Bahamas, there is no need for analogue to digital switchover.

Imperative 2 - Identification of Available Spectrum

Regarding Imperative 2, URCA must identify the digital dividend spectrum. The spectrum available for digital dividend is set out in Table 3 in Section 5. That spectrum has been allocated for broadcast, mobile and fixed electronic communication services. As it relates to the spectrum identified in Table 3, URCA will design or adopt band plans that are suitable for DTTB, MTV and emerging technologies in accordance with the provisions in the National Spectrum Plan 2018 – 2021.

In addressing the DSO imperatives, URCA will be mindful of the impact that broadcasting has on various aspects of the society.

5. IDENTIFICATION OF SPECTRUM BANDS

In keeping with best practices, URCA in its National Spectrum Plan formulated and issued the National Frequency Allocation Table (NFAT) which sets out the allocations which are applicable in The Bahamas. The allocations in the NSP conform to the recommendations contained in the International Table of Frequency Allocations published in the most recent version of Article S5 of the International Telecommunication Union Radio Regulations (ITU-RR 2016).

5.1 Allocation Of Spectrum

Table 3 below lists the DTTB frequency ranges that is currently allocated for use in The Bahamas for “Free-To-Air” television services:

Table 3: List of DTTB Frequency Ranges

FREQUENCY (MHz)	SERVICE ALLOCATION
54 – 68	BROADCASTING Mobile Fixed
68 – 72	BROADCASTING Mobile Fixed
76 – 88	BROADCASTING Mobile Fixed
174 – 216	BROADCASTING Fixed Mobile
470 – 512	BROADCASTING Fixed Mobile 5.292 5.293
512 – 608	BROADCASTING 5.297
614 – 698	BROADCASTING Fixed Mobile 5.293 5.309 5.311A
806 – 890	FIXED MOBILE BROADCASTING 5.317A

Although the NFAT shows an allocation for broadcasting in the range 698 – 806 MHz, URCA previously allocated spectrum in the range 698 – 806 MHz to cellular mobile, fixed broadband,

and public safety.¹⁰ Hence, URCA will not make assignments in that range for broadcasting.

5.2 Spectrum Band Planning

In Section 5 of the NSP, URCA sets out the policy considerations for Spectrum Band Planning. The policies proposed herein are aligned with the provisions of the NSP. Specifically, URCA will adopt or design spectrum band plans that conform to international standards and emerging technologies with a view to:

- i. Ensuring harmonized spectrum access conditions which enable interoperability and economies of scale for wireless equipment;
- ii. Working towards more efficient use of the radio spectrum; and
- iii. Improving the availability, accessibility, and affordability of information and communications technologies throughout The Bahamas.

In proposing the method for assigning spectrum (i.e., first-come-first served or competitive selection), URCA will consider the following broad characteristics of the spectrum band:

- i. Demand - Sufficient potential licensees have requested, or are likely to request, access to the spectrum, resulting in URCA being unable to fulfil its objective of allocating spectrum to meet the needs of all users.
- ii. Technology - A specific technology deployed in the spectrum band which would offer new services to consumers in The Bahamas. Technological advances have resulted in the spectrum becoming newly suitable for additional services.
- iii. Competitive Pressures- Use of the spectrum, perhaps in conjunction with technical advances, creates a significant commercial advantage. The spectrum could be used to quickly introduce competition to an existing service offering provided by another licensee.

¹⁰ *Opening Of Spectrum Bands: 700MHz, 11 MHz, 12 MHz and 42 MHz (ECS 09 /2012). Published on.23 March 2012. <http://www.urbahamas.bs/wp-content/uploads/2017/01/Policy-New-Spectrum-Bands-.pdf>.*

- iv. Award and Pricing Mechanism- Grants of the spectrum would be made more efficiently through some competitive process, rather than on a first-come, first-served basis with an administrative usage fee schedule.

The list of criteria should not be considered exhaustive and if it deems it appropriate, URCA may elect to use a number of additional characteristics as part of its specification process.¹¹

¹¹ National Spectrum Plan (2014-2017)(ECS 03/2014) published by URCA on 10 April 2014.

