



**Policy for Allocation and Assignment of Spectrum  
2.5GHz Band (2500MHz - 2690MHz)**

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# **Policy for Allocation and Assignment of Spectrum 2.5GHz Band (2500MHz - 2690MHz)**

## **Table of Contents**

### **Part 1: The Objective**

### **Part 2: The Consultation**

**The Band-Plan Model Allocation**

**Technology Usage Allocation**

**Spectrum Demand**

**"Optimum" Quantity of Spectrum**

**Spectrum for Public Safety**

**Spectrum Assignment**

**Pricing**

**Spectrum Reserve**

### **Part 3: The Policy**

**Channel Plan Allocation**

**Spectrum Assignment Methodology**

**Spectrum Assignment Cap**

**Spectrum Licence Fees**

**Spectrum Licence Conditions**

**Implementation Date**

### **Annexes**

**Annex 1:** Public Consultation Document published on 7 May 2015.

**Annex 2:** Digicel response to public consultation dated 29 May 2015

**Annex 3:** LIME response to public consultation dated 5 June 2015

## **Policy for Allocation and Assignment of Spectrum 2.5GHz Band (2500MHz-2690MHz)**

### **Part 1: The Objective**

Following an application from Andrew's Communications Ltd. for assignment of spectrum in the 2.5GHz band, an unopened band, the Commission decided to establish a policy for the allocation and assignment of spectrum in the 2.5GHz band that would promote the timely deployment of fixed and mobile wireless broadband services using Frequency Division Duplex/Time Division Duplex (FDD/TDD) technology for the benefit of all consumers of fixed and mobile wireless broadband services in the TCI.

With this objective the Commission conducted a public consultation to formulate a policy for the allocation of the 2.5GHz band and the assignment of spectrum in that band. The public consultation document [Annex 1] examined modalities of allocation and assignment of frequencies in the 2.5GHz band consistent with internationally accepted approaches for such allocation and assignments and raised specific questions relating among other things to channelization, caps optimization, reserves and future uses, assignment approaches and fees,

Responses to the consultation were received from Digicel TCI Limited [Annex 2] and from LIME [Annex 3].

## Part 2: The Consultation

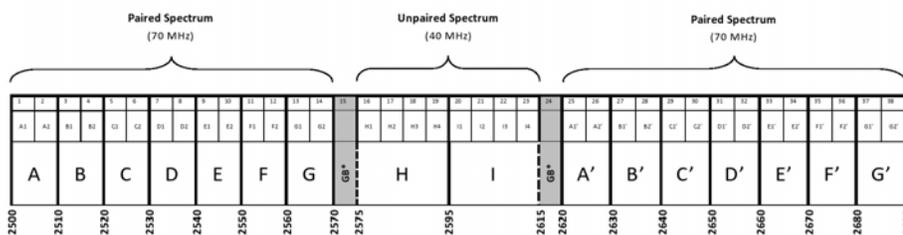
In the consultation the Commission invited comments on the application of Andrew's Communications for assignment of spectrum in the 2.5GHz band, but it also raised specific questions regarding the following issues:

### The Band-Plan Model Allocation

The Commission proposed two band-plan models using FDD and TDD technologies, but it expressed a preference for a model using TDD technology that divides the band into 38 channels of 5MHz and allows for combining channels in block-widths of 5, 10, 15 and 20MHz. This preference was thought to provide operators with more flexibility on the efficient use of the band.

Digicel supported the Commission's preference for a band plan using TDD technology, but suggested that for mobile-based LTE technology usage, channel block-widths of 20MHz are more appropriate. LIME noted that to be more functional the band-plan should also specify which channel blocks are to be paired and unpaired.

Following on these observations, with the view of providing operators in the TCI with the most flexibility on the efficient usage of the band, the Commission decided to allocate the 2.5GHz band for mixed FDD/TDD technology usage with paired and unpaired channel blocks in accordance with the following band-plan model:



\*GB - Guard Band

### **Technology Usage Allocation**

To promote technology neutrality, the Commission proposed that the providers of wireless broadband services in the 2.5GHz band use technology of their choice.

Digicel suggested that because the provision of LTE services is likely to be the preferred usage in the band, the technology requirements should be weighted in favour of LTE services and other technologies consistent with LTE services requirements.

Following on these observations the Commission decided to assign spectrum in the 2.5GHz band primarily for the deployment of LTE-based services.

### **Spectrum Demand**

The Commission requested the existing commercial mobile licensees and entities interested in acquiring commercial mobile spectrum to provide information on their anticipated spectrum needs in the 2.5GHz band.

Digicel responded that their network and service evolution plans indicate a 1x 60MHz requirement for LTE TDD spectrum in the 2.5GHz band for deployment of mobile and fixed wireless broadband services on mobile devices that become capable of supporting those frequencies. Digicel envisages commencing deployment of mobile LTE services in the 2.5GHz band in 2016.

Because Andrews' application requested 100MHz of spectrum in the 2.5GHz band, and because the Digicel plans indicate a requirement of 60MHz, the demand appears to be great. Following on these observations, the Commission decided that assignments should therefore be capped at a maximum bandwidth per applicant.

### **Optimum Quantity of Spectrum**

The Commission requested comments on the optimum quantity of spectrum that should be assigned to applicants for delivery of allocated services in the 2.5GHz band.

Digicel suggested that the optimum quantity should be an amount that favours operators proposing to credibly deploy mobile services in the band. LIME expressed its concerns with the amount of spectrum requested by Andrews (100 MHz) and Digicel (60MHz) stating that the amounts appear unnecessary and unlikely to be optimal.

Following the cap set for assignment in the 2.5GHz band by Industry Canada, the Commission decided to set a cap of 40MHz per applicant on the assignment of spectrum in the 2.5GHz band, but that this cap could be reviewed on a case-by-case basis.

### **Spectrum for Public Safety**

The Commission proposed that a portion of the 2.5GHz band be allocated for public health and safety services. Though public safety agencies were included in the consultation none responded to the consultation.

