NAB
National Association of Broadcasters

NAB Written Submission on the reallocation of frequency band 3600MHz to 3800MHz

22 May 2015

1. Introduction

The National Association of Broadcasters (the NAB) wishes to thank the Department of Telecommunications and Postal Services (the DTPS) for affording us the opportunity to submit a formal presentation regarding agenda 1.1 of the WRC15, in particular, the frequency band 3600MHz to 3800MHz (the C-Band). The call for written submissions in relation to this frequency band arose due to the fact that no national position could be reached on the band. This led to the DTPS not tabling the agenda item for discussion at the SADC meeting held in Zimbabwe.

2. Current uses of the C-Band

Before any future C-Band spectrum considerations (eg: for IMT use) can be made, all current spectrum usage should be carefully assessed. The C-Band spectrum (from 3.4 to 4.2GHz) is used extensively by fixed-satellite services ("FSS") and operation of IMT services in this band will potentially cause excessive levels of harmful interference and might preclude future use of this band for satellite services. The C-Band is used extensively by a variety of services, and any re-allocations will therefore potentially impact on these important services, some of which are of national security importance.

3. Africa's usage of the C-Band spectrum

3.1. Wireless Extension Services
3.2. Aviation Security
3.3. Broadcasting (TV & Radio)
3.4. Contribution links into TV/Radio Stations
3.5. Distribution links to terrestrial transmitter sites
3.6. Maritime Communications
3.7. Telemedicine
3.8. Corporate Networks
3.9. Peace Keeping
3.10. Internet Connectivity
3.11. Distance Education
3.12. Disaster Preparedness

4. Importance of C-Band satellite communications

4.1. Worldwide, and in South Africa, the C-Band spectrum is seen as being extremely robust and reliable enough for many applications, such as:

