



**Second  
700 MHz Spectrum Policy  
Consultation Document**

**issued by the**

**Turks and Caicos Islands  
Telecommunications Commission**

**on**

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# 1 Introduction

The purpose of this Second Consultation Document is to seek interested parties' views on a revised 700 MHz spectrum<sup>1</sup> proposal (the "Revised 700 MHz Policy Proposal") developed by the Turks and Caicos Islands ("TCI") Telecommunications Commission (the "Commission"). At the conclusion of this consultation process, the Commission will issue a decision establishing TCI's 700 MHz Policy. In reaching its decision, the Commission shall take Respondents' input and comments into account.

## 1.1 Background

On 5 August 2008, the Commission received a 700 MHz spectrum licence application from Cable & Wireless (TCI) Limited, now trading under the name "LIME". LIME is a licensed public mobile telecommunications ("PMT") operator in TCI. In response, the Commission issued Public Notice 2008-4, dated 25 September 2008, to solicit comments on LIME's spectrum licence application as well as broader 700 MHz spectrum policy issues, including 700 MHz spectrum uses, block assignments, spectrum fees and timing issues. LIME was the only party to provide comments in response to that public notice.

The Commission decided at the time to defer any decisions relating to allocation and assignment of 700 MHz spectrum in TCI due to the uncertainties regarding 700 MHz spectrum policies in the region.

Last year, pursuant to sections 4(1) and 30 of the *Telecommunications Ordinance 2004* ("Ordinance") and sub-sections 4(6), (7) and (8) of the *Frequency Management Regulations 2005* ("Frequency Management Regulations"), the Commission issued a Public Consultation Document entitled *A Policy for the Assignment of 700 MHz Spectrum* (referred to herein as the "Initial Consultation Document") on 18 April 2011. The objective of the Initial Consultation Document was to solicit interested parties' views on a range of 700 MHz spectrum policy issues, including 700 MHz spectrum channelization, spectrum caps, spectrum set-asides for public safety purposes and future uses, spectrum assignment approaches and spectrum fees, among other things.

The Commission received responses to the Initial Consultation Document from the following Respondents:<sup>2</sup>

- Andrews Communications Ltd. ("Andrews")
- Digicel TCI Limited ("Digicel")
- Islandcom Telecommunications, Ltd. ("Islandcom")

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<sup>1</sup> Note that "700 MHz spectrum" refers to spectrum in the frequency band 698 – 806 MHz.

<sup>2</sup> All initial submissions received were dated 6 May 2011. LIME's reply comments were filed 13 May 2011 and ECC's comments were filed 17 May 2011.

- LIME (including initial comments and reply comments)
- The 911 Emergency Communications Center ("ECC")

In the Initial Consultation Document, the Commission asked interested parties to provide responses to eleven specific questions relating to various 700 MHz spectrum policy issues as well as any other matters interested parties deemed relevant. The Commission has carefully reviewed Respondents' submissions; however, it is of the view that further consultation is required before a decision on a 700 MHz Policy for TCI can be issued by the Commission.

Subsequent to this consultation process the Commission received 700 MHz spectrum licence applications from the two other licensed PMT operators in TCI: from Islandcom in October 2011 and from Digicel in January 2012. The Commission issued Public Notices with respect to each of these applications – i.e., Public Notice 2011-13, dated 11 November 2011, in the former case and Public Notice 2012-02, dated 9 February 2012, in the latter case. The Commission received no comments on these public notices.

Table 1 presents the specific spectrum blocks requested in the three above-noted applications (the “Applications”). Note that Islandcom indicated a first and second choice of blocks in their application.

<b>Table 1: Summary of 700 MHz Applications by licensed PMT operators</b>						
<b>Block</b>	<b>Frequency (MHz)</b>	<b>Total MHz</b>	<b>Lime</b>	<b>Digicel</b>	<b>Islandcom</b>	
					<b>(1st choice)</b>	<b>(2nd choice)</b>
Lower A	698-704 /728-734	12 MHz				
Lower B	704-710 /734-740	12 MHz				
Lower C	710-716 / 740-746	12 MHz				
Upper C	746-757 /777-788	22 MHz				
<b>Total</b>		<b>70 MHz</b>	<b>22 MHz</b>	<b>36 MHz</b>	<b>22 MHz</b>	<b>24 MHz</b>

Table 1 indicates that based on the Applications from existing licensed PMT operators (the “Applicants”), there is significant and overlapping demand for 700 MHz spectrum in TCI to deploy 4<sup>th</sup> generation (“4G”) mobile broadband wireless services. In this context, the purpose of this Second Consultation Document, therefore, is to seek interested parties' views on the Revised 700 MHz Policy Proposal set out in below, which is based on the input provided by Respondents to the Initial Consultation Document as well as regional considerations and international developments.

## 1.2 Consultation and Process

Pursuant to the *Telecommunications (Administrative Procedure) Regulations* 2008, the Commission is initiating the present consultation process to seek comment on the Revised 700 MHz Policy Proposal.

The Commission notes that it has engaged the services of Consultants to assist it with this consultation process, including the analysis and assessment of the submissions of Respondents in

response to the Initial and the present Consultation Document as well as the design and formulation of the Revised 700 MHz Policy Proposal.

The Commission invites interested parties to provide their input and comments (“Responses”) with respect to the issues raised and Revised 700 MHz Policy Proposal included in this Second Consultation Document as well as any other issues of relevance to the establishment of an appropriate 700 MHz Policy for TCI.

This Second Consultation Document, along with all referenced Government and Commission documents, is available on the Commission’s website at <http://www.telecommission.tc>. Respondents who wish to provide input and comments on this Second Consultation Document are invited to submit their Responses in writing to the Commission. Responses shall also be submitted in electronic form to facilitate further distribution and posting on the Commission’s website.

This consultation process is structured in two phases. In the first phase, Respondents may submit Initial Responses to comment on this Second Consultation Document. In the second phase, Respondents may submit Reply Responses to comment on the Initial Responses of other Respondents in whole or part.

The filing deadlines for Initial Responses and Reply Responses are as follows:

- Initial Responses must be received by the Commission no later than 3:30 p.m. local time on **Monday, June 25, 2012**.
- Reply Responses must be received by the Commission no later than 3:30 p.m. local time on **Monday July 9, 2012**.

Responses filed in relation to this Second Consultation Document may be submitted to one or more of the following addresses:

- a) E-mail to: [consultations@tcitelecommission.tc](mailto:consultations@tcitelecommission.tc)
- b) Delivery (paper and electronic copy) by hand or by courier to:

Mr. John Williams,  
Director General  
Turks and Caicos Islands Telecommunications Commission  
Business Solutions Complex, Leeward Highway  
Providenciales,  
Turks and Caicos Islands

The Commission welcomes all Responses on this Second Consultation Document. The Commission invites Respondents to provide responses to the specific numbered questions (the “Consultation Questions”) and any other issues Respondents consider relevant.

The Commission encourages Respondents to support all Responses with relevant data, analysis, and information based on the TCI situation or on the experience of other countries to support their comments. The Commission may give greater weight to Responses supported by appropriate evidence. In providing their comments, Respondents are requested to indicate the number of the Consultation Question(s) to which each comment relates. Respondents are not required to comment on all Consultation Questions. The Commission is under no obligation to adopt the views or proposals of any Respondent.

Copies of all submissions filed by Respondents in relation to this Second Consultation Document will be published on the Commission’s website at <http://www.telecommission.tc>. With a view to having as open public consultation process as practical, the Commission encourages Respondents to structure their Responses not to include any confidential information. If necessary, Respondents may submit Responses that include claimed confidential information in the form of two Responses:

- **Redacted Response** - In this document any claimed confidential information would be excluded. The other comments and information, not claimed as confidential, would be included in this version. This is the public version document that would be posted on the Commission website;
- **Confidential Response** – This document would be identical to the Redacted Response. except that this version would also include the claimed confidential information for the use of the Commission. This document would not be posted on the Commission website.

Claims of confidentiality will be determined by the Commission on a case-by-case basis, and in compliance with the requirements set out in Section 19 of the Administrative Regulations.

### 1.3 Overall Timeline

Table 2 summarizes the timeline for this consultation process and the subsequent decision-making.

<b>Event</b>	<b>Date</b>
Commission issues Second Consultation Document	May 29, 2012
Initial Responses from Respondents	June 26, 2012
Reply Responses from Respondents	July 10, 2012
Commission Decision	August, 2012 (estimated)

## 2 Policy Context and Regional Standards

### 2.1 TCI Policy Context

The Government's *Telecommunications Policy for the Turks and Caicos Islands 2003* ("the Telecommunications Policy") recognized that radio spectrum is a critical economic resource which must be effectively managed and efficiently used. Specifically, the Telecommunications Policy states that modern spectrum management requires, among other things, the development and maintenance of a strategic legal and technical framework that ensures (i) timely access to spectrum for new services and technologies and (ii) economically and technically efficient spectrum use.

Section 39 of the Ordinance expands on these principles and objectives by setting out spectrum planning guidelines for the Commission to follow, namely:

- 39 (1) The Commission shall make, amend or revoke a plan to achieve a balanced, efficient and effective management and use of the spectrum.
- (2) A plan shall -
  - (a) address market expectations and user requirements for allocation, allotment and assignments of the spectrum;
  - (b) promote efficient spectrum use;
  - (c) minimise risks of interference;
  - (d) maximise economic benefit and sustainable competition; and
  - (e) conform, as necessary, to relevant spectrum plans in the region.

In addition, section 3 of the Frequency Management Regulations sets specific guidelines for public interest considerations when establishing spectrum management policies, namely:

In making all decisions regarding spectrum allocation, frequency assignments, and other matters under these Regulations, the Commission shall take into account the following considerations –

- (a) the objects of the Ordinance;
- (b) the likely effects on existing and future availability and uses of spectrum;
- (c) the efficient use of spectrum;
- (d) any regional agreements, standards and arrangements applicable to the allocation and use of spectrum in the Turks and Caicos Islands;
- (e) any applicable international standards, the treaties of the International Telecommunication Union, the Radio Regulations and other agreements; and

- (f) the overriding public interest in efficient utilisation of the spectrum for various public and private telecommunications purposes.

To date, PMT operators in TCI have been licensed to provide mobile wireless services using spectrum in the 850 MHz, 900 MHz and 1900 MHz frequency bands. Within one or more of these bands, LIME has been awarded close to 36 MHz, Digicel 40 MHz and Islandcom 30 MHz of spectrum in total. Consequently, each licensed PMT operator has a relatively similar amount of spectrum in total within these three spectrum bands for the purpose of providing mobile wireless services in TCI.

Recent advances in wireless broadband technology – 4G Long-Term Evolution ("LTE") in particular – provide a means to offer higher data transmission speeds, more consistent quality of service and a far richer experience for end-users, including mobile multimedia applications. However, sufficient spectrum is required to allow operators to expand their wireless network capacity and introduce new broadband wireless technologies to accommodate growth in demand, improve service quality and enhance opportunities for innovation.

As noted in the Initial Consultation Document, 700 MHz spectrum is considered to be particularly attractive for this purpose of deploying broadband wireless technologies such as LTE due to its propagation characteristics which enable radio communication systems operating in this band to cover wide geographical areas and achieve high levels of indoor penetration with relatively fewer base stations. Further, for these same reasons, the cost of network deployment using 700 MHz spectrum can be relatively less than the cost of building a similar network using higher frequencies.

## 2.2 Regional Standards

Global interest in and demand for new spectrum to accommodate emerging mobile technologies such as 4G LTE has grown rapidly in recent years. In response, at the World Radio Conference in 2007, the International Telecommunication Union ("ITU") identified a range of new spectrum bands for such purposes, including the 698-862 MHz spectrum band in the case of ITU Region 2 countries (i.e., the Americas as well as the Caribbean region).<sup>3</sup>

In many countries, portions of this spectrum band have traditionally been used for over-the-air analog television broadcasting. However, with the advances in digital transmission technology, television broadcasting can now be delivered more efficiently, using less and different spectrum. Once this digital switchover ("DSO") is complete, this freed up 700 MHz spectrum band may be repurposed for other uses, such as the provision of broadband mobile telecommunications services. This spectrum is often referred to as the "Digital Dividend". In TCI (as in the United States and other ITU Region 2 countries), the frequency range above 806 MHz is already used for mobile communications. Therefore, the Digital Dividend in TCI's case refers largely to the frequency range 698-806 MHz – i.e., the 700 MHz spectrum band. In the Asia-Pacific region (ITU Region 3) it is a similar frequency range, while in Europe and Africa (ITU Region 1 ) the Digital Dividend is in a different frequency range, namely between 790-862 (i.e., the 800 MHz band).

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<sup>3</sup> See: [http://www.itu.int/newsroom/press\\_releases/2007/36.html](http://www.itu.int/newsroom/press_releases/2007/36.html).