Digicel stated that it could not identify any requirement for public safety services in the 2.5GHz band. Digicel thought that given the relative propagation characteristics of the

2.5GHz band compared to the 700MHz band, the 700MHz band appeared to be a more appropriate spectrum channel reserve for public safety purposes.

The Commission noted that spectrum is reserved in the 700MHz band for public safety purposes and decided that unused spectrum channel blocks in the 2.5GHz band would be allocated for future uses, including public safety, if a demand arose.

### **Spectrum Assignment**

The Commission noted that in the past spectrum assignments were traditionally on a “first-come, first-served” basis, though a comparative selection method was used to assign the 700MHz spectrum. The consultation asked which method would be preferable for assignment of the 2.5GHz spectrum.

Digicel responded that a simple “first-come, first-served” approach would not be compatible with a proposal to award an optimum amount of spectrum in the band.

Having regard to the availability of spectrum in the 2.5GHz band and the decision to cap assignments at 40MHz per applicant, the Commission decided to continue to assign spectrum in the 2.5GHz band on a “first-come, first-served” basis.

### **Pricing**

The Commission proposed that the price of spectrum frequencies in the 2.5GHz band be set at the price of the non-prime spectrum frequencies in the 700MHz band (4.3¢ MHz/pop).

Digicel suggested that the price of frequencies in the 2.5GHz band should be set at a discount from price of frequencies in the 700MHz band. LIME agreed with Digicel and suggested that the price be set at (3.9¢ MHz/pop), the price set for frequencies in the 850MHz and 900MHz bands.

The Commission had based its price proposal on the non-prime 700MHz band frequencies because of the use of LTE technology in that band, but the Commission decided to accept the price of (3.9¢ MHz/pop) set for frequencies in the 850MHz and 900MHz bands as the price of spectrum frequencies in the 2.5GHz band.

### **Spectrum Reserve**

The Commission proposed to reserve some spectrum in the 2.5GHz band for future technological development.

Digicel responded that demand for spectrum in the 2.5GHz band would determine if any spectrum should be reserved for future technological development.

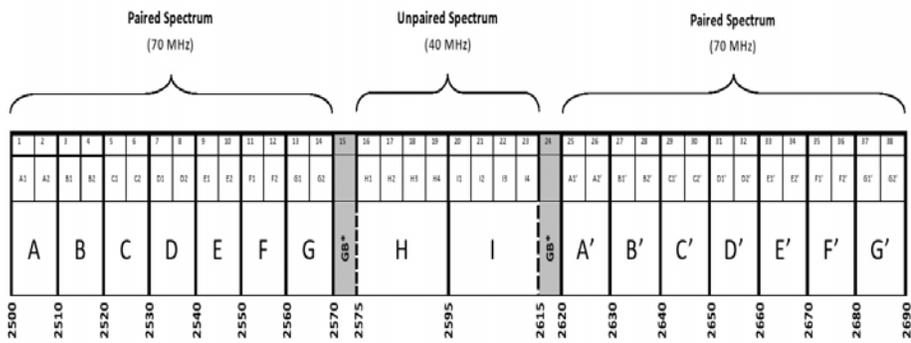
The Commission decided that unused spectrum blocks in the 2.5 GHz band would be allocated for future commercial or public safety usage if the demand arose.

### Part 3: The Policy

The Commission, pursuant to and in accordance with its mandate over spectrum management under the Telecommunications Ordinance, the Frequency Management Regulations and the Turks and Caicos Islands Table of Frequency Allocations, establishes the following policy for allocation and assignment of spectrum for the deployment of advance LTE mobile broadband services in the 2.5GHz band (2500MHz-2690MHz):

#### Channel Plan Allocation

The 2.5GHz band spectrum frequencies are allocated for mixed FDD and TDD technology usage in accordance with the following channel plan:



\*GB - Guard Band

The spectrum channel blocks available for immediate commercial usage are set out in the following table:

<i>Available for Immediate Commercial Use</i>				
<i>Block</i>	<i>Technology</i>	<i>Pairing</i>	<i>Frequency</i>	<i>Total MHz</i>
<i>A + A'</i>	<i>FDD</i>	<i>Paired</i>	<i>2500-2510MHz / 2620-2630 MHz</i>	<i>10+10=20 MHz</i>
<i>B + B'</i>	<i>FDD</i>	<i>Paired</i>	<i>2510 -2520 MHz /2630-2640 MHz</i>	<i>10+10=20 MHz</i>
<i>C + C'</i>	<i>FDD</i>	<i>Paired</i>	<i>2520 - 2530 MHz/2640-2650 MHz</i>	<i>10+10=20 MHz</i>
<i>D + D'</i>	<i>FDD</i>	<i>Paired</i>	<i>2530 – 2540MHz / 2650-266 MHz</i>	<i>10+10=20 MHz</i>
<i>E + E'</i>	<i>FDD</i>	<i>Paired</i>	<i>2540-2550 MHz / 2660-2670MHz</i>	<i>10+10=20 MHz</i>
<i>F + F'</i>	<i>FDD</i>	<i>Paired</i>	<i>2550 -2560MHz /2670 -2680 MHz</i>	<i>10+10=20 MHz</i>
<i>G + G'</i>	<i>FDD</i>	<i>Paired</i>	<i>2560-2570MHz / 2680-2690 MHz</i>	<i>10+10=20 MHz</i>
<i>H</i>	<i>TDD</i>	<i>Unpaired</i>	<i>2575MHz - 2595 MHz</i>	<i>20 MHz</i>
<i>I</i>	<i>TDD</i>	<i>Unpaired</i>	<i>2595 MHz – 2620 MHz</i>	<i>20 MHz</i>
<i>Guard band(GB)</i>		<i>Unpaired</i>	<i>2570-2575 MHz / 2615 -2630MHz</i>	<i>5 + 5 = 10MHz</i>
<b><i>TOTAL</i></b>				<b><i>180 MHz</i></b>

Unused channel blocks may be allocated for future commercial use or public safety use as the demand arises.