4.1.1. *Data links (V-SAT):*

4.1.1.1. Air Traffic Control

4.1.1.2. Internet access in remote areas (land and sea locations)

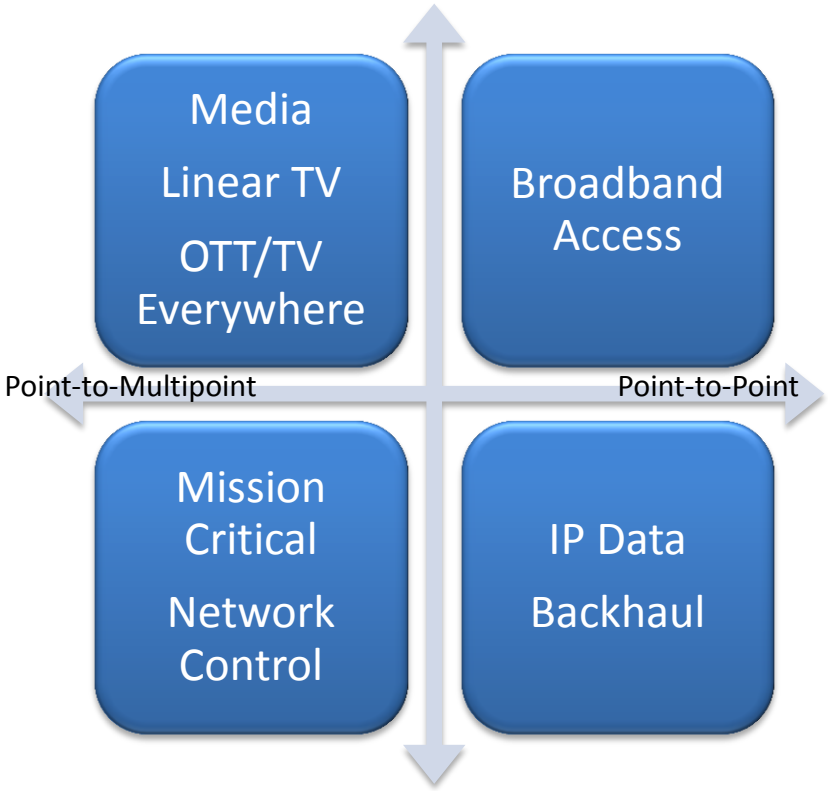
4.1.1.3. Banking point-to-point links

4.1.2. *Emergency services*

4.1.3. Television & Radio Broadcasting links

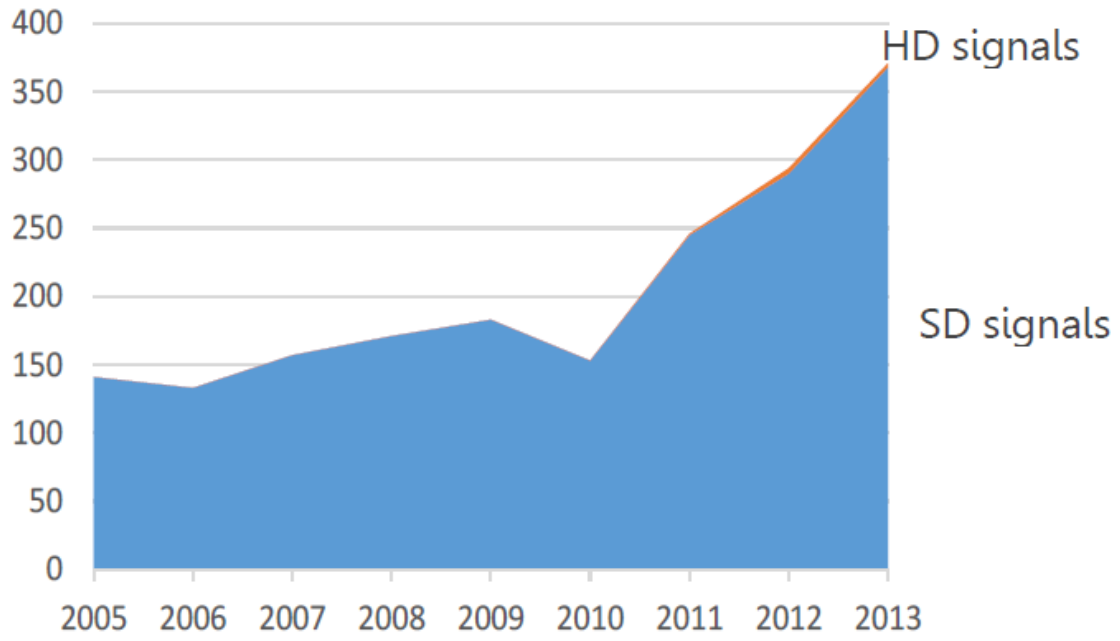
4.2. Furthermore, C-Band satellites are used for both Contribution links (eg: back-haul of content from other parts of the world) and Distribution links (eg: feeders to Terrestrial transmission sites).

5. The C-Band value proposition:



Source: Satellite Broadband Spectrum: Africa's Connectivity Needs & WRC Agenda Item 1.1 [David Hartshorn, Secretary General, GVF]

6. Number of TV signals distributed by C-Band satellites in Sub-Saharan Africa:



Source: Euroconsult analysis of transponder monitoring by Lyngemark Satellite [Lyngby, Denmark] www.lyngsat.com

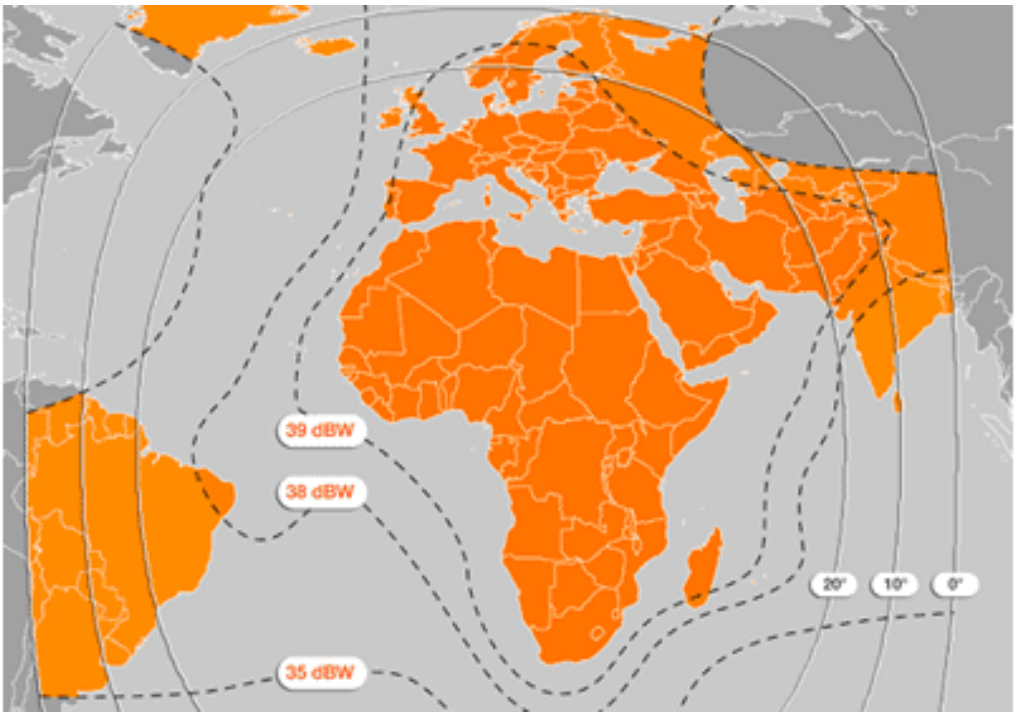
7. C-Band Satellites in Service for Users