It is worth noting as well that no DSO is applicable for the 700 MHz spectrum band in TCI because no television broadcasters are or have been licensed to operate in that band in TCI. Therefore, there is no need to accommodate the relocation of any such services, which could have otherwise potentially delayed the assignment of 700 MHz spectrum for commercial broadband mobile telecommunications use.

The ITU's 700 MHz spectrum allocations for mobile telecommunications purposes do not carry with them a specific channel plan for the band. Each country is responsible for developing and implementing such plans. Establishing international or regionally harmonized spectrum band plans has many benefits including currently available and lower cost end-user and network equipment (as a result of economies of scale) and the facilitation of international roaming (via the interoperability of end-user equipment). For these reasons, TCI has generally adopted harmonized spectrum allocations on a global and/or regional basis, especially with the United States of America ("USA"). Harmonization with other regional or international frequency arrangements may also be considered, while taking into account specific aspects of the TCI market and services. The Commission intends to follow this same approach in the case of the 700 MHz spectrum band.

### 3 Responses to Initial Consultation Document

This Section provides a review of each of the eleven Consultation Questions posed in the Initial Consultation Document, including a summary of Respondent's responses to each question (where provided) and the Commission's analysis and conclusions in each case. In many cases where consensus exists, Respondents' input has been used as the basis for the Commission's Revised 700 MHz Policy Proposal set out in Section 4 below.

#### 3.1 700 MHz Spectrum Channel Plan

In the Initial Consultation Document, the Commission outlined two alternative 700 MHz spectrum channel plans. The first was based on the Federal Communications Commission ("FCC") 700 MHz spectrum plan adopted in the USA and the second was based on the Eastern Caribbean Telecommunications Authority's ("ECTEL") plan adopted in the ECTEL Member-States. The ECTEL plan retains the traditional 18 x 6 MHz block segmentation throughout the 700 MHz Band, whereas the FCC band plan deviates from traditional 6 MHz block primarily in the Upper 700 MHz spectrum band. A comparison of the two channel plans is provided in Annex 1.

The Commission noted in the Initial Consultation Document that there are advantages and disadvantages with both approaches. At the time, the Commission was of the preliminary view that the ECTEL plan may provide greater flexibility from a regulatory perspective because it does not include large spectrum blocks of up to 22 MHz (as is the case under the FCC plan).

In this respect, Respondents were asked to respond to the following question:

***Consultation Question 1: Do you agree that the 700 MHz spectrum should be channelized in the Turks and Caicos Islands based on 18 channels of 6 MHz each or should we adopt the approach taken by the FCC?***

In its response, LIME indicated that it supports the adoption of the FCC channel plan. It noted that a major advantage of the FCC plan would be the availability of affordable, compatible equipment. LIME claimed that the ECTEL plan, in contrast, could raise equipment costs and delay service launch.

LIME added that for 4G LTE technology deployment purposes, 2 x 6 MHz or 12 MHz spectrum blocks (as contemplated under both plans) are inefficient. It noted that LTE technology uses 2 x 5 MHz or 10 MHz blocks. Consequently, while not recommended, LIME suggested that if the Commission opts for the ECTEL approach, the Commission should consider dividing the 700 MHz spectrum band into 10 MHz rather than 6 MHz spectrum blocks.

In its response, Digicel also indicated that it supports the FCC plan. It also noted that a major advantage in this respect would be the availability of a wide range of suitable network equipment and handsets at reasonable prices.

At the same time, consistent with the FCC plan, Digicel also proposed that 700 MHz spectrum blocks could be grouped in the following manner:

- 1) 698 to 716 MHz and 728 to 746 MHz, 36 MHz in total (Band 12)
- 2) 746 to 756 and 777 to 787 MHz, 20 MHz in total (Band 13)
- 3) 758 to 768 MHz and 788 to 798 MHz, 20 MHz in total (Band 14)

In effect, Digicel's proposal amounts to bundling 700 MHz spectrum blocks as defined under the FCC plan to conform with the 3rd Generation Partnership Project ("3GPP") technical equipment specifications for the 700 MHz band. The first grouping includes Lower A, B and C blocks; the second includes most of the Upper C block; and the third combines the Upper D block with the portion of the public safety use block designated for broadband use under the FCC plan. The proposal is set out in detail in Annex 1 and is contrasted with the existing FCC plan.

Islandcom indicated that it also supports the FCC plan. It added that adopting the FCC approach would ensure (i) terminal interoperability with the US, (ii) compliance with 3GPP 700 MHz frequency allocations and (iii) ready availability of terminals and wireless infrastructure at reasonable prices.

For its part, ECC also expressed its support for the FCC plan. It noted that following the FCC approach will ensure the interoperability and ease of operability when acquiring CPE and other such devices.

In its reply comments, LIME highlighted the fact that all parties who responded to this question supported the FCC channel plan because, in LIME's view, doing so would allow operators to introduce advanced services more quickly and provide customers with the most cost effective services.

### ***Commission Analysis and Conclusions***

As noted, in the Initial Consultation Document the Commission expressed an initial preference for the ECTEL channel plan. However, it is clear that no party who addressed this question supports adoption of the ECTEL plan. All expressed strong support for the FCC plan and, in doing so, highlighted a number of specific benefits associated with the plan, including the availability of relative lower cost, compatible handsets and infrastructure, terminal interoperability with the USA, compliance with international standards and a faster time to market.

Based on its survey of Caribbean jurisdictions (see Annex 2), the Commission notes that some jurisdictions have followed the ECTEL approach, while a roughly similar number have followed the FCC approach. There are still other jurisdictions that are yet to adopt a channelization policy for the 700 MHz spectrum band.<sup>4</sup>

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<sup>4</sup> As noted in Annex 2, some Caribbean jurisdictions (e.g., those within the French West Indies and some of the former Netherlands Antilles) have or are considering following the ITU Region 1 spectrum designations for the purpose of

That said, the Commission found that those Caribbean jurisdictions that have adopted the FCC plan have been the first to licence spectrum in the 700 MHz spectrum band. No jurisdiction adopting the ECTEL plan has done the same as of yet. Consequently, it appears that jurisdictions adopting the FCC plan are far more likely to see the deployment of 4G LTE services in the 700 MHz spectrum band compared to those jurisdictions adopting the ECTEL approach.

It is also worth noting that in 2010, the Asia-Pacific Telecommunity ("APT") Wireless Forum recommended the adoption a channel plan for mobile telecommunications in the 700 MHz frequency band for ITU Region 3 (which includes, among others, Australia, China, India, Japan and South Korea). The APT plan consists of 45 + 45 MHz of contiguous paired spectrum (with a centre gap of 10 MHz). The Commission understands that some South and Central American countries are also considering adopting this plan once they finalize their respective DSOs in the future. However, while the APT plan allows for more efficient use of the 700 MHz band, its adoption in TCI would create interoperability and equipment compatibility issues with the USA. As well, equipment specifications for the APT plan are currently under development, which would delay deployment of LTE-based services in the band – though, given the population size of the Asia-Pacific region, a wide variety of low cost devices for use under the APT plan should eventually become available. While not identified as a possible option in the Initial Consultation Document, the Commission notes that no party raised the APT plan as a potential option for TCI.

On balance, in view of the Respondents' consensus on this question and given the experience in the region to date, the Commission considers that the FCC plan for the 700 MHz spectrum band should be adopted in TCI. This conclusion is reflected in the Revised 700 MHz Policy Proposal.

The Commission notes that Digicel suggested that certain modifications to the FCC plan could also be considered, such as grouping together certain spectrum blocks within the band. The Commission addresses questions relating to potential spectrum block grouping under the FCC plan for spectrum assignment purposes in the Revised 700 MHz Policy Proposal.

### **3.2 Sub-division of 700 MHz Spectrum Blocks**

In the Initial Consultation Document, the Commission proposed that one or more 6 MHz spectrum blocks in the Lower 700 MHz spectrum band be split into 1 MHz, 1.5 MHz and/or 2 MHz sub-blocks so that spectrum licences could potentially be awarded to operators with smaller bandwidth requirements.

In this respect, Respondents were asked:

***Consultation Question 2: Do you agree with the proposal to split one or more of the 6 MHz blocks into smaller sub-blocks to offers licences with smaller bandwidths? If not, please propose another structure for consideration.***

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deploying 4G wireless services (i.e., using the 800 MHz rather than 700 MHz band). These jurisdictions are not relevant to the case at hand.

Under the FCC channel plan, LIME indicated that it does not support splitting any 700 MHz spectrum blocks. However, if the Commission opted for the ECTEL plan, LIME supported subdividing one but no more than two blocks as contemplated by the Commission.

Digicel indicated that it does not support splitting any 700 MHz spectrum blocks. It added that larger blocks are required to provide super high data speeds using LTE.

Similarly, Islandcom indicated that it also does not support splitting any 700 MHz spectrum blocks. It added that larger blocks allow more efficient use of the spectrum. It also claimed that in its view there is no business case for narrow band channels of 1, 1.5 or 2 MHz of 700 MHz spectrum. In any case, Islandcom suggested that 700 MHz spectrum blocks could be sub-divided at a later point in time if necessary.

On the other hand, ECC indicated that it supports splitting one or more blocks to ensure that the spectrum is properly utilized and available to small businesses within TCI.

### ***Commission Analysis and Conclusions***

The Commission notes that, other than the ECC, there is no support among the Applicants for splitting blocks of 700 MHz spectrum within the FCC plan. Nor did any party identify specific a need for splitting blocks at this time. In addition, the Commission notes that based on its survey of neighbouring Caribbean jurisdictions, there appears to be no evidence of splitting spectrum blocks under either the FCC or ECTEL plans.

Consequently, the Commission considers that there is no identified need at this time to sub-divide blocks as initially contemplated by the Commission. This conclusion is reflected in the Revised 700 MHz Policy Proposal.

## **3.3 Technology Neutral Usage of 700 MHz Spectrum**

In the Initial Consultation Document, the Commission proposed that the 700 MHz spectrum band should be used for the provision broadband wireless services, with a portion of the frequency band being designated for public health and safety purposes. The Commission also proposed that licensed PMT operators should be free to deliver such service with any technology of their choosing.

In this respect, Respondents were asked:

***Question 3: Do you agree with the proposal that the service provider can use any technology of its choosing within the band? If not, why?***

LIME, Digicel and Islandcom all agreed that 700 MHz spectrum licensing should be done on a technology neutral basis. Digicel qualified its position in this regard by adding the stipulation that different wireless systems must interoperate without causing interference. Similarly, Islandcom added that any technology used in the band should not interfere with other adjacent and in-band PMT operators.

### *Commission Analysis and Conclusions*

On this question, there is consensus. The Commission agrees with the parties that in licensing 700 MHz spectrum in TCI there should generally be no restrictions on technology use, as long as the technology deployed in the band does not cause interference with other adjacent and in-band uses. The Commission also considers this approach to be consistent with the sub-sections 39 (2)(b) and (c) of the Ordinance which requires that spectrum management plans implemented by the Commission promote efficient spectrum use and minimize risks of interference.

That said, the Commission notes that LIME, Digicel and Islandcom focussed much of their overall responses to the Initial Consultation Document on the requirements for and benefits of deploying 4G LTE technology in the 700 MHz spectrum band. The Commission considers that while there may be other technologies or applications that could be deployed in the band, the primary objective of opening up the 700 MHz spectrum band for licensing is to promote the deployment of 4G LTE-based services for the benefit of consumers and businesses in TCI.

## **3.4 Spectrum Demand**

In the Initial Consultation Document, the Commission asked the Applicants and other entities interested in acquiring commercial mobile spectrum to provide specific spectrum usage information through the following question:

***Question 4: Indicate your need for additional spectrum for commercial mobile service applications and how much spectrum is required.***

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

***(b) What types of applications/uses are envisioned?***

***(c) To what degree will your business anticipated spectrum needs be addressed by having access to the 700 MHz spectrum?***

In its response, LIME claimed that it requires 4 x 10 MHz or 40 MHz of 700 MHz spectrum to provide what it referred to as "suitable" service offerings to its customers. LIME indicated that it plans to offer Wireless Broadband Access services with 700 MHz spectrum as well as Mobile TV (although in the latter case it also indicated that it would prefer to use other UHF spectrum rather than 700 MHz for this purpose). LIME indicated that its deployment timeline for these services "is a matter of immediacy pending availability of equipment."

Digicel indicated that deployment services using 700 MHz spectrum could have started by this year (i.e., within a one-year time frame) if the FCC channel plan were adopted used, since end user devices would be in production in mass market volumes and at mass market prices. Digicel indicated that a large range of potential applications could be delivered using 700 MHz spectrum, including mobile broadband for laptops, tablets and smartphones. It added that it is currently upgrading all of its networks in the region and is planning to install 4G LTE as soon as the technology is ready for wide scale deployment. Digicel added that obtaining spectrum in the 700MHz band is a crucial part of this strategy.

For its part, Islandcom stated at the time that deployment timelines for services using 700 MHz spectrum were not available, but it also indicated that such services are planned for the "near future". Islandcom also indicated that it requires 700 MHz spectrum to deploy 4G LTE technology to support the massive growth in data usage (made up largely of video) expected over next five years.