### **Spectrum Assignment Methodology**

Spectrum frequencies in the 2.5GHz band will be assigned to applicants on a “first-come, first-served” basis.

### **Spectrum Assignment Cap**

A cap of 40MHz bandwidth is established for assignments of spectrum to each applicant in the 2.5GHz band. Additional spectrum frequencies may be assigned to an applicant on a case-by-case basis.

## Spectrum Licence Fees

The licence fees established for assignments of spectrum in the 2.5GHz band are set out in the following table:

<b>2.5 GHz (2500MHz- 2690MHz) Spectrum Licence Fees (by Block)</b>			
<b>Block(s)</b>	<b>Total Spectrum</b>	<b>Pairing</b>	<b>Annual Fee</b>
<b>A+A'</b>	<i>10+10=20 MHz</i>	<i>Paired</i>	<i>\$30,000</i>
<b>B + B'</b>	<i>10+10=20 MHz</i>	<i>Paired</i>	<i>\$30,000</i>
<b>C + C'</b>	<i>10+10=20 MHz</i>	<i>Paired</i>	<i>\$30,000</i>
<b>D + D'</b>	<i>10+10=20 MHz</i>	<i>Paired</i>	<i>\$30,000</i>
<b>E + E'</b>	<i>10+10=20 MHz</i>	<i>Paired</i>	<i>\$30,000</i>
<b>F + F'</b>	<i>10+10=20 MHz</i>	<i>Paired</i>	<i>\$30,000</i>
<b>G + G'</b>	<i>10+10=20 MHz</i>	<i>Paired</i>	<i>\$30,000</i>
<b>H</b>	<i>20 MHz</i>	<i>Unpaired</i>	<i>\$30,000</i>
<b>I</b>	<i>20 MHz</i>	<i>Unpaired</i>	<i>\$30,000</i>

*\* Note that the fees are currently applied on a paired spectrum basis.  
 \*\* The estimated 2010 population of TCI is 38,400. Source: World Bank*

## Spectrum Licence Conditions

Licences for assignment of spectrum in the 2.5GHz shall contain the following conditions:

Deployment Requirements:

- The licensee must commercially deploy advance LTE mobile broadband services within 18 months of the issuance of the spectrum licence.
- The licensee must cover 98% of the population of TCI with advance LTE-based mobile broadband services within 36 months of the issuance of the spectrum licence.

Reporting Requirements:

- The licensee must file an LTE mobile broadband service deployment status report with the Commission after 18 months, 36 months and every 2 years following the issuance of the spectrum licence.

## Implementation Date

Applications for assignment of radio frequencies in the 2.5GHz spectrum band for the deployment of advance LTE mobile broadband services will be processed on a first-come, first-served basis commencing on the publication date of this policy.



**Public Consultation on the Establishment of a  
Policy for Assignment of Spectrum in the 2.5GHz Band  
(2500MHz - 2690MHz)  
Publication 7, MAY 2015**

## **Objective of the Consultation**

Following an application received from Andrew's Communications Ltd. (Trading as People's Telecoms Company Ltd) for assignment of spectrum in the 2.5GHz Band, using the Band 41 Plan (**Public Notice 2015-3**<sup>1</sup>), the Commission wishes to conduct a public consultation on the allocation of the 2.5GHz Band and the assignment of spectrum in that band.

The consultation examines modalities of allocation and assignment of frequencies in the 2.5GHz Band that are consistent with internationally accepted approaches for such allocation and assignments.

The Commission intends to develop a policy for the allocation and assignment of frequencies in the 2.5GHz Band based on the result of this consultation.

## **The 2.5GHz Spectrum Band**

2.5GHz Band is used to provide access to fixed and mobile wireless broadband services using the International Telecommunication Union ("ITU") recommendations (ITU-R F 1243) for access to wireless services operating in bands 2290 to 2670MHz.

Because of continuing evolutions by commercial operators in the development and deployment of new and innovative wireless technologies to provide higher data rates to consumers, the 2000 World Radio-communication Conference (WRC) allocated the 2.5/2.6GHz bands (2500 to 2690 MHz) on a primary basis in all ITU regions for the implementation of the terrestrial component of International Mobile Telecommunications (IMT).

In 2011, following on the recommendations of the ITU for the allocation of the 2.5 GHz Band for IMT services in Region 2, which includes the TCI, the Commission made provision in the Turks and Caicos Islands Table of Frequency Allocations for the allocation of fixed and mobile wireless broadband services on a primary basis in the 2.5GHz Band.

## **Channelization of the 2.5GHz Band**

The ITU recommends two options for the arrangement of the 2.5GHz Band for administrations wishing to implement it for IMT. The first option, the Band Plan option, consists of preconfigured allocations of paired and unpaired spectrum most commonly adopted worldwide. A second option is for administrations wishing to use the 2.5GHz Band solely for FDD or TDD. For the deployment of mixed FDD/TDD, however, the first option, the Band Plan option, is recommended<sup>2</sup>.