The C-Band spectrum represents about $42 to 51 billion of in-orbit (satellite) investment, and this excludes the investments in ground infrastructure. There is substantial ongoing investment in C-band satellite capacity worldwide. At least 52 satellites with C-band payloads have been launched in 2007 to 2012, representing $12 to 15 billion in investments. At least 35 satellites with C-band payloads are under construction and are scheduled to be launched in 2012 to 2015, representing $9-10 billion in investments. Satellites are long-lived assets; typical operational life is 15 years or more. Stable, consistent regulatory environment required throughout.

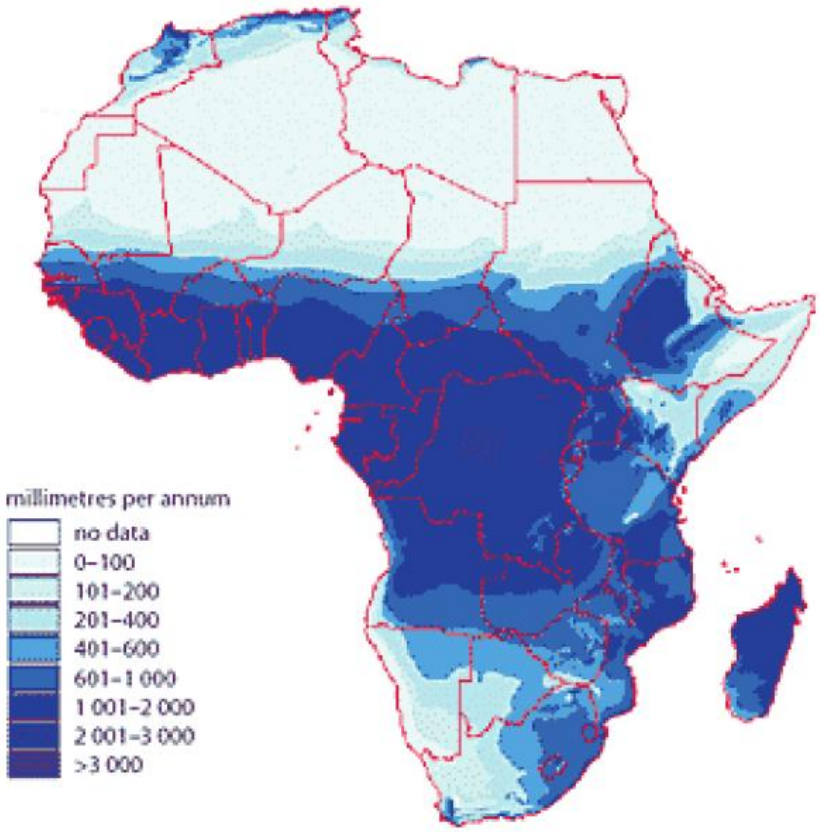
8. Technical Considerations: C-Band vs. Ku-Band (vs. Ka-band):

8.1. The large geographic coverage area of C-band satellite beams allows for whole regions or continents to be connected – resulting in a very cost-effective communications network. For example: Sentech uses a C-Band satellite to deliver all of the SABC TV and Radio stations to all of the Terrestrial transmitter sites spread across South Africa. The C-band range of frequencies is essentially immune to rain fade.