Andrews indicated that it has immediate need for 700 MHz spectrum to deploy planned Internet services. Andrews also claimed that it has already purchased the necessary equipment which operates in the 700 MHz frequency band (i.e., specifically, the 743 MHz frequency).

In its reply comments, LIME suggested that all of the responses indicated a level of immediacy for 700 MHz spectrum and underscored the urgency with which the Commission has to act to make 700 MHz spectrum available.

### ***Commission Analysis and Conclusions***

In response to this question, all Respondents indicated a desire to acquire 700 MHz spectrum.

As to deployment timelines, all suggested that the service launch using 700 MHz spectrum would likely take place very rapidly or, as Islandcom noted, in the near future.

As to the types of services envisioned, parties indicated that a range of 4G LTE-based broadband wireless services could be provided using the 700 MHz spectrum, although few specifics were provided.

On the other hand, no details were provided as to how each of the Applicant's additional spectrum requirements would be addressed by acquiring 700 MHz spectrum band relative to their current spectrum holdings in the 850 MHz, 900 MHz and/or 1900 MHz bands. Nor did any party comment on whether broadband wireless services could be effectively and efficiently deployed in TCI using their current spectrum holdings with or without the use any other unused spectrum in other frequency bands.

Consequently, other than the fact that all parties who filed comments expressed strong interest in being granted 700 MHz spectrum, no evidence was provided suggesting that any one Applicant is in any greater need of 700 MHz spectrum than another.

## **3.5 "Optimum" Quantity of 700 MHz Spectrum**

In the Initial Consultation Document, the Commission noted that PMT operators have in the past made requests and inquiries for the Commission to award them the entire capacity of an unopened spectrum band. In the case of 700 MHz spectrum, the Commission proposed not to award an entire spectrum band to a single operator; but rather to award what it referred to as an "optimum" amount of spectrum to each licensee.

In this respect, interested parties were asked the following.

***Question 5: Do you agree with the Commission's proposal that licensees should only be awarded an optimum amount of spectrum licences for services to be provided in a territory? If you disagree, please provide a framework for the Commission to consider when determining the amount of spectrum bandwidth to award each potential licensee.***

In its response, LIME stated that it was not sure it understood the question, but assumed that it related to the "optimum" amount of spectrum considered necessary to provide 4G LTE-based services using 700 MHz spectrum. For this purpose, LIME suggested that in the order of 4 X 10 MHz or 40 MHz of spectrum should be considered "optimum".

Digicel, in its response, also indicated that it was also unsure how the term "optimum" was meant to be defined. It suggested that it would not be "optimum" to split up the 700 MHz spectrum in to small blocks as that would defeat the major advantage of 4G LTE technology in terms of enabling super high speed data transmission rates.

Digicel suggested that operators could be asked to show that they are going to use bandwidth within a particular timeframe and not merely sit on it. It added that operators should also have a track record of rolling out data networks elsewhere, and not just be a speculator. Digicel also suggested that 700 MHz spectrum should ideally be split up in to two main blocks (of 20 to 36 MHz) as indicated in its response to Initial Consultation Question 1 above, since that would in its view enable the maximum data speeds. Digicel suggested that the possibility exists to use the remaining spectrum reserved for public safety under the FCC approach for a third operator if desired.

Islandcom stated that it did not understand question and, therefore, provided no response.

### ***Commission Analysis and Conclusions***

Both LIME and Digicel suggest that very large blocks of as much as 40 MHz of spectrum are required to deliver super high speed 4G LTE services. Their comments imply that up to 40 MHz should be considered the "optimum" amount of 700 MHz spectrum to be awarded to an operator. Islandcom and Andrews provided no input on this question.

The Commission acknowledges that it did not define the term "optimum" in the Initial Consultation Document. That said, the interpretation adopted by both LIME and Digicel is based largely on current LTE technology specifications with little regard to how the available 700 MHz spectrum under the FCC plan could be divided among licensed operators in an optimum manner. In the Commission's view, a reasonable balance between these considerations must be found given the relatively limited amount of 700 MHz spectrum available for commercial use under the FCC plan. The Commission addresses this matter further below.

## **3.6 "Sufficient" Quantity of 700 MHz Spectrum**

In the Initial Consultation Document, the Commission noted that the estimated demand for 700 MHz spectrum, based on the Applications, exceeds the amount of available spectrum especially when one also considers reserving for future expansion and catering for public health and safety services. The Commission also expected that demand for 700 MHz spectrum would continue to

increase. As a result, the Commission proposed that 12 MHz of 700 MHz spectrum per operator would be sufficient and asked parties to comment on this proposal.

***Question 6: Do you consider 12MHz of spectrum per operator to be sufficient considering the Commission's conditions of bandwidth requirements and customer base? If not, what bandwidth would you recommend and for what reasons?***

The Applicants all disagreed with this proposal.

LIME claimed that 2 x 10 MHz or 20 MHz of 700 MHz spectrum is a "base requirement" for successful deployment of services in the 700 MHz spectrum band, otherwise it asserted that service quality would be poor.

Digicel, in its response, claimed that with an allocation of only 12 MHz of 700 MHz spectrum, the possible data transmission speeds would be limited to only about 25% of the capabilities of LTE technology. It added that for LTE to be a game changer in terms of the impact on people's lives and the services they can obtain, Digicel suggested that ideally 36 MHz or preferably 40MHz per operator would be necessary.

In its response, Islandcom indicated that while 12 MHz is necessary, it is not sufficient. It claimed that 12 MHz of 700 MHz spectrum is the "minimum" amount the Applicants would need to be able to overlay their existing networks with a technology like LTE. It noted that LTE is a broadband technology requiring a minimum of 2 x 5 MHz of spectrum to operate and that the larger the block of spectrum, the more efficient LTE can be.

In its reply comments, LIME claimed that, based on its parties comments, that it is clear that 12 MHz should not be considered sufficient 700 MHz spectrum for any operator.

### ***Commission Analysis and Conclusions***

The Commission notes that the Applicants generally agreed that 12 MHz of 700 MHz spectrum is the "minimum" requirement for the deployment of 4G LTE services. However, the Applicants all agree that operators require more than 12 MHz of spectrum to deliver the full capabilities and benefits of 4G LTE technology.

At the same time, no Respondent indicated precisely what it considered to be a "sufficient" as opposed to "optimum" amount of 700 MHz spectrum. In this respect, however, the Commission notes that in their respective 700 MHz spectrum licence applications, LIME requested 22 MHz of spectrum, Islandcom requested up to 24 MHz of spectrum and Digicel requested 36 MHz. Taking the three applications into account, it could be implied that a spectrum block including 2 x 10 MHz or 20 MHz of 700 MHz spectrum block could be considered "sufficient", if not "ideal". The Commission addresses this matter further below.

## **3.7 Spectrum for Public Safety Use**

In the Initial Consultation Document, the Commission noted that it has reserved spectrum for public safety and government use in the frequency bands 163-173 MHz, 453-458 MHz, 3480-

3500 MHz and 3580-3600 MHz, and that additional bands may be included on an as needed basis for this same purpose. With this in mind, the Commission asked interested parties and specifically public safety and commercial stakeholders to provide responses to the following questions:

***Question 7: Do public safety agencies need spectrum for broadband applications? If so:***

***(a) How much and for which type of applications?***

***(b) What are the anticipated deployment plans and the possible constraints, if any, in implementing these plans?***

***(c) Is there suitable alternate spectrum to the 700 MHz to meet these broadband requirements?***

In its response, LIME suggested that reserving 2 channels (12 MHz) of 700 MHz spectrum would be adequate for public safety purposes.

Digicel indicated that it considers that the public safety authorities are likely to use the network of one of the operator's networks in TCI rather than build a separate public safety system of their own. In such case, Digicel considers that there would be no need for a separate allocation of spectrum in this respect. At the same, in response to Initial Consultation Question 11, Digicel suggested that some spectrum could be set aside for public safety purposes as contemplated under the FCC channel plan (which it supports).

For its part, Islandcom indicated that it agrees with the need for and importance of a robust public safety network, but it does not believe the use of 700 MHz spectrum is necessary for this purpose.

For its part, the ECC stated that public safety agencies do in fact need 700 MHz spectrum for broadband applications and that the spectrum set aside under the FCC band plan should suffice in this respect.

With respect to the sub-parts of this question, ECC indicated that it is difficult to say exactly how much 700 MHz spectrum is required for public safety purposes, since it would depend on the applications deployed. ECC provided a number of possible public safety related applications in this respect, including mobile data and video to public safety vehicle applications. ECC added that the deployment plans would depend heavily on the Government's ability to fund the necessary equipment for the ECC and the participation of telecom providers in serving the public safety agencies. As well, ECC claimed that while one can pose an argument that an alternate spectrum band could be used for public safety purposes, in its view the fact of the matter is that equipment designed for 700 MHz spectrum may only work in 700 MHz frequency band. Lastly, the ECC noted that its objective is to provide lifesaving communications in TCI to ensure public safety, hence it requires the best available technology to successfully achieve this goal.

### ***Commission Analysis and Conclusions***

Under the FCC channel plan, 2 x 12 MHz or 24 MHz of spectrum in total in the Upper 700 MHz spectrum band is reserved for public safety use (i.e., 763-775 MHz paired with 793-805 MHz – see Annex 1). In addition, it is the Commission's understanding that the Upper D block (i.e., 5 + 5 MHz or 10 MHz in total, 758-763 MHz paired with 788-793 MHz) has also been recently designated as reserved spectrum for public safety purposes under the FCC plan.<sup>5</sup> Consequently, in total, 34 MHz of spectrum has been reserved for public safety purposes under the FCC plan.

Both LIME and Digicel expressed some degree of support for reserving 700 MHz spectrum for public safety purposes and, to the extent any 700 MHz spectrum were reserved, they appear to support a more limited set-aside than contemplated under the FCC plan. Islandcom, on the other hand, claimed that no set-aside of 700 MHz spectrum for public safety purposes is necessary.

Consequently, the Applicants are of mixed opinion as to whether and, if any, how much 700 MHz spectrum should be reserved for public safety use.

The Commission also notes that none of the Applicants addressed the desirability of obtaining spectrum for commercial use in spectrum blocks reserved for public safety use under the FCC plan (including the Upper D block). The Commission suspects that few, if any, commercial LTE-enabled terminal devices would be available for use in these spectrum blocks at least for the immediate future, thereby delaying any potential commercial deployment of LTE-based services in these spectrum blocks indefinitely.

The Commission also considers that ECC makes a reasonable case for reserving 700 MHz spectrum as contemplated under the FCC plan, since new broadband public safety services are expected to be developed using the designated spectrum blocks in the future. At the same, however, ECC acknowledges that public safety authorities may not be in a position to build out their own networks in TCI and that they would more likely need to rely on existing telecom operators to deliver broadband public safety services (as also noted by Digicel).

As to other Caribbean jurisdictions, it appears that in most cases the general practice has been to set aside some Upper 700 MHz spectrum for public safety purposes, although there is some variation in the size and location of the set-aside due to differences in the adopted channel plan (e.g., FCC vs ECTEL).

Having considered parties' comments and the general practice in the region, the Commission is of the view that 700 MHz spectrum reserved for public safety use under the FCC channel plan should be reserved on an equivalent basis in TCI at this time. This conclusion is reflected in the Revised 700 MHz Policy Proposal. As described below, the Commission would nevertheless remain open to any proposals by parties wishing to make use of the spectrum for commercial purposes, while also assisting public safety agencies deliver broadband public safety services in TCI.

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<sup>5</sup> Bill H.R. 3630 — Middle Class Tax Relief and Job Creation Act of 2012. For further details, see <http://www.gpo.gov/fdsys/pkg/BILLS-112hr3630enr/pdf/BILLS-112hr3630enr.pdf>.

### 3.8 Traditional Spectrum Assignment Approaches

In the Initial Consultation Document, the Commission noted that traditionally spectrum has been assigned on a first-come first-served ("FCFS") basis in TCI. Parties were asked to comment on the use of FCFS versus comparative selection approaches for assigning 700 MHz spectrum.

***Question 8: Do you agree that the traditional first-come, first-served method of assigning spectrum in the Turks and Caicos Islands is appropriate in the case of the 700 MHz spectrum, or would it be preferable to use a comparative selection method?***

In its response, LIME indicated that for the case at hand a comparative selection or "beauty contest" approach has merit, but the rules for such a process must be clear and distributed ahead of time. LIME suggested that each operator who applies for 700 MHz spectrum should be allocated a minimum amount and a beauty contest approach could be used to determine which operator(s) is assigned additional spectrum. LIME also added that the Applicants should be given preference over unlicensed or new operators.

Digicel indicated that it does not support a FCFS approach. It suggested that a FCFS approach can encourage operators to apply speculatively for spectrum far in advance of it being required, irrespective of the merits of their network and service plan. Therefore, in Digicel's opinion a fairer approach would be to use a comparative selection or "beauty contest" approach.