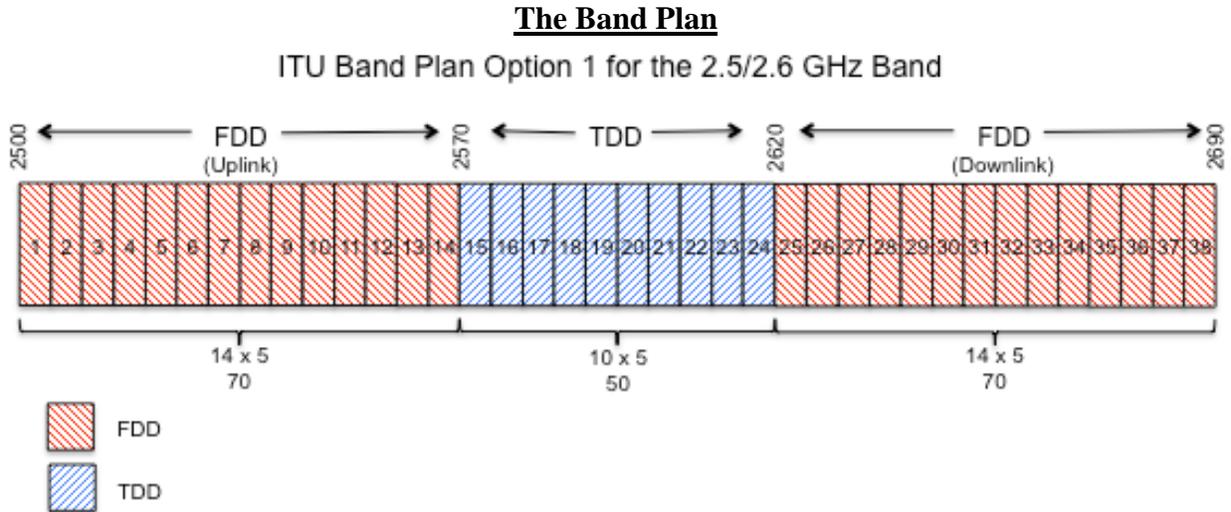
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<sup>1</sup> PN 2015-3 ACL application for spectrum, posted on the TCI Telecommunications Commission website

<sup>2</sup> ITU-RM.1036-4

## The Band Plan Option

The Band Plan consists of 38 five MHz spectrum blocks with a fixed combination of paired and unpaired spectrum. It provides 140MHz of paired spectrum for FDD operations and a 50MHz block of unpaired spectrum for TDD operations in the centre. Block 15, between the TDD block and the FDD uplink channels, is designated as a guard band. The use of 5MHz channel blocks allows combining blocks for channel widths of 5, 10, 15 and 20MHz – in accordance with 3GPP specifications for LTE and other technologies.



To be consistent with the ITU recommendations for Region 2 and the assignment of spectrum in the 2.5GHz Band by neighbouring states, the Commission is inclined to use the Band Plan option. [Although Cable and Wireless/LIME are presently licensed to provide legacy fixed point-to-point or fixed point-to-multipoint services using paired channels in the 2.5GHz band (2511.500MHz and 2630.500MHz), using 7MHz channel blocks, those frequencies are not in use, and the Commission is willing to compensate LIME with alternative frequencies.]

## **Band Plan Models**

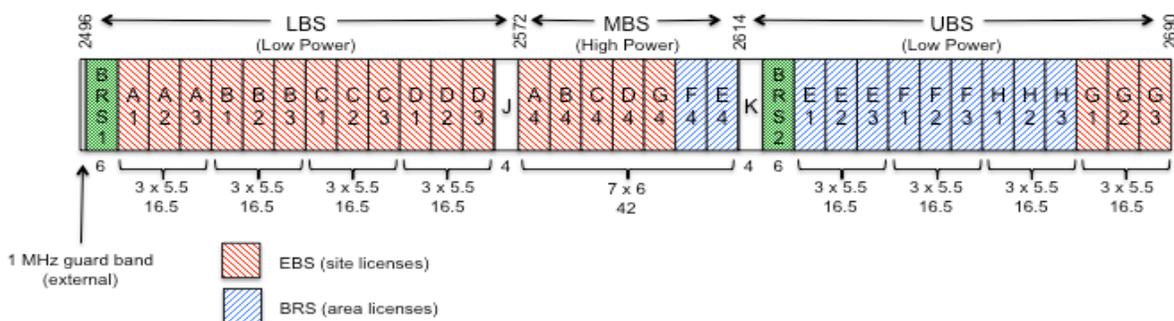
The Commission is considering two Band Plan models for the assignment of spectrum to service providers wishing to deploy advanced LTE services in the TCI.

### **Band Plan Model 1:**

This model follows the format used for the FCC 2.5GHz Band in the US. It divides the band into 33 channels – 20 EBS and 13 BRS – comprised of 186MHz of spectrum divided into three sub-bands, separated by two 4 MHz guard bands (J and K blocks) comprising the remainder of the allocation. The upper band segment (UBS) and lower band segment (LBS) are set aside for low-power cellular transmissions. The mid-band segment (MBS) is set aside for legacy fixed point-to-point or fixed point-to-multipoint services. [This would enable LIME to maintain their fixed point-to-point or fixed point-to-multipoint services within the 2.5GHz band.]

## Band Plan Model 1

Band Plan for the 2.5 GHz spectrum in the US



## Band Plan Model 2

This plan divides the 2.5GHz Band into 38 channels bandwidths of 5MHz that allow combining blocks for channel widths of 5,10,15 and 20MHz using FDD or TDD technology.

## Band Plan Model 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	
A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	I1	I2	J1	J2	K1	K2	L1	L2	M1	M2	N1	N2	O1	O2	P1	P2	Q1	Q2	R1	R2	S1	S2	
20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		20 MHz		
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S																				
2500	2510	2520	2530	2540	2550	2560	2570	2580	2590	2600	2610	2620	2630	2640	2650	2660	2670	2680	2690																			

## Pricing of 2.5GHz Spectrum Band

The 2.5GHz Band is considered valuable because of propagation characteristics that enable radio-communication systems operating in this band to cover wide geographical areas and achieve high levels of indoor penetration with relatively few base stations. These characteristics are particularly desirable in broadband communications. Also, the cost of building a network using 2.5GHz is substantially less than the cost of building a similar network using higher frequencies.

