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John Williams
Director General
Turks & Caicos Telecommunications Commission
Business Solutions Building
Leeward Highway
Providenciales
Turks & Caicos Islands

Dear Mr. Williams,

Please find below Digicel TCI's response to the TCI Telecommunications Commission request for comments on its Spectrum Allocations Pertaining to the 700 MHz Band Document.

1. The Commission proposes to divide the 700 MHz spectrum in the Turks and Caicos Islands based on 18 channels of 6 MHz each, rather than follow the FCC approach.

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?

Answer 1: The Turks and Caicos should adopt the FCC approach. As intimated in its own consultation document, the great advantage of adopting the US approach is that there will be available a healthy range of suitable network equipment and handsets and at reasonable prices. By fragmenting the spectrum and following a different course the Turks and Caicos will be condemned to higher prices and reduced development compared to large countries. The only possible exception to this is the reserve of spectrum for public safety use. However if this is not required the Commission should allow the operators to commit it to productive use.

The actual channelization should be:

Channel 12: 698 to 716 Mhz, and 728 to 746 MHz

Channel 13: 746 to 756, and 777 to 787 MHz

Channel 14: 758 to 768 MHz, and 788 to 798 MHz

2. The Commission further proposes that one or more 6 MHz RF channels in the lower band be split into 1 MHz, 1.5 MHz and/or 2 MHz sub-blocks for the award of spectrum licences with smaller bandwidths to operators.

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.

Answer 2: we see this as an option of last resort. Splitting the blocks in this way will undermine the potential of LTE to provide super high data speeds. We think that it would be best to stick with the FCC allocation scheme.

3. The Commission proposes that the band should be used for broadband wireless service with a portion being designated for Public Health and Safety Services. Applying the principle of technology neutrality providers can deliver any service on the band with any technology of their choosing after they have obtained a licence for the service and obtained requisite frequency authorizations.

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?

Answer: we agree with an approach based on technology neutrality. Another stipulation is that different systems must be able to interoperate without causing interference.

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

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?

Answer 4a: April 2012 onwards would be a good time to begin deployment. End user devices will then be in production in mass market volumes and at mass market prices (if the US band plan is used) and will be better developed than currently.

Answer 4b: there are a huge range of potential applications: in the short term LTE can provide mobile broadband services for dongles (and therefore laptops and other LTE connectable devices including some cameras), tablets, smartphones. Eventually we envisage that LTE chips could be inserted in to most if not all man made devices and build them in to the mobile web. For just a few of the possible applications see the following video:

<http://www.youtube.com/watch?v=oQNLehyD7kw>

Answer 4c: Digicel is in the middle of an upgrade project for all our networks in the region. We have a plan to begin to install LTE networks as soon as the technology is ready for wide scale deployment. Obtaining spectrum in the 700MHz band is a crucial part of this strategy.

5. Operators have in the past made requests and inquiries for the Commission to award them the entire capacity of an un-opened spectrum band. The Commission proposes not to award an entire spectrum band to a single operator; the Commission therefore will seek to award an optimum amount of spectrum to each licensee to provide the allocated services.

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.

Answer 5: the answer here depends on what is defined to be optimum. It will not be optimum to split up the 700MHz spectrum in to small chunks as that will defeat the major advantage of LTE technology in terms of enabling super high speed data transmission.

Operators could be made to show that they are going to use bandwidth within a particular timeframe and not merely sit on the spectrum allocated. Operators should also have some track record in rolling out data networks elsewhere and not just be a speculator. The spectrum would ideally be split up in to two main blocks as indicated in our response to question 1 since that will enable the maximum data specs. The possibility exists to use the remaining spectrum reserved for public safety under the FCC approach for a third operator if desired.

6. The estimated demand for this band, based on applications received and expressions of interest, exceeds the amount of available spectrum especially when one considers reserving for future expansion while catering for Public Health and Safety Services. It is further expected that demand for the band will continue to increase. The Commission proposes that 12 MHz of spectrum per operator would be sufficient.

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?

Answer: the following illustrates possible maximum data speeds based on different allocations of spectrum:

Paired Bandwidth MHz	Total Bandwidth MHz	Downlink Cell Peak Rate (Mbps)	Uplink Cell Peak Rate (Mbps)
20	40	150	75
15	30	113	57
10	20	75	38
5	10	38	19

With an allocation of only 12 MHz it can be seen that the possible speeds would be limited to only about 25% of the capabilities of the technology. That would therefore not be optimal. Optimal use will mean ensuring that operators can offer their customers the maximum speeds, or as close to them as possible, that the technology can deliver – at least 75% of the maximum speeds we would suggest. This is crucial in terms of enabling LTE to be a game changer in terms of the impact it can have on people's lives and the services they can obtain, as opposed to merely being a significant improvement over 2G and 3G technologies. Depending on the final decision about channelization we suggest ideally either 40MHz per operator; alternatively, and second best, 36 Mhz per operator.

We can provide our views on how to split up the spectrum in to more pieces if the Commission wishes us to do so.