Islandcom claimed that TCI is not best served by using a FCFS method of assigning spectrum. It proposed that the existing three PMT operators in TCI should all be treated fairly, and the 700 MHz spectrum should be made available to all three Applicants.

Andrews, for its part, suggested that the Commission should be wary of established PMT operators requesting 700 MHz spectrum with no demonstrated immediate need for that spectrum. It added that if they are allowed to acquire or purchase spectrum prematurely, the Government's ability to effectively direct the growth and direction of the industry would be lost.

#### ***Commission Analysis and Conclusions***

None of the Respondents' supported the use of a FCFS approach for assigning 700 MHz spectrum. Indeed, in view of the Applications (which involve competing requests for the same spectrum blocks), a FCFS approach to assigning 700 MHz spectrum would not be feasible in any event.

Consequently, an alternative approach is required for the case at hand. The Commission notes that there appears to be support among the parties for the adoption of a comparative selection process as long as the criteria for the process are clear and provided to interested parties well in advance. The Commission is also of the view that a comparative selection process is the best approach for the case at hand. This conclusion is reflected in the Revised 700 MHz Policy Proposal.

### 3.9 Use of an Auction to Award 700 MHz Spectrum

As outlined in the Initial Consultation Document, given the particular characteristics of the 700 MHz spectrum, the Commission considered that it may be appropriate to use another spectrum assignment methodology in this case. Two alternative approaches were noted by the Commission in this respect: auctions and administrative pricing.

The Commission noted that auctions come in many forms and that an auction is generally considered to be the best approach for determining the true market value of a resource. Four auction formats were noted in the Initial Consultation Document:

- (1) English auction or open ascending price auction,
- (2) Dutch auction or open descending price auction,
- (3) Sealed first price auction, and
- (4) Vickrey auction.

Parties were asked the following question regarding the possible use of an auction process to assign 700 MHz spectrum:

***Question 9: Would you consider auction as an appropriate method for awarding Licences/frequencies in the 700 MHz band? What type of auction would you consider best if auctions were to be used?***

LIME stated that it does not favour an auction approach. It suggested that auctions can inflate the price of spectrum which then translates into higher costs for consumers and limits capital otherwise available for network deployment purposes.

LIME also suggested that a first round assignment process using administrative pricing to assign a basic amount of spectrum could be adopted together with a second round process using an auction approach for operators requiring more spectrum.

In its response, Digicel indicated that it does not in general support the use of an auction. It claimed that while such an approach may raise money for the government, it tends to weaken investors at the expense of consumers and the economy. Digicel suggested that spectrum licence fee should be kept low, and an administrative pricing approach or beauty contest spectrum assignment approach should be adopted.

Digicel added, however, that should an auction process be adopted, it supports an English Auction format structured in a way to minimize rather than maximize prices paid. Digicel added that an auction approach would require a prequalifying stage.

Islandcom indicated that it agrees that properly a constructed auction would provide an efficient way to award licenses in a non-discriminatory and fair manner. However, in the absence of any new PMT operators in TCI, Islandcom proposed that a certain amount of the 700 MHz spectrum

be awarded to each Applicant to recognize, at least in part, the investments already made in TCI to date.

Andrews, for its part, indicated that the Commission should bear in mind that a spectrum auction could give an unfair advantage to the largest of the bidders to the detriment of small providers.

In its reply comments, LIME claimed that no party to the consultation supports use of an auction as a primary method for allocating 700 MHz spectrum in TCI.

### ***Commission Analysis and Conclusions***

The Commission notes that none of the Respondents supported the use of an auction process for the purpose of awarding 700 MHz spectrum. The main concern in this respect appears to be the potential for price of spectrum to escalate under such an approach. As well, as mentioned by Andrews, there is also the risk that smaller players may be disadvantaged under such an approach, absent any measures (such as the use of spectrum caps) to ensure a reasonable opportunity for such players to obtain spectrum.

Spectrum auctions are currently the norm in large countries such as the USA, Canada as well as in European countries, in cases where demand exceeds supply of spectrum. However, spectrum auctions are far less common in Caribbean jurisdictions. Aruba, for one, has used an auction process to assign spectrum in the 900 MHz and 1800 MHz spectrum bands. Trinidad and Tobago has also used an auction process to assign spectrum in the 850 MHz and 1900 MHz spectrum bands as well as the Lower 700 MHz spectrum band. In addition, 700 MHz spectrum was auctioned in Puerto Rico and the US Virgin Islands, given they are subject to FCC regulation. Otherwise, the Commission is not aware of any other Caribbean jurisdictions that have relied on auctions to award spectrum, especially jurisdictions of comparable scale to TCI.

While the Commission remains of the view that an auction process is the best means to establish the market value of spectrum, it also considers that an auction process could introduce an unnecessary degree of complexity and cost to the process of assigning 700 MHz spectrum in TCI and would therefore be disproportionate in the case at hand. Therefore, at this time, the Commission does not consider the use of an auction process to be necessary or appropriate for the purpose of assigning 700 MHz spectrum.

### **3.10 Administrative Pricing Approach**

As noted above, an auction mechanism simultaneously assigns and determines the pricing of the spectrum. In the absence of the use of a spectrum auction, a mechanism must be determined to establish the price of spectrum. In the Initial Consultation Document, the Commission noted that administrative pricing of spectrum seeks to recover the cost of spectrum regulation from the regulated entities. However, were such an approach adopted for the 700 MHz spectrum band, however, there would be a potential requirement to set 700 MHz spectrum fees as part of an revision of all spectrum fees so that all spectrum fees would be set on an equivalent basis. Absent such a review, the Commission proposed that the price of 700 MHz spectrum should be

set above the current price of 850 MHz spectrum in TCI (i.e., above a rate of \$30,000/10MHz paired).

In this respect, interested parties were asked to comment on the use of an administrative pricing mechanism as a means to price and award spectrum:

***Question 10: Would you consider administrative pricing as an appropriate method for awarding Licences/frequencies in the 700 MHz Band? What costs would you include for consideration in determining the regulatory costs?***

In response, LIME stated that the 700 MHz spectrum price should be set to recover the Commission's administrative costs and no more. At the same time, referencing its response to the preceding question, LIME also indicated that the cost of 700 MHz spectrum should not exceed the cost of equivalent spectrum in the 850 MHz and 1900 MHz frequency bands in TCI. More generally, LIME claimed that over-pricing spectrum would only serve to delay the introduction of new and innovative services.

Digicel claimed that it is important to recognize that LTE would be incremental to but not a replacement to 2G and 3G technologies already in place in TCI. Digicel added that it considers that a much better approach (for all parties and not just the PMT operators) would be to recognize that total costs of spectrum should not be excessive and that it will take many years to move completely off spectrum currently used for GSM-based services.

As to price level, Digicel claimed that the current 850 MHz spectrum rate in TCI is, according to Digicel's calculations, approximately 30 times the cost in Trinidad and Tobago (when compared on a cost per MHz per capita basis). That said, Digicel proposed that the 700 MHz spectrum fee be based on the existing 2G (i.e., 850 MHz) spectrum fee, but gradually phased in over 10 years. Under Digicel's proposal, the 700 MHz spectrum fee would be set at 5% of the 2G spectrum fee in year 1 and increase by 5% each year over the course of 10 years (i.e., to 50% in year 10). The fee would then be set equal to the 2G fee from year 11 and beyond.

In its response, Islandcom suggested that the Commission should price 700 MHz spectrum in such a way as to encourage investment and innovation. Islandcom noted that due to the relatively small size of the population in TCI, a provider's recovery time for its investment tends to be prolonged. Consequently, according to Islandcom, spectrum and administrative fees should be set at a reasonable level, and in no event above the current fees associated with the 850 MHz spectrum.

In its reply comments, LIME noted that no party supported pricing 700 MHz spectrum above the current 850 MHz spectrum licence fee.

### ***Commission Analysis and Conclusions***

The Commission notes that rather than comment on the use of an administrative pricing approach or other spectrum pricing approach for awarding 700 MHz spectrum, parties focussed on the level of the price of 700 MHz spectrum.

As summarized by LIME, no party supported pricing spectrum above the current fee for 850 MHz spectrum. Under Digicel's proposal, the proposed fee for 700 MHz spectrum would in fact be well below the current 850 MHz spectrum fee – i.e., effectively 75% lower on average for the initial 10 year license term.

Absent a comprehensive review of existing spectrum fees, the Commission is of the view that the licence fee for 700 MHz spectrum should be set in relation to existing fees for other licensed spectrum in use in TCI. The Commission considers that it would also be useful to take into account spectrum licence fees in other Caribbean jurisdictions as a further test of reasonableness. Taking these two factors into account, the Commission's proposed 700 MHz spectrum licence fees are set out in the Revised 700 MHz Policy Proposal.

### **3.11 Reservation of 700 MHz Spectrum for Future Use**

In the Initial Consultation Document, the Commission indicated that it proposed to reserve some additional spectrum in the 700MHz band to accommodate future technology development. Specifically, it asked interested parties to respond to the following question:

***Question 11: Do you consider that it is appropriate to reserve any channels of the 700 MHz band for future use?***

In its response, LIME suggested that, if possible, some channels should be reserved for future use, but not at the expense of legitimate requests by operators who have a present use for the spectrum. Digicel appeared to suggest that the spectrum designated for public safety purposes under the FCC plan could be reserved. On the other hand, Islandcom indicated that in the absence of any clear government policy decisions on the 700 MHz spectrum band, it does not see the need to reserve any of the 700 MHz band for future use.

#### ***Commission Analysis and Conclusions***

Based on parties' comments on this question, it appears that there is little support for setting aside spectrum for future use other than spectrum designated for public safety uses.

Experience from other Caribbean jurisdictions suggests that there is no general policy of reserving designated 700 MHz spectrum blocks for future use. That said, however, there are relatively few Caribbean jurisdictions who have awarded 700 MHz spectrum to date. Consequently, there is no established approach in this respect in the region.

As the Commission has already indicated, it considers that spectrum in the Upper 700 MHz spectrum band designated for public safety use under the FCC plan should be reserved for future use. The same could apply to the Upper D block, which now is also designated for public safety use under the FCC plan. The Commission would also add that there appears to be no clear current use for the four 1 MHz guardbands in the Upper 700 MHz spectrum band under the FCC plan. Therefore, the Commission also proposes to reserve these spectrum blocks for future use, pending some identified use for them that would not cause interference in adjacent spectrum blocks. This conclusion is reflected in the Revised 700 MHz Policy Proposal.

### 3.12 Other Matters

Lastly, some Respondents also raised additional matters outside of those raised in the Commission's Initial Consultation Questions.

Islandcom, for instance, emphasized that any measures taken by the Commission with respect to the 700 MHz spectrum assignments should bear in mind the policy objective promoting sustainable competition in the telecommunications sector in TCI.

Similarly, Andrews argued that it is imperative that the Commission consider, in determining 700 MHz spectrum policy, the particular circumstances of the local market and the function of the Commission to facilitate, maintain and promote effective and sustainable competition in the telecommunications sector in TCI.

In response, the Commission acknowledges the concerns raised by Islandcom and Andrews in this respect. As described above, the Commission notes that when developing spectrum management policies, it is required under Section 39(2)(d) to maximize economic benefit and sustainable competition. Moreover, under Section 3(a) of the Frequency Management Regulations, in making decisions regarding spectrum assignments, the Commission also required to take into account the objectives of the Ordinance, which specifically include under section 4(d) the requirement to "facilitate, maintain and promote effective and sustainable competition in telecommunications."

The Commission's Revised 700 MHz Policy Proposal addresses these objectives along with the other objectives set out in Section 2 above.

In its comments, Andrews also suggested that, in its view, a meeting with industry members and the Commission should be conducted to discuss the concerns raised by the questions posed and other concerns that may impact or be impacted by the issuing of 700 MHz spectrum.

In response, the Commission considers that this present second consultation provides a more effective means to develop a policy framework for 700 MHz spectrum use in TCI. The Commission, nevertheless, has not ruled out a meeting with industry members should it prove necessary once it completes its review of interested parties' responses to this Second Consultation Document.

Lastly, the Commission notes that in its Response (page 1), Andrews stated that "in 1997 it was granted by the Executive Council approval in relation to the use of spectrum that was far ranging." Andrews also indicated that it had recently purchased equipment necessary to roll out Internet services using the 743 MHz frequency.

In its reply comments, LIME expressed concern with Andrews' claim that it was granted approval to use spectrum by Executive Council in 1997. LIME stated that, according to section 34 of the Ordinance, it is the Commission who has the authority to issue spectrum licences. Moreover, it added that Andrews' licence, as posted on the Commission's website, does not reference spectrum in the 700 MHz band. LIME noted in its reply comments that it trusted that the Commission will address this matter.

In response, the Commission confirms that Andrews does not currently hold a spectrum licence in TCI in any frequency band, including the 700 MHz band. Moreover, to date, the Commission has not received a spectrum licence application from Andrews.