In 2012 the Commission established a policy for pricing 700MHz spectrum for LTE deployment where the cost was based on prime and non-prime usage (\$/MHz-pop)<sup>3</sup>. See Table 1:

<b>Spectrum Band</b>	<b>Annual Fee *</b>	<b>Annual Fee/MHz/pop **</b>
<b>700 MHz Prime</b>	\$30,000 / 12MHz	6.9¢
<b>700 MHz Non-Prime</b>	\$20,000 /12Mhz	4.3¢
<b>850 MHz</b>	\$30,000 / 10MHz	3.9¢
<b>900 MHz</b>	\$30,000 / 10MHz	3.9¢
<b>1800 MHz</b>	\$40,000 / 10MHz	5.2¢
<b>1900 MHz</b>	\$78,000 / 5MHz	20.3¢
<b>Average</b>		<b>8.3¢</b>

\* Note that the fees are currently applied on a paired spectrum basis.

\*\* The estimated 2010 population of TCI is 38,400. Source: World Bank

Because lower frequency bands provide better penetration and coverage than higher frequency bands the Commission proposes that the price for LTE Advance spectrum in the 2.5GHz Band should be similar to the cost of non-prime spectrum in the 700 MHz Band (4.3¢ MHz/pop). See Table 2:

<b>Spectrum Band</b>	<b>Annual Fee</b>	<b>Annual Fee MHz/pop</b>
2.5GHz (A1-S2)	\$8000 / 5 MHz	4.3¢
2.5GHz (A1-S2)	\$16000 / 10MHz	4.3¢
2.5GHz (A1-R2)	\$24000 /15MHz	4.3¢
2.5GHz (A-R)	\$32000 / 20MHz	4.3¢

## **Pro and Cons**

Most regions have yet to implement the ITU recommendations for deployment of LTE/IMT services in the 2.5GHz Band and retain the traditional channelization used for legacy systems (ITU-R F1243). China, Japan and the USA, have recently rearranged the 2.5GHz Band in their jurisdictions using the Band Plan (Band 41) for LTE Advance broadband services. This deployment has the potential of making equipment more affordable and furthering the proliferation of broadband mobile devices, such as smartphones and tablets, that operate in the 2.5GHz Band.

The options recommended by the ITU for arrangement in the 2.5GHz Band have advantages and disadvantages. Because of the recent arrangement of 2.5GHz spectrum in the United States, it is possible, perhaps likely, that over the coming years, telecommunications providers within our region will develop and deploy new equipment designed to operate within the 2.5GHz for IMT

<sup>3</sup> DN 2012-7, Spectrum Policy Decision for 700MHz, posted on the TCI Telecommunications Commission website

services set by ITU. On the other hand, the traditional channelization of the 2.5GHz Band for legacy point to multipoint is long dated in the telecommunications industry and therefore the equipment designed to operate in this spectrum is likely to be usable within the parameters of the traditional channelization.

## **Consultation**

The Commission invites comments generally on the application of Andrew's Communications Ltd. (Trading as People's Telecoms Company Ltd) for assignment of spectrum in the 2.5GHz Band, using the Band 41 Plan (**Public Notice 2015-3**), but would also appreciate comments regarding the following specific issues:

1. The Commission prefers the use of TDD technology that uses a single, wider channel over the two narrower channels used in FDD technology. TDD appears to provide operators with flexibility for more efficient and intensive use of the 2.5GHz Band. The Commission therefore proposes to allocate the 2.5GHz Band based on TDD technology, dividing the band into 38 channels of 5MHz bandwidths, which allows combining blocks for channel widths of 5,10,15 and 20MHz.

### ***Question 1:***

***Do you agree that the 2.5GHz spectrum should be channelized based on TDD/IMT technology with channels of 5,10,15 and 20MHz bandwidth each?***

2. In keeping with technology neutrality, the Commission proposes that the majority of the band be designated for assignment to providers who could use any technology of their choosing to deliver the broadband wireless services.

### ***Question 2:***

***Do you agree with the proposal that service providers may use technology of their choice in delivering broadband wireless services within the band?***

3. The Commission is seeking specific spectrum usage information from current commercial mobile licensees and other entities interested in acquiring commercial mobile spectrum:

### ***Question 3:***

- (1) ***What is your need for additional spectrum for commercial mobile services applications and how much spectrum do you require?***
- (2) ***What deployment timelines are being considered?***

- (3) What types of applications/uses are envisaged?*
- (4) How much of your anticipated spectrum needs be addressed by having access to the 2.5GHz Band?*

- 4. In the future the Commission proposes to award an optimum amount of spectrum for delivery of allocated services in the TCI.

**Question 4:**

*Do you agree with the Commission's proposal that providers be awarded an optimum amount of spectrum for provision of services in the TCI? If you disagree, please provide a framework for the Commission to determine the amount of spectrum bandwidth to award to potential licensees*

- 5. The Commission proposes that a portion of the 2.5GHz Band be designated for Public Health and Safety Services and seeks the views of all stake holders, including public safety agencies on this proposal

**Question 5:**

- (1) Do public safety agencies need spectrum for broadband applications?*
- (2) How much and for what type of applications?*
- (3) What are the anticipated deployment plans and possible constraints in implementing these applications?*
- (4) Is there suitable spectrum other than 2.5GHz spectrum to meet these broadband requirements?*

- 6. Spectrum in the TCI has traditionally been assigned on a first come first-served basis. An alternative method of assignment would be a comparative selection method.

**Question 6:**

*In the case of the 2.5GHz spectrum do you think that the traditional first-come, first-served method of assigning spectrum is appropriate, or would it be preferable to use a comparative selection method?*

- 7. The Commission proposes that the price of the 2.5GHz Band be set at the cost of the non-prime spectrum of the 700 MHz Band (4.3¢ MHz/pop).