7. The Commission has reserved the bands 163-173 MHz, 453-458 MHz, 3480-3500 MHz and 3580-3600 MHz for Public Safety and Government use and agreed that additional bands may be included on an as needed basis.

The Commission invites all respondents, in particular the public safety and commercial stakeholders, to provide comments 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?**

Answer: we envisage that the authorities are likely to use the network of one of the operator's networks in the TCI rather than building a separate safety system in which case there would be no need for a separate allocation of spectrum in this respect. However, see our response to question 11.

8. The Commission notes that, traditionally, spectrum has been assigned on a first come first-served basis in the Turks and Caicos Islands. An alternative method of assignment would be a comparative selection method.

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?

Answer: a first come first served basis for allocation would encourage operators to apply speculatively for spectrum far in advance of ever being required to need it and irrespective of the merits of their network and service plan. Therefore a fairer approach is probably to use a comparative selection or "beauty contest" process.

9. Given the particular characteristics of the 700 MHz spectrum, and the interest expressed by several operators in obtaining a portion of this spectrum, the Commission considers that it may be appropriate to use another methodology in this case. The Commission considers, in particular, two allocation methodologies; auctions or administrative pricing.

Auction is a process of buying spectrum offered for sale and assigning to the winning bidder. Auctions come in many forms and it is considered that they are best applied when determining the true market value of the resource. Auctions would require technical expertise to set pre-qualifying prices and managing the bidding and schedule of payments.

There are four primary types of auction:

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

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?

Answer: we think the answer here is best informed by considering what the best policy for spectrum allocation is. Some governments may see it as a chance to raise as much money as possible and therefore create a mechanism and choose particular auction rules that drive the price as high as possible. This is the wrong policy in our view. It discourages investors and weakens those investors that do bid successfully at the expense of consumers and the economy by leaving a greater debt overhang which weakens operator's ability to invest or to raise cash to finance further investment.

Instead, the aim should be to ensure that the person or persons who can provide most benefit to consumers and the country with that spectrum obtain it at the lowest price possible. This policy will encourage the best investors in to the market place.

Consequently, in our view, a price at the lower end should be set and an administrative pricing approach or "beauty contest" should be adopted.

If an auction process were to be used we would advocate an English auction structured in a way which ensures that the price paid is minimised. A pre-qualification stage would be required to evaluate whether the prospective bidder could deliver on their proposed plans. An English auction with its iterative bidding process normally has the advantage of combining the shared wisdom of the market about a realistic price for the spectrum, and provided that the auction rules are not designed to drive the price up to the highest levels possible. However it can lead to bidding frenzy in some circumstances. Therefore we suggest that there would be no more than one round per day if an auction of this sort is chosen. This does mean that the process would take longer, but the number of rounds should be minimal given that there is likely to be a limited number of bidders in a small country.

The detailed rules within the bidding process (whichever sort is chosen) should aim to minimise the winning price and not maximise it.

10. Administrative pricing seeks to recover the cost of regulation from the regulated enterprises/companies. In applying administrative pricing for the 700 MHz band the Turks and Caicos Islands Commission would need to set the 700 MHz fees as part of the revision of all Spectrum fees. The Commission proposes that the price of the 700 MHz band be set above the price of the 850MHz 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?

It is important here to look at the place of the LTE technology that will use the 700 MHz technology. It will for the time being (many years probably) be an addition to 2G technologies. It will be necessary to run both a 2G network and the LTE network. Therefore costs will rise on the network side. Revenues and profits may, as a result of competition, and in contrast, remain relatively static in real terms. If the total costs of spectrum required are driven higher that would will weaken operators further and/from discourage them from investment.

The rate proposed by the Commission is approximately 30 times the cost in Trinidad and Tobago using the internationally recognised benchmarking practice of looking at cost per MHz per capita. It therefore seems extreme to expect these kinds of fees in the near future in the Turks and Caicos.

We believe that a much better approach (for everyone we emphasise and not just the operators) would be to recognise that total costs of spectrum should not be excessive and that it will take many years to move completely off the GSM spectrum. For example, roaming for voice calls is dependent on the existence of

2G networks currently and will remain so for some time in spite of the arrival of LTE networks. Consequently for the first 10 years the LTE charge per MHz per capita for 700 MHz spectrum could be 5% of the cost of 2G spectrum in year 1, and then increase in 5% increments up to year 10 at which time we believe it may be possible to move off the GSM spectrum. In Year 11 the cost would be 100% of the cost of the GSM spectrum. This would reduce the impact of extra fees initially and therefore encourage investment and allow a reasonable time for transition to the new technologies and encourage companies to get off GSM spectrum if practicable.

	% of 2G cost per MHz per capita				
Years 1 to 5	5	10	15	20	25
Years 6 to 10	30	35	40	45	50
Year 11	100				

11. The Commission proposes to reserve some additional spectrum in the 700MHz band in response to future technology development.

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

Answer: to the extent that it does not conflict with channels 13 and 14 the FCC public safety allocation could be the reserve.

Yours faithfully,

E. Jay Saunders
General Manager
Digicel TCI Limited

P.P.