## 4 Revised 700 MHz Policy Proposal

In this section the Commission sets out its Revised 700 MHz Policy Proposal for TCI, which is based on Respondents' comments on the Initial Consultation Document as well as the Commission's survey of 700 MHz spectrum policies in Caribbean and other international jurisdictions. The Commission is seeking interested parties' input on the Revised 700 MHz Policy Proposal as well as responses to the specific Consultation Questions set out below.

The main elements of the Revised 700 MHz Policy Proposal include the following:

- i) channel plan and related details,
- ii) spectrum assignment policy,
- iii) spectrum assignment methodology,
- iv) spectrum licence fees,
- v) licensing conditions, and
- vi) implementation process.

### 4.1 Proposed Channel Plan Details

As discussed above, all parties who commented on the preferred channel plan for the 700 MHz frequency band supported adoption of the FCC plan. The Commission is in agreement with the parties in this respect and, consequently, proposes that the FCC channel plan for the 700 MHz spectrum band be adopted in TCI.

Further, the Commission also agreed with the majority of the parties that it is not necessary or appropriate at this time to split or sub-divide any of the 700 MHz spectrum blocks under the FCC channel plan into sub-blocks of 1 MHz, 1.5 MHz or 2 MHz.

In addition, the majority of the parties agreed that some 700 MHz spectrum should be reserved for public safety use in TCI, as is the case under the FCC plan. In the Commission's view, given that it is unlikely that any such spectrum would be used for public safety purposes in the near term in TCI, this spectrum should therefore effectively be reserved for future use. However, as the Commission noted above, if a commercial use is identified for this spectrum, which could also accommodate public safety agency requirements in TCI, it could potentially be licensed to an operator for both purposes.

Accordingly, the Commission proposes to reserve the following 700 MHz spectrum blocks for future public safety use and/or possible joint public safety and commercial use.

- **Reserved Public Safety Use Spectrum:** 763-775 MHz paired with 793-805 MHz (24 MHz in total)

As noted above, the Commission understands that the Upper D block in the 700 MHz spectrum band has now also been designated for public safety use under the FCC channel plan. In view of this development, the Commission proposes to also reserve the Upper D block for future use given the uncertainties associated with possible current uses of this spectrum. However, here again, if a commercial use is identified for this spectrum, it could potentially be licensed to an operator for commercial use.

Accordingly, the Commission proposes to reserve the following 700 MHz spectrum blocks for future public safety and/or commercial use.

- **Reserved Upper D Block:** 758-763 MHz paired with 788-793 MHz (10 MHz in total)

Lastly, the Commission considers that the four 1 MHz guardbands included in the FCC channel plan should also be reserved for future use. If a commercial use is identified for one or more of these 1 MHz blocks, that does not create interference concerns, they could be potentially licensed to an operator.

Accordingly, the Commission proposes to reserve the following 700 MHz spectrum guardband blocks for future use.

- **Reserved Guardband Blocks:** 757 MHz, 775 MHz, 787 MHz, 805 MHz (4 MHz in total)

Table 3 below shows the 700 MHz spectrum blocks (i.e., 70 MHz in total) available for immediate licensing for commercial licensing purposes:

<b>Table 3: Proposed 700 MHz Spectrum Available for Commercial Use</b>			
<b>Block</b>	<b>Pairing</b>	<b>Frequency</b>	<b>Total MHz</b>
Lower A	Paired	698-704 MHz/728-734 MHz	6 + 6 = 12 MHz
Lower B	Paired	704-710 MHz/734-740 MHz	6 + 6 = 12 MHz
Lower C	Paired	710-716 MHz/740-746 MHz	6 + 6 = 12 MHz
Lower D	Unpaired	716-722 MHz	6 MHz
Lower E	Unpaired	722-728 MHz	6 MHz
Upper C	Paired	746-757 MHz/777-788 MHz	11 + 11 = 22 MHz
<b>Total</b>			<b>70 MHz</b>

The Commission understands that some of the above-listed 700 MHz spectrum blocks may be considered more desirable than others, largely due to the fact that LTE-based terminal devices and network equipment are currently available at affordable prices in some blocks, but not others. These include the Lower B and C blocks, which are currently being used to provide LTE-based services in the USA by AT&T, and the Upper C block, which is currently in use by Verizon in the USA for the same purpose. Further, as set out in Table 1 above, the Applications are generally reflective of these relatively more desirable blocks, including Lower B and C and Upper C.

However, at this time, the ability to deploy LTE-based services in the Lower A block may be somewhat more limited, given that there is apparently no significant LTE deployment in this spectrum block in the USA at this time. For the same reason, it is not clear to what degree the two unpaired spectrum blocks, Lower D and E, could be readily used to deploy LTE-based services in the near term.

Consequently, for the immediate term, the Commission considers that the Lower B and C and Upper C spectrum blocks to be the relatively more desirable or "prime" 700 MHz spectrum blocks available for commercial use in TCI at this time. The Applications generally requested these "prime" blocks.

With respect to the Commission's above-noted proposals for the 700 MHz channel plan in TCI, parties are invited to respond to the following questions:

**Question 1: FCC Channel Plan:** Do you agree with the Commission's proposal to adopt the FCC 700 MHz spectrum channel plan for TCI? If not, explain why not and provide a specific alternative proposal with supporting rationale.

**Question 2: Public Safety Spectrum Reserve:** Do you agree with the Commission's proposal to reserve for future use the 700 MHz spectrum designated for public safety use under the FCC channel plan (i.e., 763-775 MHz paired with 793-805 MHz)? If not, explain whether there are any immediate or near term commercial uses for this spectrum, in whole or part, that could also support future public safety requirements.

**Question 3: Upper D Block Reserve:** Do you agree with the Commission's proposal to reserve the Upper D block designated for public safety use under the FCC channel plan for future public safety and/or commercial use? If not, explain whether there are any immediate or near term commercial uses for the Upper D block.

**Question 4: Band 14:** Digicel proposed that Band 14 (i.e., as illustrated in Annex 1, 758-768 MHz paired with 788-798 MHz, 20 MHz in total) could be licensed for commercial uses. This band includes the Upper D block and part of the public safety spectrum reserve. Comment on whether there are any immediate or near term commercial uses for this specific spectrum band.

**Question 5: Lower A Block:** Comment on whether there are any immediate or near term practical and economic options for deploying LTE-based services in TCI in the Lower A block in comparison to the Lower B, C and/or Upper C blocks.

**Question 6: Unpaired Lower D and E Blocks:** Comment on whether there are any immediate or near term commercial uses in TCI for the unpaired Lower D and E blocks, and also comment on their relative attractiveness compared to the Lower B, C and/or Upper C blocks.

**Question 7: "Prime" Spectrum Blocks:** Comment on whether you agree that the Lower B, Lower C and Upper C to be the relatively more desirable or "prime" 700 MHz spectrum blocks available for commercial use in TCI at this time.

## 4.2 Proposed 700 MHz Spectrum Assignment Policy

As set out in Table 1, the three Applications involve overlapping requests for the same blocks of 700 MHz spectrum. Moreover, in their responses to the Initial Consultation Document, the three Applicants suggested that a substantial amount of 700 MHz spectrum (up to 40 MHz) is required to deliver the full potential of LTE. Andrews also expressed interest in obtaining 700 MHz spectrum for the purpose of providing Internet services.

The Commission notes that the amount of 700 MHz spectrum available for the immediate deployment of commercial 4G LTE-based broadband services is relatively limited. It is possible that additional 700 MHz spectrum could be used for commercial purposes in the future – i.e., in the Upper D block and/or some part of the spectrum band currently designated for public safety use under the FCC plan. However, it is not possible to grant each licensed operator with what they respectively consider to be an "optimum" amount of 700 MHz spectrum.

While there may be a limited amount of 700 MHz spectrum available for deploying commercial 4G LTE services, the Commission notes that there are other options for deploying such services, including using spectrum in the 1700/2100 MHz and 2.5 GHz bands, among other frequency bands. Operators could consider making use of other spectrum bands in conjunction with or as an alternative to using 700 MHz spectrum for 4G LTE deployment purposes. However, to date, no operator has expressed interest in deploying 4G LTE services in any spectrum band other than 700 MHz.

Consequently, while there is only a limited amount of "prime" 700 MHz spectrum currently available for immediate commercial use, there is no shortage of alternative spectrum in TCI that could also be used by operators for immediate 4G LTE deployment purposes.

As stipulated by the Telecommunications Policy, Ordinance and Frequency Management Regulations, the Commission recognizes that it must ensure timely access to spectrum to deploy new services and technologies and promote and sustain competition when assigning spectrum. The Commission must also balance these objectives against other set out in the legislation, including promoting efficient spectrum use, addressing market expectations and user requirements and also taking into account effects on existing and future availability and uses of spectrum.

Taking all of these considerations into account, the Commission considers that it would only be practical and feasible to potentially assign "prime" 700 MHz spectrum to two or three of the three Applicants (i.e., LIME, Digicel and Islandcom) since they are best positioned to make immediate use of the spectrum and they have each filed applications for 700 MHz spectrum.

It is important note that this would not preclude any duly licensed operator, including any of the three existing PMT operators, from being awarded "non-prime" 700 MHz spectrum subject to demand and availability considerations. The same applies to spectrum in other frequency bands that could also be used for 4G LTE deployment purposes.

Therefore, in the context of the three Applications in front of the Commission, and with respect to "prime" 700 MHz spectrum currently available for commercial use, the Commission considers

that there are two primary options available for licensing spectrum for the purpose of supporting the deployment of 4G LTE services in TCI in the near term. The options are as follows:

**Option 1 – Each of the three licensed PMT operators would be granted "prime" 700 MHz spectrum:** Under this option, each of the three Applicants would be granted a license for some "prime" 700 MHz spectrum – i.e., a minimum of 6 + 6 or 12 MHz of "prime" 700 MHz spectrum.

**Option 2 – Two of the three licensed PMT operators would be granted "prime" 700 MHz spectrum:** In this case, two of the three Applicants would be granted a license for some "prime" 700 MHz spectrum – i.e., at least 10 + 10 or 20 MHz of "prime" 700 MHz spectrum in each case.

Each option is explained in more detail below:

***Option 1 – Three Licensed PMT Operators Granted "Prime" 700 MHz Spectrum***

Under the first option, to ensure that each of the three Applicants wishing to deploy 4G LTE services in the immediate term has the opportunity to do so using "prime" 700 MHz spectrum, each would be eligible to obtain at a minimum of 6 + 6 MHz or 12 MHz in total of "prime" 700 MHz spectrum. As set out in Table 4, each of the three Applicants would be assigned one of the following three "prime" 700 MHz paired spectrum blocks:

No.	Block(s)	Pairing	Notes
Applicant 1	Lower B	Paired	12 MHz in total
Applicant 2	Lower C	Paired	12 MHz in total
Applicant 3	Upper C	Paired	22 MHz in total

Under this option, once the Commission has reached its decision and awarded each Applicant one of the three available "prime" 700 MHz spectrum blocks, the two licensees who are granted the Lower B and C blocks, along with other licensed operators, would be permitted to apply for "non-prime" commercial use 700 MHz spectrum – i.e., the Lower A block (12 MHz) or the Lower D and E blocks of unpaired spectrum (6 MHz each or 12 MHz in total). Additional "reserved" 700 MHz spectrum could also be made available for licensing if a licensed operator identified an immediate or near term commercial and/or joint commercial and public safety use for the spectrum.

***Option 2 – Two Licensed PMT Operators Granted "Prime" 700 MHz Spectrum***

Under the second option, only two of the three Applicants would be assigned "prime" 700 MHz spectrum – i.e., either Lower B and C or Upper C as shown in Table 5 below. The objective in this case would be to ensure that each of the two Applicants granted "prime" 700 MHz spectrum would have a sufficient quantity of spectrum to immediately launch high quality/high speed 4G LTE services in TCI.

<b>No.</b>	<b>Block(s)</b>	<b>Pairing</b>	<b>Notes</b>
Applicant 1	Lower B and C	Paired	24 MHz in total
Applicant 2	Upper C	Paired	22 MHz in total

Under this option, the third Applicant would be provided with a first right of refusal for being assigned either "non-prime" 700 MHz spectrum, other 700 MHz spectrum reserved for future commercial and/or public safety uses (after the Applicant identifying an immediate or near term commercial and/or joint commercial and public safety use for the spectrum) or for spectrum in another frequency band for the purposes of deploying LTE technology (e.g., 1700/2100 MHz, 2500/2600 MHz or other frequency band).

Once the three Applicants had been awarded 700 MHz spectrum under this option, any duly licensed operator could file an application for any remaining "non-prime" and/or "reserved" 700 MHz spectrum, identifying in the latter case an immediate or near term commercial and/or joint commercial and public safety use for the spectrum.

The Commission notes that while it remains open to the adoption of either of these two options, it considers that on balance Option 2 may provide the greatest net benefit for TCI. It ensures that at least two licensed PMT operators have sufficient "prime" 700 MHz spectrum to provide high quality 4G LTE services in TCI in the immediate future, while providing a third licensed PMT operator the opportunity to do the same using either "non-prime" 700 MHz spectrum and/or spectrum in another frequency band. Option 1, on the other hand, would potentially allow only one licensed PMT to operator to launch high quality LTE services in TCI in the immediate future using "prime" 700 MHz spectrum.