**Question 7:**

*Do you agree that the 2.5GHz price be set at the price of the non-prime spectrum of the 700 MHz Band (4.3¢ Mhz/ pop)? If not, what pricing do you propose?*

8. The Commission proposes to reserve some spectrum in the 2.5GHz Band for future technological development.

***Question 8:***

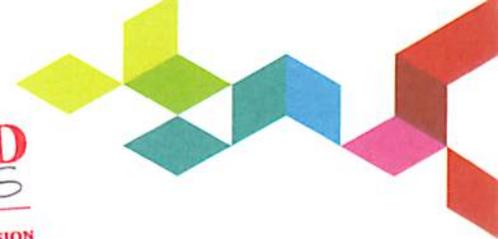
***Do you consider that it is appropriate to reserve any channels of the 2.5 GHz Band for future use?***

## **Responses to Consultation**

Comments should be submitted to the Commission within 3 weeks of the publication of this document, at their office at Business Solutions Building, Leeward Highway, Providenciales, Turks and Caicos Islands, or by mail to P.O. Box 203, Providenciales, Turks and Caicos Islands, or electronically via email at [consultations@tcitelecommission.tc](mailto:consultations@tcitelecommission.tc). Submissions should be filed electronically as well as in paper form. The submission deadline is May 29, 2015.

Any person may submit comments in reply to any matters contained in submissions filed with the Commission by the stipulated deadline of May 29, 2015. Such reply comments must be filed with the Commission in the manner described above by 3:30 PM, Friday, June 5, 2015.

**RECEIVED**  
 5-29-2015  
 DATE  
 TCI TELECOMMUNICATIONS COMMISSION



**Digicel**

29<sup>th</sup> May 2015

Advance copy by email to [consultations@tcitelecommission.tc](mailto:consultations@tcitelecommission.tc).

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Dear Sir/Madam,

**Re: Submissions in response to the Commission's queries.**

**(1) PN 2015 -3 Andrew's Communications Ltd. \_ Application for Spectrum**

The Commission has invited the public to generally comment on Andrew's Communications Ltd's (Trading as People's Telecoms Company Ltd) application for assignment of spectrum in the 2.5GHz Band. Digicel does not expressly oppose Andrew Communications Ltd's application, however, we are concerned at the amount of spectrum being sought by the applicant and would recommend that the Commission exercises caution when considering any application on 2.5 GHz band as the same has primarily been allocated for cellular mobile broadband services by the ITU. As the Commission may be aware, the Federal Communications Commission (FCC) rearranged the band in 2004 in an effort to make it more suitable for cellular mobile broadband services.

Digicel submits that the application for Andrew Communication Limited should be considered in line with the ITU's recommendation and only after the Commission's Consultation for Assignment of Spectrum in the 2.5GHz band is concluded. Digicel responds as hereunder with regard to that Consultation for Assignment.

**(2) PN 2015-7 - Assignment of Spectrum in the 2.5GHz Band**

Digicel welcomes this opportunity to comment on the proposed policy for spectrum allocation in the 2.5GHz band.

As an overarching position we would express that there is a need for regional alignment of spectrum planning. This aligned approach is more likely to result in lower process for end-user



device arising from scale efficiencies and lower operator costs for similar reasons. This mirrors the positions outlined by the Commission in the Consultation document.

Given the significant volume of inbound roamers to the region and the revenues that accrue to both the private and public sectors from these roamers where there is a choice there is also an incentive to align local allocations with the largest source market(s) for these roamers. In the case of the region this is North America (US and Canada).



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Spectrum allocations underpin long term infrastructure investment and are difficult to unpick once made. Radio spectrum is a scarce national resource and may be considered a public good. In light of this, while short term demand and/or usage may yield perceived gains in the short term, in the longer term they may act a “blocks” to the effective and efficient deployment of services which yield overall greater and more sustainable consumer and economic benefits. For this reason in general we also favour comparative allocation mechanisms with a medium to long term assessment horizon.

We note in particular the Commission’s proposal to award an optimum amount of spectrum, and that the exact definition of what criteria might be used to determine what is optimum have not been consulted on as part of this consultation. We can only assume that the Commission envisages a second round of consultation should it decide to proceed with the “optimum award” approach in order to fully define the criteria.

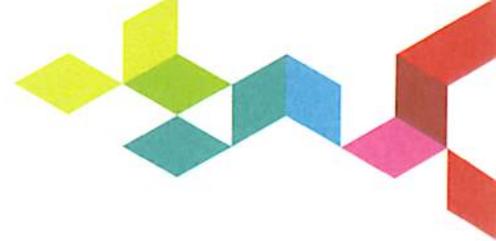
Given that this second stage appears to have been already contemplated there would be only limited procedural delay in conduction a combined consultation which also assessed the parameters for a comparative award process.

Our responses to the individual consultation questions are set out below. Should the Commission require additional clarification or expansion on any of our responses we are more than happy to provide this.

**Question 1:**

***Do you agree that the 2.5GHz spectrum should be channelized based on TDD/IMT technology with channels of 5, 10, 15 and 20MHz bandwidth each?***

Digicel supports the Commission’s proposal to use an approach based on TDD/IMT. However we believe that block size of 20MHz is more appropriate for operators intending to use mobile based LTE technology. Given the primary designation of the band for International Mobile Telecommunications [emphasis added] we believe that this should be given some weight by the Commission in making a decision.



**Question 2:**

***Do you agree with the proposal that service providers may use technology of their choice in delivering broadband wireless services within the band?***

**Digicel**

While in general we support the concept of technology neutrality we would point out the LTE is likely to be the preferred technology for operators going forward. This, coupled with the primary designation for IMT means that choices regarding channelisation etc. within the band should be weighted towards the requirements of LTE to the extent that other technologies are consistent with the LTE requirements we do not see an objective reason to preclude these technologies.

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**Question 3:**

***(1) What is your need for additional spectrum for commercial mobile services applications and how much spectrum do you require?***

At this time our network and service evolution plans would require 1 x 60 MHz for LTE TDD in the 2.6 GHz band.

**Question 3:**

***(2) What deployment timelines are being considered?***

At this time we would envisage deploying mobile LTE technology in this band commencing in 2016.