6. REVIEW OF COSTS AND BENEFITS OF DSO

URCA considers that the cost associated with DSO is primarily associated with decommissioning of analogue TV systems and purchasing and commissioning of new DTTB systems. In the context of The Bahamas, the cost is minimal because there are no analogue TV stations that would be required to transition to digital format.

On the other hand, URCA considers that there would be significant benefits for service providers and other stakeholders resulting from identifying and provisioning of digital dividend spectrum for existing and emerging electronic communications systems and services. These benefits would be consequential to URCA advancing the following ECSP objectives:

- i. promoting the optimal use of state assets, in particular, the radio spectrum by improving spectrum efficiency. The resulting benefit will be the availability of additional spectrum for expansion of wireless services.
- ii. promoting investment and innovation in digital electronic communications networks and services. The resulting benefits would be:
 - a. superior sound and picture quality;
 - b. multiple programme channels in a single RF channel;
 - c. provisioning for video on demand services;
 - d. opportunities for public-private partnerships to introduce distance learning, telemedicine and other social services into the education system, public Hospitals and clinics in underserved areas in the country.
- iii. encouraging, promoting and enforcing sustainable competition. The benefits will be:
 - a. a wider range of new services such as electronic programme guide, interactive services (texting), and closed caption, etc;
 - b. higher demand in the consumer electronics market stimulated by the availability of new services; and

c. further removal of barriers to market entry.

Having given due consideration to the costs in accordance with section 5 requirements of the Comms Act, URCA is satisfied that the benefits of digital transition significantly exceed the costs.

Question 4: Do you agree with URCA's findings in respect of the costs and benefits of DSO? If not, give reasons why?

7. PROPOSED GUIDELINES

In this section, URCA sets out its proposed guidelines for the identification and provisioning of digital dividend spectrum for existing and emerging electronic communications systems and services.

Part 1 Introduction

1.1 In exercise of the powers and duties conferred upon it by Section [section x] of the Communications Act, 2009, (the “Comms Act”) the Utilities Regulation And Competition Authority (“URCA”) Hereby issues the following guidelines. These guidelines may be cited as the “Guidelines for The Identification And Provisioning of Digital Dividend Spectrum for Existing And Emerging Electronic Communications Systems and Services (the “Guidelines”).”

Part 2 Purpose

- 2.1 The purpose of these Guidelines is to identify the spectrum that has been designated as Digital Dividend spectrum and specify the methodology URCA will use to make frequency assignments in the Digital Dividend spectrum bands.

- 2.2 In addition, these Guidelines specify the technical rules and standards that will apply to Digital Terrestrial Television Broadcasting and Mobile Television Networks.

Part 3 Interpretations

- 3.1 In these Guidelines, unless the context requires otherwise, the following shall have the meanings ascribed below:
 - i. Advanced Television Systems Committee (ATSC) means the digital terrestrial television standard adopted by URCA for use in The Bahamas by television broadcasters.

- ii. Digital dividend spectrum is the spectrum made available by the transition of terrestrial television broadcasting from analog to digital.
- iii. Digital Switchover means the phasing out of traditional analogue systems and analogue centric regulatory policies equipment for the transmission and reception of television signals, and having them replaced with its digital counterpart for the transmission and reception of television signals.
- iv. Digital Terrestrial Television Broadcasting (DTTB) means the transmission of television signals using digital rather than the transmission of analogue signals.
- v. Digital Television Transition (DTT) means the process in which analog television broadcasting is converted to and replaced by digital television.
- vi. Mobile Television (MTV) means DTTB delivered by means of a mobile television network.
- vii. Mobile Television Standards means the standards set out in the GE06 agreement (article 1.3) including DVB-T and T-DAB standards and any other MTV standards that may be agreed by international convention.

3.2 Terms not defined in this Part shall have the meaning ascribed to them in the Comms Act or other relevant regulatory instruments.