With respect to the these two 700 MHz spectrum assignment options, parties are invited to respond to the following questions:

**Question 8: 700 MHz Spectrum Assignment Options: Provide your views on the Commission's two 700 MHz spectrum assignment options, indicating your preference for either Option 1 or 2 with supporting rationale. Please provide any alternative proposals you may have, with supporting rationale.**

**Question 9: Spectrum for LTE Deployment Purposes: The Initial Consultation Document focussed exclusively on the use of 700 MHz spectrum for the deployment of 4G LTE technology. Provide your views on whether 4G LTE technology could be effectively deployed using spectrum in other frequency bands (e.g., 1700/2100 MHz, 2500/2600 MHz or other frequency bands) taking into account the geography and demographics of TCI. If not, explain why not.**

**Question 10: Spectrum for LTE Deployment Purposes: Explain whether any spectrum currently assigned to your company could potentially be used for the deployment of 4G LTE services and, if so, in what time frame.**

### **4.3 Proposed Spectrum Assignment Methodology**

As explained in Section 3.8 above, the Commission considers that a FCFS spectrum assignment approach is no longer feasible for the 700 MHz spectrum band. In addition, no party responding to the Initial Consultation Document supported such an approach.

As well, as explained in Section 3.9 above, the Commission considers that the use of an auction process would be unnecessarily complex, costly and therefore disproportionate in the case at hand. Moreover, no party supported such an approach, at least as the primary means of awarding 700 MHz spectrum.

Consequently, the Commission considers that the use of a comparative selection process is the most practical and feasible method to assign 700 MHz spectrum under the circumstances in TCI. For such an approach to be effective, however, the selection criteria must be clearly defined.

In this respect, the Commission is proposing to adopt a comparative selection process involving a conditional two-stage process. The process would be dependent upon which spectrum option assignment method is adopted by the Commission in its decision in this proceeding – i.e., Option 1 or 2 as described in the previous section.

#### ***First Stage of the Comparative Selection Process***

In the first stage, the three Applicants would re-apply for a 700 MHz spectrum licence by selecting one of the specified "prime" 700 MHz spectrum block options set out under adopted spectrum assignment (i.e., Option 1 or 2 as set out in Table 4 and 5, respectively, above). If there are no overlapping spectrum block requests, then the Commission would award the requested "prime" 700 MHz spectrum licences to each Applicant (subject to the spectrum fees and licence conditions to be determined as part of this consultation process). If there are competing applications for the same spectrum blocks, however, the Commission would proceed to the second stage of the process.

#### ***Second Stage of the Comparative Selection Process***

In the second stage, assuming it is necessary, the Applicants would be required to file information in support of their spectrum licence applications which would be used to assess and rank the relative merits of each application so that the Commission could award "prime" 700 MHz spectrum on a comparative selection basis. The Commission's proposed list of required supporting information to be included in each Applicant's second-stage submission includes the following:

- i) The Applicant's first and second choice of eligible "prime" 700 MHz spectrum block options, including the rationale for the selected spectrum block choices and their ranking.
- ii) A complete summary of the spectrum licences currently held by the Applicant, their current uses and the identification of any available existing unused capacity.
- iii) A detailed description of the Applicant's 4G LTE deployment plans using the requested "prime" 700 MHz spectrum, including planned investments, service launch timing, service coverage and service features and capabilities.

- iv) As may be applicable, a detailed description of the Applicant's 4G LTE deployment plans using spectrum outside of the 700 MHz spectrum band, including planned investments, service launch timing, service coverage and service features and capabilities in this respect.
- v) A description of the Applicant's financial capability to deploy the planned 4G LTE services.
- vi) A description of the Applicant's technical capability to deploy the planned 4G LTE services, including their track record on deploying services in TCI using currently assigned spectrum.
- vii) A description of any specific benefits that would accrue to consumers or, more generally, the TCI economy associated with the Applicant's proposals.
- viii) Any other information deemed relevant by the Applicant.

The Commission proposes to place an equal weight on each of the criteria when assessing the relative merits of each licence application.

The Commission notes that, if necessary, these same selection criteria could also be used to award "non-prime" or "reserved" 700 MHz spectrum should competing requests be made for this spectrum.

With respect to the these 700 MHz spectrum assignment methodology proposals, parties are invited to respond to the following questions:

**Question 11: Spectrum Assignment Methodology: Provide your views on the Commission's conditional two-stage comparative selection process for awarding 700 MHz spectrum. Please provide any alternative proposals you may have, with supporting rationale.**

**Question 12: Stage Two Comparative Selection Criteria: Provide your views on the proposed second-stage comparative selection criteria, including what specific criteria you consider should be either added to or deleted from the list, if any, with supporting rationale. In addition, provide your views on the possible relative weighting of the criteria.**

#### **4.4 Proposed 700 MHz Spectrum Licence Fees**

While the Commission intends to conduct a comprehensive review of all existing spectrum fees, including the methodology used to determine them, in the future, such a review is not within the scope of this current consultation. Consequently, the Commission is of the view that 700 MHz spectrum licence fees should be set in relation to existing fees for other licensed PMT spectrum in TCI. In addition, the Commission considers that it would also useful to take into account 700 MHz spectrum licence fees in other Caribbean jurisdictions, where available, as a further test of reasonableness.

The current annual PMT spectrum licence fees in effect in TCI are summarized in Table 6. They are reported as shown in the *2007 Telecommunications Fee Structure Regulations*, Schedule 3, and also expressed on a per MHz per population ("pop") basis. The current average spectrum fee comes to 8.3¢/MHz/pop.

<b>Table 6: Current PMT Spectrum Licence Fees in TCI</b>		
<b>Spectrum Band</b>	<b>Annual Fee *</b>	<b>Annual Fee/MHz/pop**</b>
<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.

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

The Commission has conducted a survey of 700 MHz spectrum licence fees in a number of Caribbean jurisdictions and, for comparison purposes, it has converted the fees to a common currency and basis, namely: USD/MHz/pop per annum. The detailed results are summarized in Annex 3.

It should be noted that the basis for setting spectrum licence fees varies from jurisdiction to jurisdiction. For instance, 700 MHz fees in the case of Trinidad and Tobago, US Virgin Islands and Puerto Rico were set through spectrum auctions. In other surveyed jurisdictions, the fees were set by government or regulatory agencies. In some of these cases general PMT spectrum fees have been set that are independent of individual spectrum bands – i.e., they are effectively service-based rather than spectrum band-based fees. The ECTEL Member States, for instance, fall into this category. In such cases, the service-based PMT spectrum fees are assumed to also apply to 700 MHz spectrum even in cases where 700 MHz spectrum is yet to be licensed (as in the case of Antigua and Barbuda, Barbados and the ECTEL Member States). Other 700 MHz spectrum fees have been set by regulatory agency, as in the case of the Bahamas. The Commission found no evidence of any spectrum fees in the surveyed jurisdictions that were set solely to recover spectrum administration costs.

The Commission's findings, based on available information, indicate that the average 700 MHz spectrum fee in the surveyed Caribbean jurisdictions is US 6.2¢/MHz/pop.

Without normalizing for factors such as per capita income and population density, this finding supports setting a fee for 700 MHz spectrum in TCI which is greater than the current 850/900 MHz fee of 3.9¢/MHz/pop, but less than the current 1900 MHz fee of 20.3¢/MHz/pop. Indeed, within that range, the result supports setting a 700 MHz spectrum fee that is much closer to the lower end of the range.

Therefore, on a preliminary basis, the Commission proposes to set the 700 MHz spectrum fee closer to lower end of this range, namely at a rate of \$30,000 per 6 MHz of paired spectrum, which is equal to 6.5¢/MHz/pop. This rate falls close to but slightly above the average rate

found in the surveyed Caribbean jurisdictions and below the current average spectrum fee in TCI of 8.3¢/MHz/pop.

The Commission considers that this proposed fee should apply to "prime" 700 MHz spectrum, whereas that a somewhat lower fee should apply to "non-prime" 700 MHz spectrum in recognition of the latter's lower immediate term value. Accordingly, on a preliminary basis, the Commission proposes that at a fee of \$20,000 per 6 MHz of paired spectrum should apply to "non-prime" 700 MHz spectrum. This proposed fee of 4.3¢/MHz/pop is close to but still somewhat higher equal to the current 850/900 MHz spectrum fees. Therefore, "non-prime" 700 MHz spectrum fee would be set at close to a one-third discount relative to "prime" 700 MHz spectrum.

On this basis, Table 7 presents the proposed annual spectrum fees that would apply to the "prime" and "non-prime" 700 MHz spectrum blocks:

<b>Table 7: Proposed 700 MHz Spectrum Licence Fees in TCI for Designated Spectrum Block Options</b>			
<b>Block(s)</b>	<b>Total Spectrum</b>	<b>Classification</b>	<b>Annual Fee</b>
<b>Lower B</b>	12 MHz	Prime	\$30,000
<b>Lower C</b>	12 MHz	Prime	\$30,000
<b>Upper C</b>	22 MHz	Prime	\$55,000
<b>Lower A</b>	12 MHz	Non-Prime	\$20,000
<b>Lower D</b>	6 MHz	Non-Prime	\$10,000
<b>Lower E</b>	6 MHz	Non-Prime	\$10,000

The Commission notes that would also consider applying the proposed "non-prime" 700 MHz spectrum fee of roughly 4.3¢/MHz/pop in the case of spectrum requested in other frequency bands for the purposes of deploying LTE.

With respect to the these 700 MHz spectrum fee proposals, parties are invited to respond to the following questions:

**Question 13: Proposed Spectrum Fees: Provide your comments on the Commission's proposed "prime" and "non-prime" 700 MHz spectrum fees and the approach used to derive them. Please provide any alternative proposals you may have, with supporting rationale.**

**Question 14: Spectrum Fee Survey Results: Provide your comments on the survey of 700 MHz spectrum fees included in Annex 3, including identifying any revisions and/or additions you consider appropriate with supporting references and explanations.**

## 4.5 Proposed Conditions of Licence

The Commission proposes to apply several conditions on all granted 700 MHz spectrum licences, including licence term, deployment commitments and safeguards.

### *Licence Term*

The Commission intends to apply a ten year licence term to all 700 MHz spectrum licences. The likelihood of licence renewal at the end of the ten-year period would be high as long as licensees have complied with their licence deployment commitments as set out below.

### *4G LTE Deployment Commitments*

All of three Applicants indicated in their responses to the Initial Consultation Document that they required 700 MHz spectrum to deploy 4G LTE services and, if granted a licence, they planned to build out 4G LTE network technology in TCI in the immediate to near term. Therefore, the Commission considers that to ensure that any "prime" 700 MHz spectrum licence that may be granted is used to as quickly as possible to deploy 4G LTE services in TCI, the Commission proposes to include deployment and coverage commitments as conditions of licence for any operator granted a "prime" 700 MHz license. In particular, the Commission proposes to apply the following two "prime" 700 MHz spectrum conditions of licence:

- i) The licensee must deploy 4G LTE technology using the awarded "prime" 700 MHz spectrum within 18 months of the issuance of its 700 MHz spectrum licence.
- ii) The licensee must cover 100% of the population of TCI with 4G LTE-based services within 36 months of the issuance of its "prime" 700 MHz spectrum licence.

The intent of these conditions of license are to ensure that any "prime" 700 MHz spectrum licenses that may be granted are put to use as quickly as possible and that as many TCI consumers and businesses as possible will benefit from the deployment of 4G LTE based services.

The Commission notes, however, that while its stated primary objective of licensing 700 MHz spectrum is to facilitate the deployment of 4G LTE technology in TCI, the Commission would be prepared to grant exemptions from these conditions of licence where a licence applicant makes a compelling case for the deployment of an alternative technology or application using "non-prime" 700 MHz spectrum band. As per the proposed comparative selection criteria noted above, licensing preference would be given to applicants seeking to deploy 4G LTE technology. However, consistent with the principle of technology neutrality, the Commission would consider licensing other technologies in the "non-prime" 700 MHz spectrum band as long as they did not raise interference concerns.

### *Deployment Compliance Safeguards*

As noted, the proposed term of 700 MHz spectrum licences is ten years, whereas the 4G LTE technology deployment commitments for licensed "prime" 700 MHz spectrum apply in the initial

years of the licence. Consequently, the Commission considers that an additional safeguard in the form of a performance bond may be necessary to ensure that any licensed PMT operator awarded a "prime" 700 MHz spectrum licence follows through with the required deployment commitment and does and not merely “warehouse” the spectrum.

The Commission is open to comments from Respondents in relation to the value of the performance bond, but considers that its value could be set relative to the total value of the spectrum licence fees for the full 10 year licence term.