**Question 3:**

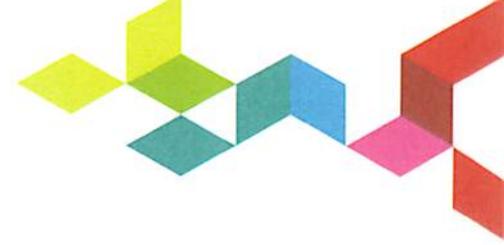
***(3) What types of applications/uses are envisaged?***

At this time we foresee using of this spectrum for mobile and fixed wireless broadband.

**Question 3:**

***(4) How much of your anticipated spectrum needs be addressed by having access to the 2.5GHz Band?***

Having access to this spectrum would allow for the expansion of existing broadband services and will support broadband services on mobile devices going forward as these devices become capable of supporting these frequencies.



**Digicel**

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**Question 4:**

***Do you agree with the Commission's proposal that providers be awarded an optimum amount of spectrum for provision of services in the TCI? If you disagree, please provide a framework for the Commission to determine the amount of spectrum bandwidth to award to potential licensees***

It is not clear what criteria are proposed to determine what is an "optimum" amount of spectrum. For example awarding one operator an "optimum" amount of spectrum to implement a particular network solution could squeeze out other operators or inhibit an "optimum" allocation to them. At high levels of network capacity requirement "fixed" broadband might be more efficiently delivered using "fixed" infrastructure rather than an excess use of spectrum within a band primarily intended for International **Mobile** Telecommunications. In this regard Digicel believes that in assessing "optimum" should assess any applicant's ability in the medium to long term to meet high levels of user end user demand for fixed broadband using "fixed" network resources. Similarly the Commission should assess the extent to which an applicant intends to use any allocation for its primary designated use.

As the Commission points out in its Consultation: *"China, Japan and the USA, have recently rearranged the 2.5GHz Band in their jurisdictions using the Band Plan (Band 41) for LTE Advance broadband services. This deployment has the potential of making equipment more affordable and furthering the proliferation of broadband mobile devices, such as smartphones and tablets, that operate in the 2.5GHz Band";*

and that

*"Because of the recent arrangement of 2.5GHz spectrum in the United States, it is possible, perhaps likely, that over the coming years, telecommunications providers within our region will develop and deploy new equipment designed to operate within the 2.5GHz for IMT services set by ITU."*

In the context of the Commission's own analysis, which Digicel agrees with, Digicel submits that "optimum" allocations are those which favour operators proposing to credibly deploy mobile services in the band. Disproportionately large, long term, allocations to operators proposing to deploy "fixed" only services which will effectively sterilise the use of tranches of this band by domestic mobile users and by inbound roamers cannot be considered optimum.

**Question 5:**

***(1) Do public safety agencies need spectrum for broadband applications?***



At this time Digicel cannot identify any requirements for public safety agencies to build separate broadband networks using spectrum in this band.

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**Question 5:**

***(2) How much and for what type of applications?***

Please see response to Question 5(1)

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**Question 5:**

***(3) What are the anticipated deployment plans and possible constraints in implementing these applications?***

Please see response to Question 5(1)

**Question 5:**

***(4) Is there suitable spectrum other than 2.5GHz spectrum to meet these broadband requirements?***

Given the relative propagation characteristics of both the 2.5GHz band and the 700MHz band we believe that even if such a requirement could be identified it would be more appropriate to consider reserving Band 14 in the 700 MHz band for this purpose.

**Question 6:**

***In the case of the 2.5GHz spectrum do you think that the traditional first-come, first-served method of assigning spectrum is appropriate, or would it be preferable to use a comparative selection method?***

Digicel considers that a simple "first come, first served" approach would not allow be compatible with the proposal put forward by the Commission to award an "optimum" amount of spectrum. This is because any assessment of the "optimum" amount of spectrum would require assessing whether any short term proposed usage for the requested allocation would be compatible with the long term efficient and effective use of the spectrum.



**Digicel**

An award which only looked at a single operator's short term requirements would only yield an outcome which was optimum for that single operator and would almost certainly yield sub-optimal outcomes for consumers and other spectrum users in the medium to long term. It is unlikely to meet regulatory policy objectives. In particular the primary designation of the band for mobile telecommunications would require an assessment of whether it was optimum to make a substantial or longer term allocation to fixed only use.

In light of these considerations Digicel believes that a comparative allocation process is required in order to meet spectrum management policy objectives. The exact design of any process could include measures to discourage regulatory gaming.

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**Question 7:**

***Do you agree that the 2.5GHz price be set at the price of the non-prime spectrum of the 700 MHz Band (4.3¢ Mhz/ pop)? If not, what pricing do you propose?***

Given the relative propagation characteristics of radio frequencies at 700MHz compared to 2.5GHz where, as the Commission points out in its Consultation "...lower frequency bands provide better penetration and coverage than higher frequency bands..." Digicel believes that allocations in the 2.5GHz band should be priced at a significant discount to frequencies in the 700MHz band. This approach is consistent with the technical characteristics and consequent commercial realities that the Commission itself has set out.

**Question 8:**

***Do you consider that it is appropriate to reserve any channels of the 2.5 GHz Band for future use?***

Digicel is of the view that if there is sufficient justified demand for spectrum in this band at this time then the entire band should be allocated to meet this demand. To do otherwise would inhibit technology and service deployment for some unquantified potential future benefit.

Yours Sincerely,

Erik Staaf

CEO

# UPGRADE TURKS & CAICOS

**RECEIVED**  
*June 5 2015*  
 DATE  
 TCI TELECOMMUNICATIONS COMMISSION  
*K.A.*



5 June 2015

Mr. John Williams  
 Director General  
 TCI Telecommunications Commission  
 P.O Box 203  
 872 Business Solutions Building  
 Leeward Highway  
 Providenciales  
 Turks & Caicos Islands

Dear Mr. Williams,

**Re: PN 2015-7 – Assignment of Spectrum and the 2.5 GHz Band**

1. Cable and Wireless (TCI) Limited, trading as LIME (“**LIME**”) thanks the Commission for this opportunity to respond to the comments filed by Digicel TCI Limited (“**Digicel**”) on 29 May 2015 in the *Public Consultation on the Establishment of a Policy for Assignment of Spectrum in the 2.5GHz Band (2500MHz - 2690MHz)* issued on 7 May 2015 (“**the Consultation**”), and to the application by Andrew’s Communications Limited (“**Andrews**”) for 2.5 GHz spectrum included in Public Notice 2015-3 issued on 11 March 2015 (“**the Public Notice**”). LIME does not generally object to Digicel’s comments, but would offer the following comments on them.