8.2. While services in higher frequencies (for instance Ku-Band) sometimes experience degradation of their signal, services provided in C-band offer extremely high reliability, even during heavy rain. Due to its longstanding good experience with and dependence on C-band, many signal distributers have made a considerable investment into developing an overall network (ground infrastructure, satellite connectivity, and remote equipment) that is heavily reliant upon, and communicates with, C-band satellites.



Typical C-band Coverage



Typical rainfall pattern for Africa

9. Sharing Studies: Interference is a Problem

9.1. Satellite receivers are extremely sensitive devices because they are designed to receive extremely weak signals from satellites located in space 36,000 kilometers above the equator. Many of the newer applications which are seeking to utilize C-band spectrum, such as mobile or nomadic terrestrial wireless systems, emit signals from many locations and in all directions simultaneously. This transmission mode, coupled with the levels of power required for such operations, can easily interfere with satellite receivers.

9.2. In some countries, where regulators have allowed terrestrial wireless services to use C-band, there have been massive interruptions of satellite broadcasting services, affecting hundreds of millions of viewers. Examples where Satellite broadcasting operations have been negatively affected: Bahrain, Bolivia, Tanzania, Hong Kong, the U.S. and many other countries and regions. The interference caused by terrestrial wireless systems is not limited to same band operations. Out-of-band interference received from terrestrial wireless services in adjacent bands is

also a problem; high power signals from wireless systems in an adjacent band are sufficient to make it impossible for sensitive satellite receivers to operate in an adjacent band. Thus, terrestrial mobile deployment in just a part of the C-band would negatively impact satellite services.

9.3. Various ITU technical studies have confirmed that separation distances in the tens and hundreds of kilometers are required to protect satellite receivers from terrestrial mobile services if the latter were allowed to operate in C-band. Such large exclusion zones around every satellite earth station would render any terrestrial mobile service in this band economically unfeasible for wireless system operators.

10. Questionable Need for Additional Spectrum for IMT

10.1. While the NAB does not dispute that mobile data traffic is increasing, mobile operators should be encouraged to consistently improve the network density and efficiency within their existing spectrum. For example: large scale switchover by wireless operators to small cell system architecture would dramatically increase network capacity in wireless systems' existing frequency bands. Technological advancements such as MIMO (multiple-in-multiple-out) can increase network capacity without any increase in spectrum. Additionally, one of the large drivers behind the increase in terrestrial mobile data traffic is video. However, much of the video on mobile devices and tablets is consumed in Wi-Fi-connected areas (the home, the office, the public library or airport).

10.2. These factors, when taken together, would seem to obviate the need for the identification of additional spectrum for wireless systems – contrary to what wireless operators and their supporters claim. Regulators, including ICASA have yet to License IMT usage in the 3.4 to 3.6GHz band, which has already been re-allocated to IMT.

11. Conclusions

The NAB discourages any spectrum re-allocations that will adversely affect existing spectrum users. Satellite spectrum (especially the C-Band range) is an extremely scarce resource, and should be subject to proper planning, design. International Satellite network owners such as Intelsat, Eutelsat, SES World Skies, and many others are appealing to governments worldwide, to preserve the C-Band spectrum for satellite

communications. While the NAB understands government's objectives for the rapid broadband penetration through wireless mobile communication, any unplanned reallocations will adversely affect local satellite network users such as Sentech, Multichoice, Orbicom, Telemedia, GlobeCast.

12. Recommendations

12.1. The NAB proposes that the South African Country position regarding the allocation of 3.6 to 3.8GHz should take into account existing allocations to broadcasting services, consequently existing allocation of Fixed Satellite Systems (FSS) should remain.

12.2. It is evident that the C-Band reception frequencies are used extensively, not only in South Africa, but in other African sites. The NAB therefore proposes that the South African position proposed above, be communicated and advanced at the SADC and ATU level.

12.3. All future requests for other uses of the Fixed C-Band FSS range from 3.6 to 4.2GHz should be accompanied by feasibility studies, providing alternative options such as sharing.

12.4. It is our understanding that the DTPS will evaluate all inputs received in this regard, and have engagements with stakeholders to arrive at a workable South African Position, in preparation for the WRC15. To this end, NAB welcomes the opportunity to make its written submission, and we look forward to further engagements with the DTPS in formulating a workable country position on the C-Band.