With respect to these proposed 700 MHz spectrum licence conditions, parties are invited to respond to the following question:

**Questions 15: Licence Conditions: Provide any comments you may have on the Commission’s proposed 700 MHz licence (i) term, (ii) spectrum deployment and population coverage commitments and (iii) deployment commitment safeguard (and value). Please provide any alternative proposals you may have, with supporting rationale.**

#### 4.6 Proposed Implementation Process

The Commission considers that the "prime" 700 MHz spectrum assignment options set out above could be implemented relatively quickly once a decision is issued on this consultation process. In particular, the first stage of the conditional two-stage comparative selection spectrum assignment process could be completed within 6 weeks of the Commission's decision. Should a second stage process prove necessary, Applicants would be required to file second-stage spectrum application submissions within a further 6 week period. The Commission would then endeavour to complete the resulting comparative selection process within three months of that date. Assuming the second stage process is required, the Commission estimates that it should be in a position to award "prime" 700 MHz spectrum licences before the end of first quarter 2013.

The estimated implementation timeline is set out in Table 8.

<b>Event</b>	<b>Timeframe</b>	<b>Estimated Date</b>
Commission Second Consultation Decision		August, 2012
Stage 1 "Prime" 700 MHz Spectrum Applications	6 weeks	October 2012
Stage 2 "Prime" 700 MHz Spectrum Applications (if necessary)	6 weeks	December 2012
Commission "Prime" 700 MHz Licensing Decision Following Stage 1 (if possible) Following Stage 2 (if necessary)	12 weeks	October 2012 First Quarter 2013

The Commission notes that under "prime" 700 MHz spectrum assignment Options 1 and 2, any Applicant ultimately awarded less than 20 MHz of "prime" 700 MHz spectrum would be eligible to acquire "non-prime" or "reserved" 700 MHz spectrum, should they be interested in doing so. Further, under Option 2, the third Applicant not awarded any “prime” 700 MHz spectrum would

be provided with a first right of refusal for with being assigned spectrum in another frequency band for the purposes of deploying LTE technology (e.g., 1700/2100 MHz, 2500/2600 MHz or other frequency band).

The Commission intends to address any such requests after it has issued a decision with respect to the licensing of "prime" 700 MHz spectrum. However, there would be nothing preventing any of the three Applicants from identifying any interest it may have in "non-prime" or "reserved" 700 MHz spectrum during the second stage application process in the event it were not awarded its first or second choice of "prime" 700 MHz spectrum.

With respect to the proposed implementation approach and timing, parties are invited to respond to the following question:

**Questions 16: Implementation Process: Provide any comments you may have on the Commission's proposed "prime" 700 MHz spectrum licence comparative selection implementation process and timelines. Please provide any alternative proposals you may have, with supporting rationale.**

## 5 Summary of Consultation Questions

Question 1: FCC Channel Plan: Do you agree with the Commission's proposal to adopt the FCC 700 MHz spectrum channel plan for TCI? If not, explain why not and provide a specific alternative proposal with supporting rationale.

Question 2: Public Safety Spectrum Reserve: Do you agree with the Commission's proposal to reserve for future use the 700 MHz spectrum designated for public safety use under the FCC channel plan (i.e., 763-775 MHz paired with 793-805 MHz)? If not, explain whether there are any immediate or near term commercial uses for this spectrum, in whole or part, that could also support future public safety requirements.

Question 3: Upper D Block Reserve: Do you agree with the Commission's proposal to reserve the Upper D block designated for public safety use under the FCC channel plan for future public safety and/or commercial use? If not, explain whether there are any immediate or near term commercial uses for the Upper D block.

Question 4: Band 14: Digicel proposed that Band 14 (i.e., as illustrated in Annex 1, 758-768 MHz paired with 788-798 MHz, 20 MHz in total) could be licensed for commercial uses. This band includes the Upper D block and part of the public safety spectrum reserve. Comment on whether there are any immediate or near term commercial uses for this specific spectrum band.

Question 5: Lower A Block: Comment on whether there are any immediate or near term practical and economic options for deploying LTE-based services in TCI in the Lower A block in comparison to the Lower B, C and/or Upper C blocks.

Question 6: Unpaired Lower D and E Blocks: Comment on whether there are any immediate or near term commercial uses in TCI for the unpaired Lower D and E blocks, and also comment on their relative attractiveness compared to the Lower B, C and/or Upper C blocks.

Question 7: "Prime" Spectrum Blocks: Comment on whether you agree that the Lower B, Lower C and Upper C to be the relatively more desirable or "prime" 700 MHz spectrum blocks available for commercial use in TCI at this time.

Question 8: 700 MHz Spectrum Assignment Options: Provide your views on the Commission's two 700 MHz spectrum assignment options, indicating your preference for either Option 1 or 2 with supporting rationale. Please provide any alternative proposals you may have, with supporting rationale.

Question 9: Spectrum for LTE Deployment Purposes: The Initial Consultation Document focussed exclusively on the use of 700 MHz spectrum for the deployment of 4G LTE technology. Provide your views on whether 4G LTE technology could be effectively deployed using spectrum in other frequency bands (e.g., 1700/2100 MHz, 2500/2600 MHz or other frequency bands) taking into account the geography and demographics of TCI. If not, explain why not.

Question 10: Spectrum for LTE Deployment Purposes: Explain whether any spectrum currently assigned to your company could potentially be used for the deployment of 4G LTE services and, if so, in what time frame.

Question 11: Spectrum Assignment Methodology: Provide your views on the Commission's conditional two-stage comparative selection process for awarding 700 MHz spectrum. Please provide any alternative proposals you may have, with supporting rationale.

Question 12: Stage Two Comparative Selection Criteria: Provide your views on the proposed second-stage comparative selection criteria, including what specific criteria you consider should be either added to or deleted from the list, if any, with supporting rationale. In addition, provide your views on the possible relative weighting of the criteria.

Question 13: Proposed Spectrum Fees: Provide your comments on the Commission's proposed "prime" and "non-prime" 700 MHz spectrum fees and the approach used to derive them. Please provide any alternative proposals you may have, with supporting rationale.

Question 14: Spectrum Fee Survey Results: Provide your comments on the survey of 700 MHz spectrum fees included in Annex 3, including identifying any revisions and/or additions you consider appropriate with supporting references and explanations.

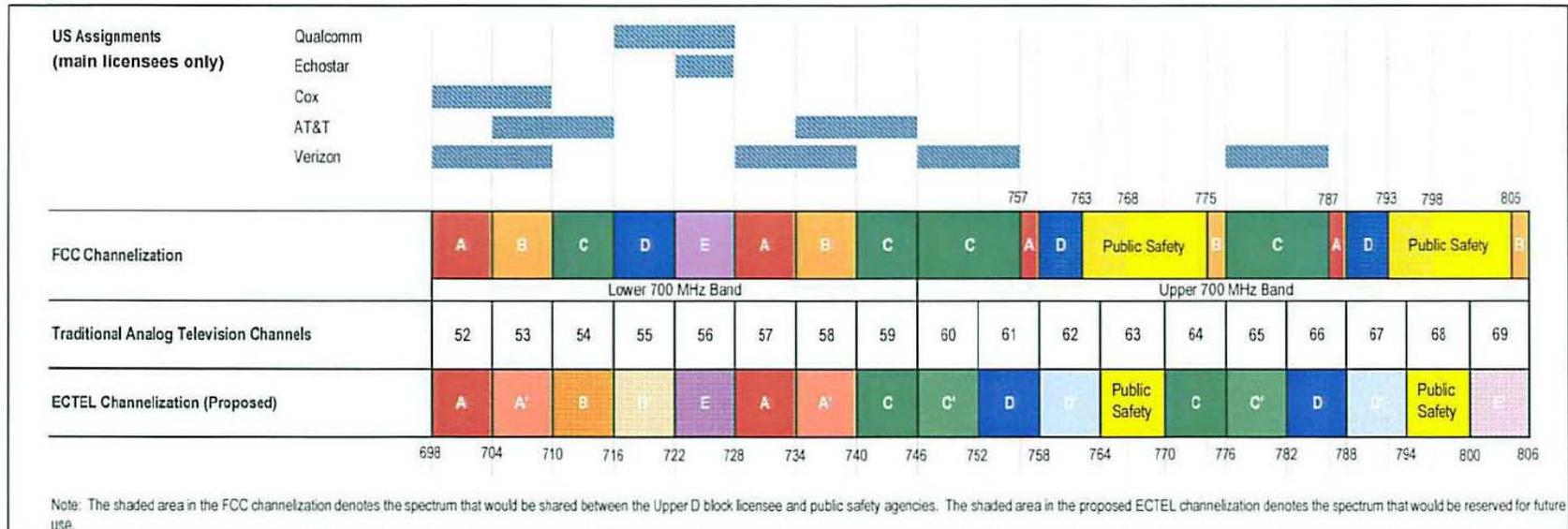
Questions 15: Licence Conditions: Provide any comments you may have on the Commission's proposed 700 MHz licence (i) term, (ii) spectrum deployment and population coverage commitments and (iii) deployment commitment safeguard (and value). Please provide any alternative proposals you may have, with supporting rationale.

Questions 16: Implementation Process: Provide any comments you may have on the Commission's proposed "prime" 700 MHz spectrum licence comparative selection implementation process and timelines. Please provide any alternative proposals you may have, with supporting rationale.

Interested parties are also welcome to comment on any other issue that they deem relevant to this consultation.

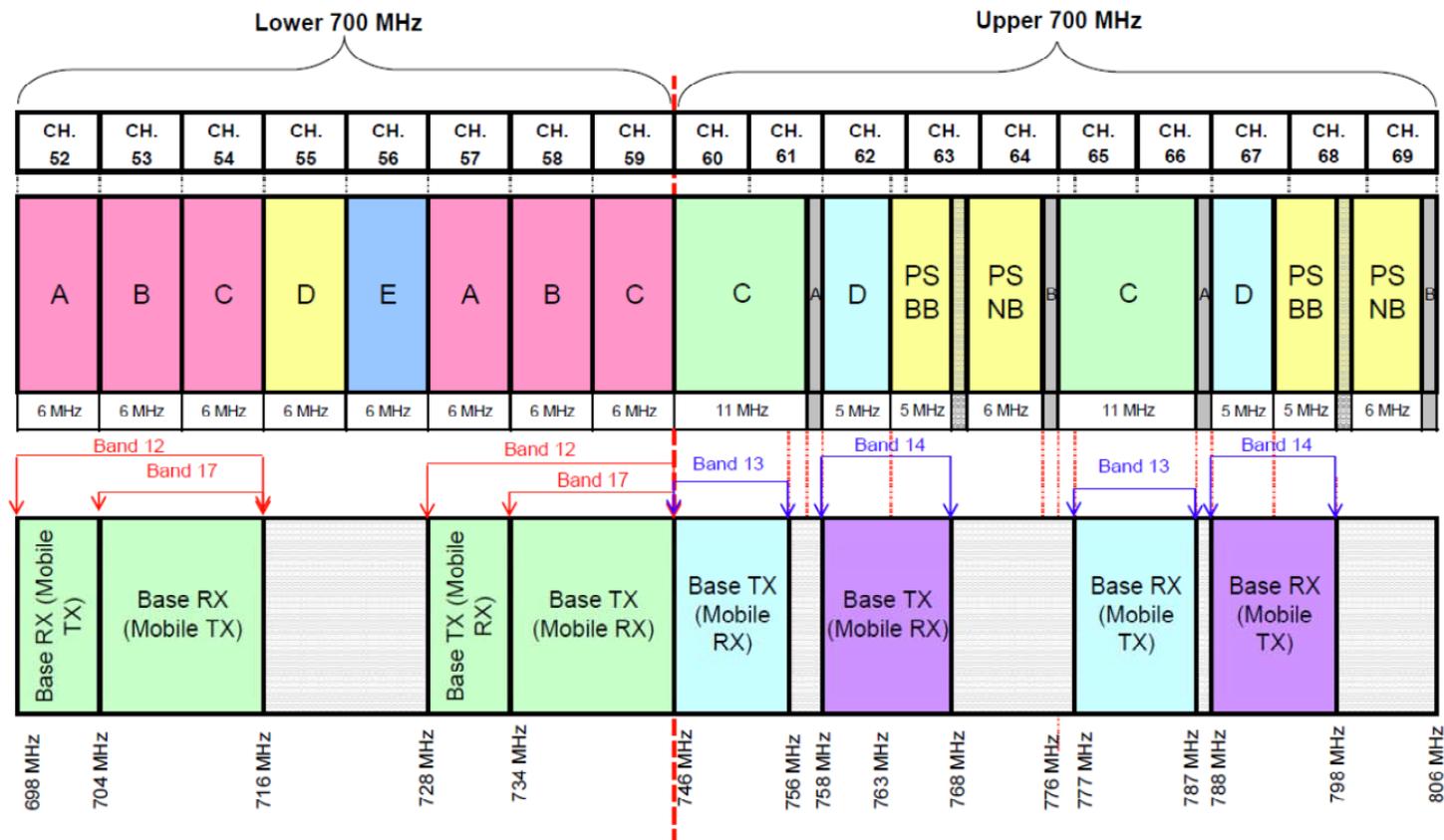
## Annex 1 – FCC vs ECTEL 700 MHz Spectrum Plans

Figure A1-1  
Channelization of the 700 MHz Spectrum under the FCC and ECTEL Plans



Note that in terms of 700 MHz spectrum holdings in the USA, Verizon has recently undertaken to transfer its Lower A and B block holdings to cable companies (including Cox) in exchange for 1700/2100 AWS spectrum. In addition, AT&T has recently undertaken to acquire Qualcomm's Lower D and E block holdings.