### Choice of Band Plan

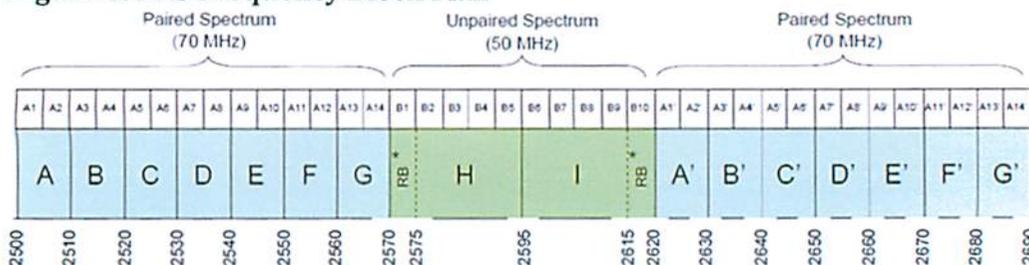
2. It is not entirely clear which of the two proposed band plans is supported by Digicel. LIME suspects it is Band Plan Model 2, based on Digicel’s comments about 20 MHz blocks. Based on the request for 20 MHz blocks in the Public Notice, LIME believes Andrews would also support Band Plan Model 2. LIME recommends that, if the Commission adopts Band Plan Model 2, it should specify which blocks are to be paired and which are to be unpaired. LIME notes that this is how Industry Canada has set out their 2.5 GHz band plan.<sup>1</sup> A band plan which allows any given block to be paired with any other block is unlikely to be functional, as manufacturers are likely to develop devices that use very specific pairing of frequencies.

<sup>1</sup> See “Licensing Framework for Broadband Radio Service (BRS) — 2500 MHz Band”, available at <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10726.html#p3.2>

**Table 1 — BRS Frequency Blocks**

Block	Frequencies	Total Spectrum	Pairing
A / A'	2500-2510 MHz / 2630 MHz	10 + 10 MHz	paired
B / B'	2510-2520 MHz / 2640 MHz	10 + 10 MHz	paired
C / C'	2520-2530 MHz / 2650 MHz	10 + 10 MHz	paired
D / D'	2530-2540 MHz / 2660 MHz	10 + 10 MHz	paired
E / E'	2540-2550 MHz / 2670 MHz	10 + 10 MHz	paired
F / F'	2550-2560 MHz / 2680 MHz	10 + 10 MHz	paired
G / G'	2560-2570 MHz / 2690 MHz	10 + 10 MHz	paired
H	2570-2595 MHz	25 MHz (includes 5 MHz restricted band)	unpaired
I	2595-2620 MHz	25 MHz (includes 5 MHz restricted band)	unpaired

**Figure 6: BRS Frequency Block Plan**



- It is also not clear whether, if the Commission were to adopt the Band Plan Model 1, it would also adopt the “Broadband Radio Service (BRS)” or “Educational Broadcasting Service (EBS)” designations used by the FCC. LIME recommends that the Commission not adopt the “EBS” designation, i.e. that the entire band be used for the “Broadband Radio Service” as it is, for example, in Canada. In this regard, we also agree with Digicel’s comments that the Commission should put emphasis on mobile applications when considering the band plan for the 2.5 GHz Band.

Size of Spectrum Award

- LIME views with concern the amount of spectrum being requested by Andrews (100 MHz) and in which Digicel is expressing interest (60 MHz). Assigning this amount is excessive and unnecessary and is unlikely in this particular case to be “optimal” for the Turks and Caicos Islands. It is also unclear how a 60 MHz or 100 MHz TDD spectrum assignment would fit into the 50 MHz set aside for TDD operations in the ITU and Canadian band plans or the 42

MHz set aside in the "middle band segment" of the FCC band plan. We note that Industry Canada has set a cap of 40 MHz for assignments in the 2.5 GHz band (with a few exceptions for the far North of the country).

#### Spectrum Fees

5. LIME agrees with Digicel that spectrum in the 2.5 GHz band should be priced at a discount to spectrum in lower bands. In this regard, the Commission should not adopt any price above US\$ 0.043 per MHz per pop. It may be more appropriate to price it at US\$ 0.039 per MHz per pop, to match the price of 850 and 900 spectrum.
6. LIME notes that the price for 1900 MHz spectrum is significantly higher than any other spectrum, and most importantly, than the highly-valued premium 700 MHz spectrum. It is so high, in fact, that the "average" price for spectrum ends up exceeding the price for premium spectrum. In our view, this is unacceptable and indefensible, and LIME recommends that the Commission begin immediately the process to re-align the fees for 1900 MHz spectrum so that they match the fees for functionally similar spectrum.

#### Reallocation of Frequencies

7. LIME notes the adoption of a new band plan for the 2.5 GHz band would amount to a reallocation of that band, and LIME notes the Commission's observations on prior assignments to LIME in the 2.5 GHz band. LIME is prepared to discuss with the Commission alternative assignments that would meet its needs. Those discussions would include, if applicable, the applicability of regulation 7 of the *Frequency Management Regulations*.

#### Conclusion

8. Should the Commission have any questions or concerns in respect of any of the foregoing, please feel free to contact the undersigned and we would be happy to meet to discuss the matter further.

Best Regards,



**James Pitt**  
Country Manager