Part 4 Application

4.1 These Guidelines shall apply to broadcasting, mobile and fixed service providers operating networks in the Digital Dividend spectrum bands listed in Table 1 below:

TABLE 1: DIGITAL DIVIDEND SPECTRUM BANDS

FREQUENCY (MHz)	SERVICE ALLOCATION
54 – 68	BROADCASTING Fixed Mobile
68 – 72	BROADCASTING Fixed Mobile
76 – 88	BROADCASTING Fixed

FREQUENCY (MHz)	SERVICE ALLOCATION
	Mobile
174 – 216	BROADCASTING Fixed Mobile
470 – 512	BROADCASTING Fixed Mobile
512 – 608	BROADCASTING
614 – 698	BROADCASTING Fixed Mobile
806 – 890	FIXED MOBILE BROADCASTING

Note that although the NFAT shows an allocation for broadcasting in the range 698 – 806 MHz, URCA previously allocated spectrum in the range 698 – 806 MHz to cellular mobile, fixed broadband, and public safety. Hence, URCA will not make assignments in that range for broadcasting.

Part 5 Permissible Services

- 5.1 The following services are permissible in the bands set out in Part 4 of these Guidelines:
- i. broadcast services including DTTB and MTV;
 - ii. fixed wireless broadband services;
 - iii. cellular mobile services; and
 - iv. other services URCA may assign.

Question 5: Do you agree with the lists of services identified as permissible in the bands set out in Part 4 of these Guidelines? If not please provide reasoning.

Part 6 Permissible Standards

- 6.1 The following standards are permissible in the bands set out in Part 4 of these Guidelines.
- i. ATSC is permissible for DTTB services; and

- ii. any standard that URCA may determine to be acceptable and in accordance with international recommendations is permissible for:
 - a) MTV services,
 - b) fixed wireless broadband services; and
 - c) cellular mobile services.

8. LIST OF CONSULTATION QUESTIONS

Question 1: Are there any other roles, concerns, interest or obligations relating to stakeholders URCA should consider in implementing the DSO framework.

Question 2: Do you believe that The Bahamas should adopt the North American standards for DTT? If not, please provide reasoning for your answer(s).

Question 3: Do you believe that The Bahamas should follow the North American television broadcast spectrum band plans for DTT? If not, please provide reasoning.

Question 4: Do you agree with URCA's findings in respect of the costs and benefits of DSO? If not, give reasons why?

Question 5: Do you agree with URCA's view of the services identified as permissible in the bands set out in Part 4 of these Guidelines? If not please provide reasoning.

9. NEXT STEPS

URCA invites responses to this Consultation Document from all interested parties and the general public alike. Subsequent to receiving responses on or before 5 p.m. on **29 June 2018**, URCA will:

- i. Issue a Statement of Results responding to all comments and representations received to this Consultation Document; and
- ii. Issue the Guidelines within thirty (30) days of the closing date for receipt of comments.

ANNEX 1: STANDARDIZED GLOSSARY OF ABBREVIATIONS

API	Application Program Interface
ASO	Analogue Switch-Off
ATSC	Advance Television Standards Committee
ATU	African Telecommunications Union
DD	Digital Dividend
DRAM	Dynamic Random Access Memory
DSO	Digital Switch-Over
DTH	Direct-to-Home
DTT	Digital Terrestrial Television
DVB	Digital Video Broadcasting
DVI	Digital Visual Interface
EPG	Electronic Program Guide
FTA	Free-To-Air
HD	High Definition
HDMI	High-Definition Multimedia Interface
HDTV	High Definition Television
IDTV	Integrated Digital TV
IPTV	Internet Protocol TV
ITU	International Telecommunication Union
MFN	Multi Frequency Network
MPEG	Moving Picture Experts Group
MUX	Multiplex OPEX Operational Expenditure
PPP	Public Private Partnership
PSB	Public Service Broadcaster
PVR	Personal Video Recorder
RF	Radio Frequency

RFI	Request for Information
RFP	Request for Proposal
SD	Standard Definition
SFN	Single Frequency Network
SI	Service Information
SMS	Short Message Service
STB	Set-Top-Box