Figure A1-2  
 FCC Channel Plan Detail and 3GPP Technical Equipment Specifications Equipment



## Annex 2 – Survey of 700 MHz Spectrum Policies in Caribbean Jurisdictions

To assist with the development of the Revised 700 MHz Spectrum Policy set out in this Second Consultation Document, the Commission conducted a survey of 700 MHz spectrum policies in the Caribbean region, as applicable. In total, 28 Caribbean jurisdictions were taken into account,<sup>6</sup> all of which are listed in Table A2-1 below.

The objective of the survey was to gain an understanding of the various approaches adopted or under consideration with respect to the licensing of 700 MHz spectrum for 4G LTE purposes. In this respect the Commission took into account the following factors:

- **Planned use of the 700 MHz Spectrum Band:** Given that most jurisdictions in the Caribbean region follow ITU Region 1 spectrum designations, most of the surveyed jurisdictions have accordingly designated the 700 MHz band for 4G wireless use. However, there are some Caribbean jurisdictions with close European ties that have designated or are contemplating designating the 800 MHz band for this same purpose (i.e., following established ITU Region 2 designations) – including jurisdictions within the French West Indies and some of the jurisdictions within the former Netherlands Antilles. The Commission has restricted its focus to those jurisdictions that have, like TCI, designated the 700 MHz band for 4G wireless use. This reduces the number of relevant jurisdictions from 28 to 20.
- **700 MHz Policy Consultations:** For each relevant jurisdiction, it was determined whether a public consultation on 700 MHz policy matters had been initiated. As can be seen from the summary table, 12 jurisdictions have initiated or completed 700 MHz policy consultations to date. In some jurisdictions, rather than hold a consultation process, existing spectrum policies have been extended to the 700 MHz band (as in the cases of Anguilla and Barbados). In other cases (i.e., Dominican Republic and Jamaica), the DSO (analog to digital television switchover) will not have been completed until 2015; as a result, no 700 MHz policy consultation process has been initiated as of yet.
- **Formal 700 MHz Policy Framework:** Of those jurisdictions that undertook public consultations, 11 have issued 700 MHz policy decisions. The bulk of this group is made up of the 5 ECTEL Member States. The others are the Bahamas, the British Virgin Islands, the Cayman Islands, Trinidad and Tobago, Puerto Rico and US Virgin Islands. In some cases, however, while policy decisions have been issued, further 700 MHz policy matters must still be addressed (e.g., license assignment methodology in the case of the ECTEL Member States).

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<sup>6</sup> Information provided on the applicable government/regulatory agency's website was taken into account and, where necessary, the agencies were also contacted directly.

- **700 MHz Channel Plan:** For those jurisdictions with either comprehensive or partial 700 MHz policy frameworks in place, either the ECTEL or FCC channel plans have been adopted. All of the ECTEL Member States have, of course, adopted the ECTEL channel plan. The Bahamas has also adopted the ECTEL plan, and Antigua and Barbuda indicated that it is likely to do so as well. On the other hand, Anguilla, Barbados, Cayman Islands, Puerto Rico, Trinidad and Tobago, and the US Virgin Islands have adopted the FCC plan. Consequently, there is roughly an equal split between the two alternative channel plans.
- **Public Safety Set-Aside:** Virtually all jurisdictions with either comprehensive or partial 700 MHz policy frameworks in place, have decided to reserve spectrum in the Upper 700 MHz for public safety use, although there is some variation in the specific amount of spectrum depending on whether the ECTEL or FCC channel plan is being followed.
- **Spectrum Caps:** In several jurisdictions, caps have been imposed on the amount of 700 MHz spectrum any one licensed operator will be awarded. In the case of the Bahamas and the ECTEL Member States the spectrum cap is 24 MHz. The British Virgin Islands have adopted a broader spectrum cap of 60 MHz which applies to sub 1 GHz spectrum held by any one licensed operator. Otherwise, no explicit spectrum caps were adopted in other jurisdictions with comprehensive or partial 700 MHz policy frameworks in place.
- **700 MHz Spectrum Assignment Methodology:** Among those jurisdictions with 700 MHz policy frameworks in place, various approaches have been adopted or are planned to be used for awarding spectrum 700 MHz spectrum licences – i.e., first-come, first-served ("FCFS"), tender or request for proposal ("RFP"), comparative selection and auction processes. Trinidad and Tobago, Puerto Rico and the US Virgin Islands have relied on auction processes to award 700 MHz spectrum. The latter two jurisdictions, being US territories, were covered by the US 700 MHz auction. The remaining jurisdictions have or intend to rely on FCFS, RFP or comparative selection processes.
- **700 MHz Spectrum Applications:** As shown the summary table, other than the three noted jurisdictions which have already held auctions, there is only one jurisdiction with filed 700 MHz spectrum applications, namely Barbados. In the case of the Bahamas, the regulator recently invited eligible licensed operators to file applications for 700 MHz spectrum which will be evaluated using a defined comparative selection process.
- **700 MHz Spectrum Licences Awarded:** Here again, other than in the jurisdictions which have already held auctions, only Barbados has currently awarded 700 MHz spectrum licences to date.

In sum, the 700 MHz spectrum policies in most of the surveyed jurisdictions remain in development or, at best, are in the very early stages of implementation. A variety of policy approaches have been adopted or considered. It is notable, that jurisdictions relying on the FCC channel plan have been the first to award 700 MHz spectrum licences and, therefore, the first to allow deployment of 4G LTE services.

Table A2-1

700 MHz Spectrum Policies in Selected Caribbean Jurisdictions

Jurisdiction	700 MHz Band 4G adoption (some jurisdictions have adopted ITU Region 1 800 MHz band for LTE)	700 MHz Band Public Consultation Process (date where applicable) (some awaiting completion of broadcasting digital switchover (DSO))	700 MHz Policy In Place (date where applicable)	700 MHz Channel Plan (where applicable)	Public Safety Set-aside (where applicable)	Spectrum Caps (where applicable)	700 MHz Assignment Methodology (where applicable)	700 MHz Licence Applications (dates)	700 MHz Licences granted (dates)
Anguilla	Yes	No	Yes	FCC	Yes		Likely FCFS	No	No
Antigua & Barbuda	Yes	No	No	Likely ECTEL	Yes		Likely FCFS	Yes	No
Bahamas	Yes	Yes (2011)	Yes (2012)	ECTEL	Yes	24 MHz	Tender	Requested	No
Barbados	Yes	NA	Yes	FCC	Yes		FCFS/RFP	Yes	Yes
Bermuda	Yes	Yes (2009), broadcaster in 700 MHz band	No					No	No
British Virgin Islands	Yes	Yes (2011)	In Part (2011)			60MHz < 1 GHz	Likely Comp Selection	NA	No
Cayman Islands	Yes	Yes (2009/11)	In Part (2011)	Likely FCC	Likely Yes		FCFS for LTE	NA	No
Dominican Republic	Yes	DSO announced for 2015	No						
<b>ECTEL Member States</b>									
Dominica	Yes	Yes (2008/09)	In Part (2009)	ECTEL	Yes	24 MHz	Under Review	No	No
Grenada	Yes	Yes (2008/09)	In Part (2009)	ECTEL	Yes	24 MHz	Under Review	No	No
St Kitts & Nevis	Yes	Yes (2008/09)	In Part (2009)	ECTEL	Yes	24 MHz	Under Review	No	No
St Lucia	Yes	Yes (2008/09)	In Part (2009)	ECTEL	Yes	24 MHz	Under Review	No	No
St Vincent & Grenadines	Yes	Yes (2008/09)	In Part (2009)	ECTEL	Yes	24 MHz	Under Review	No	No
<b>French West Indies</b>									
Guadeloupe	No (adopted Region 1 800 MHz band)	NA							
Martinique	No (adopted Region 1 800 MHz band)	NA							
St. Bartholomew	No (adopted Region 1 800 MHz band)	NA							
St. Martin	No (adopted Region 1 800 MHz band)	NA							
<b>Former Netherlands Antilles &amp; Aruba</b>									
Aruba	Yes	Ongoing Sector Discussions	No						
Bonaire	May adopt 700 MHz and/or 800 MHz band	Ongoing Sector Discussions	No						
Curacao	Yes	Ongoing Sector Discussions	No						
Saba	May adopt 700 MHz and/or 800 MHz band	Ongoing Sector Discussions	No						
St. Eustatius	May adopt 700 MHz and/or 800 MHz band	Ongoing Sector Discussions	No						
St. Maarten	May adopt 700 MHz and/or 800 MHz band	Ongoing Sector Discussions	No						
Jamaica	Yes	DSO announced for 2015	No						
Montserrat	Yes	No	No						
Trinidad & Tobago	Yes	Yes (2008)	Yes (2008)	FCC	TBD		Auction (2008 & 09)	Yes	Yes
US Virgin Islands	Yes	Yes	Yes	FCC	Yes		Auction (2008)	Yes	Yes
(US) Puerto Rico	Yes	Yes	Yes	FCC	Yes		Auction (2008)	Yes	Yes

## **Annex 3 – Survey of Spectrum Licence Fees in Caribbean Jurisdictions**

As part of its survey of survey of 700 MHz spectrum policies in neighbouring Caribbean jurisdictions, the Commission also collected information, where available, on applicable 700 MHz spectrum licence fees. The objective of this exercise was not to use this information for benchmarking purposes, but rather as a test of reasonableness for the Commission's proposed 700 MHz spectrum license fees for TCI.

In total, 700 MHz spectrum license fee information was collected for 12 of the surveyed jurisdictions listed in the previous Annex. These include the three jurisdictions that have held 700 MHz spectrum auctions to date – i.e., Trinidad and Tobago, Puerto Rico and the US Virgin Islands. In the latter case, the auction rates shown in Table A3-1 below are for specific 700 MHz spectrum blocks covering the geographic areas of Puerto Rico and the US Virgin Islands (rather than the contiguous USA), expressed on an annual \$US/MHz/population (pop) basis. They also include Anguilla and the Bahamas that have 700 MHz spectrum specific license fees in place which have been set by their respective regulatory agencies with spectrum management responsibilities.

The remaining jurisdictions listed in Table A3-1 have general PMT licence fees in place that cover 700 MHz spectrum licences, as well as other PMT frequency bands. These include Antigua & Barbuda, Barbados and the five ECTEL Member States (i.e., Dominica, Grenada, St Kitts & Nevis, St Lucia and St Vincent & the Grenadines).

The Commission is aware that some Caribbean jurisdictions do not charge spectrum licence fees. However, since this is not the approach followed in TCI, any such jurisdictions are not taken into account for the purpose of calculating average 700 MHz spectrum licence fees in the surveyed jurisdictions.

As can be seen in Table A3-1, the average annual 700 MHz spectrum licence fee in the surveyed jurisdictions is 6.2¢/MHz/pop.

Table A3-1 – 700 MHz Licence Fees in Caribbean Jurisdictions

Jurisdiction	700 MHz Spectrum Licence Fee		Basis for Spectrum Licence Fee
	Annual Fee	\$US/MHz/pop/year	
Anguilla	EC\$120,000/12MHz	24.0¢	Band specific
Antigua & Barbuda	EC\$10,000/MHz	4.2¢	Service specific
Bahamas	\$7,000/MHz *	2.0¢	Band specific
Barbados	\$20,000 for 1st MHz, \$500/MHz thereafter **	0.4¢	Service specific
Dominica	EC\$300,000 for 1st 15 MHz, EC\$10,000/MHz thereafter ***	8.7¢	Service specific
Grenada	Same as Dominica	5.7¢	Service specific
St Kitts & Nevis	Same as Dominica	11.4¢	Service specific
St Lucia	EC\$10,000/MHz	4.3¢	Service specific
St Vincent & the Grenadines	Same as Dominica	5.4¢	Service specific
Trinidad & Tobago	NA	0.4¢	Set by Auction
US Virgin Islands	NA	4.1¢	Set by Auction
(US) Puerto Rico	NA	4.1¢	Set by Auction
<b>Average</b>		<b>6.2¢</b>	

Sources: the respective regulatory agency websites and/or direct contact with the agencies.

World Bank used for population estimate, generally for the year 2010.

\* Interim rate in the Bahamas between \$6,000 and \$8,000/MHz.

\*\* Estimated fee based on calculation for 10 MHz of spectrum.

\*\*\* Estimated fee based on calculation for 25 MHz of spectrum.