

DIGICEL (PNG) LIMITED

Submission to NICTA

Public Consultation on Draft Band Plan 2.6 GHz

15 April 2021

***This submission is provided to NICTA for the purpose of the current public inquiry
only and may not be used for any other purpose***

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1 Executive Summary

Digicel welcomes this opportunity to respond to the public consultation on “Draft Band Plan 2.6 GHz” conducted by the National Information & Communications Technology Authority of Papua New Guinea (“NICTA”). As the leading provider of telecommunication services in Papua New Guinea, Digicel welcomes this opportunity to share its global experience around spectrum management and related matters.

As requested, in this submission Digicel provides comprehensive comments and feedback on NICTA’s proposals contained in the Draft Band Plan, which can be summarised as follows:

1. The choice of a combination of band 7 and band 38 is a natural choice which other countries have adopted. However, Digicel believes that mixing TDD and FDD technologies gives rise to co-ordination issues. In fact, the use of band 38 in many countries has not happened despite regulatory aspirations.
2. The presence of the TDD band, band 38, causes interference to band 7. The use of within band 38 guard bands reduces the amount of band 38 spectrum available.
3. High power band 7 base stations can interfere with the band 38 TDD services. Enhanced emission controls giving rise to additional base station costs are required.
4. Band 7 emissions can impact radar and position location services above 2700 MHz. OOB emission controls are required on band 7 to reduce this issue.
5. Multi operator licensing in the combined band introduces inefficiencies in the use of the band and ultimately reduces the system capacities of the band.
6. As an alternative, Digicel believes that an alternative band plan, band 41 will lead to enhanced benefits to operators compared to the planned mixed FDD/TDD plans as:
 - There will be no loss of spectrum to inter-system guard bands;
 - Operators can deal effectively with traffic asymmetry;
 - Average powers are lower in TDD systems, leading to reduced OOB emission issues, and
 - With 194 MHz of TDD spectrum, larger per operator allocations can be accommodated.
7. Digicel believes that NICTA should adopt a needs-based approach to allocating spectrum in Papua New Guinea instead of allocating equal amounts of spectrum to all licensed operators. All spectrum allocations should be fully justified, and a firm use-it-or-lose-it policy should be implemented and enforced.

Further details are provided in the remainder of this document. Digicel would be more than happy to discuss with NICTA anything that is unclear or to further explore any of the ideas.

2 Introduction

Digicel welcomes this opportunity to participate in the public consultation on “Draft Band Plan – 2.6 GHz” and to provide feedback and comments as requested.

3 Background

The draft band plan contains proposals to implement band plans for the 2500 and 2600 MHz bands in Papua New Guinea. These plans are a combination of the 3GPP bands 7 and 38.

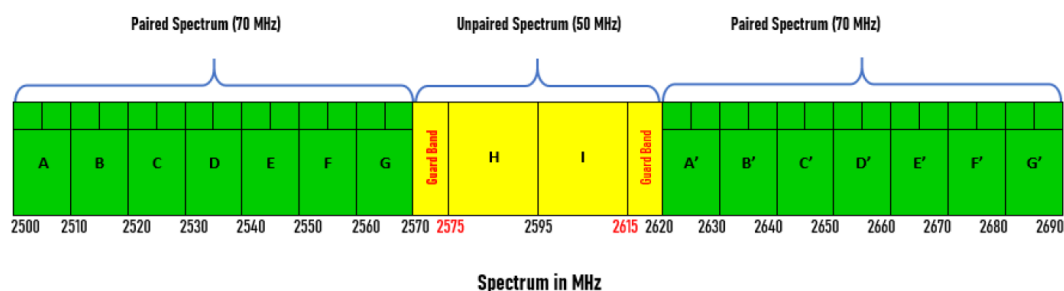
Band 7:

2500-2570 (UL) paired with 2620-2690 MHz (DL). This is an FDD or paired arrangement of 70+70 MHz.

Band 38:

2570 to 2620 MHz. This is a TDD arrangement of 50 MHz in the duplex spacing of band 7.

This arrangement is shown in the Diagram below.



This FDD Duplex spectrum and TDD spectrum will be available for use by mobile operators to implement 4G services as well as 5G services.

4 Comments and Feedback

4.1 Welcome Development

As the previous holder of licensed spectrum in the 2500 and 2600 bands, Digicel welcomes this development to define IMT bands in the former MMDS band. The proposed option 1 of a mix of band 7 and band 38 is one possible option but Digicel believes there are issues with this proposal that will affect the use of the band plans.

4.2 TDD to FDD Interference

This combination leads to interference possibilities at the TDD/FDD interfaces. Indeed, the consultation document recognises this and proposes that any guard band requirements will be accommodated within band 38, reducing it from 50 MHz. This approach unnecessarily sacrifices otherwise excellent mobile network spectrum. Other countries including the UK considered reducing transmission powers in the TDD band to protect the FDD band, but this has in effect resulted in Band 38 being abandoned.

4.3 FDD to TDD Interference

The high-powered base stations downlink signals above 2620 can seriously affect the TDD band. This is recognised by ACMA in Australia where a revised and stringent emission mask has been imposed on the FDD band. This affects the cost and availability of base station equipment such as duplexers. The UK has adopted a similar approach which many suppliers struggled to adopt. These enhanced emission requirements are shown in the Telstra license from Australia which is appended hereto, as is a copy of the Vodafone license in the UK showing the enhanced OOB requirements there.

4.4 Interference to Radar Systems and Positioning Systems Above 2700.

Services in the 2500 and 2600 band can produce OOB emissions that can affect radar services above 2700. This leads to the definition of an enhanced OOB emission requirement to protect these services.

4.5 Effects of Multi-Operator Licensing

If band 7 and probably band 38 are adopted, there will be sublicensing among several operators. This will limit individual allocations and compared to a TDD only service with possibly larger per operator allocations, will support lower system capacities. A non-mixed FDD/TDD band plan will yield the highest possible network capacities, reduce issues with system interfaces and so forth. Operators can set their own service symmetries to maximise traffic flows rather than using FDD spectrum and having underutilised UL system capacities.

4.6 Benefits of an Alternative TDD Only Band Plan

Digicel believes that a TDD only band plan, Band 41 from 2496 to 2690 will be a much better option for Papua New Guinea. This arrangement can commence life as a 4G-only band with easier transitions to 5G services as required. In our view:

- There will be no loss of spectrum to inter-system guard bands;
- Operators can deal effectively with traffic asymmetry;
- Average powers are lower in TDD systems, leading to reduced OOB emission issues, and
- With 194 MHz of TDD spectrum, larger per operator allocations can be accommodated. This ensured the maximum possible spectrum efficiencies in Papua New Guinea.

TDD systems supporting multiple operators require synchronisation and Digicel would be more than happy to discuss providing a common reference synchronisation signal for all Papua New Guinean operators.

4.7 Spectrum Allocation Policies

Traditionally, spectrum has been allocated in Papua New Guinea on an equal basis to each operator, such that bands are split evenly between TPNG/Bmobile and Digicel whilst keeping provision for a third operator. The 900 MHz band started on this basis with 11.6 MHz per operator but is now split evenly between TPNG/Bmobile and Digicel. The 1800 band is similarly divided, as is Band 28 with a provision of 15 + 15 MHz for each of the three operators which are TPNG/Bmobile, Digicel and the new entrant ATH. These allocations have absolutely no correlation with the spectrum requirements of the operators concerned. These allocations are more of a right with some operators underusing their allocations, while others are screaming out for more spectrum to meet the demands in their networks. Some Papua New Guinean operators are not even using the spectrum that has set aside for them, as is the case with the TPNG/Bmobile band 28 allocation. Such has been the stifling predicament for a number of years now.

Papua New Guinea has emerged as a mature network country, with two operators approaching 14 years. It is time that spectrum availability matched the requirements and demands of operators.

There is no place for any sentiment that operators have matched spectrum allocations, irrespective of the network demands.

International reports as well as domestic reports put Digicel's share of the Papua New Guinean mobile market in the low-to-mid 90% figures. So, with 3 million subscribers this means the current competitor in Papua New Guinea to Digicel, viz. TPNG/Bmobile, will be operating with subscriber numbers in the couple of hundred thousand. These disparate subscriber bases simply cannot have the same spectrum demands to meet the requirements of the subscribers, so why should they have the same spectrum allocations?

Once an appropriate 3GPP band structure has been decided for the 2600 MHz band in Papua New Guinea, Digicel urges NICTA to adopt a strict demand basis as the award of any 2600 MHz spectrum.

Appendix 1: Copy of Telstra License showing enhanced OOB requirements in Australia.



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Appendix 2: Enhanced OOB Emission Requirements of Vodafone License in the UK



OFCOM 800M &
2600M.pdf