

9 December 2016

The Manager
Spectrum Planning Section
Spectrum Infrastructure Branch
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

Dear Sir/Madam

Thank you for the opportunity to comment on the ACMA's consultation paper addressing Future Use of the 1.5 GHz and 3.6 GHz Bands (the Consultation Paper).

Executive Summary

ASTRA's members make use of C-Band spectrum adjacent to the 3.6 GHz band (3.7 to 4.2 GHz band) for the reception of international programming. In general ASTRA supports additional spectrum for MBB to support streaming video services. However, ASTRA's key concern in relation to the Consultation Paper and in particular the potential review of the 3.6 GHz band is that if 5G services are to be considered in 3.6 GHz, existing sharing studies for C-Band spectrum should be revised using 5G parameters to determine both:

1. the potential risk of interference for existing licensed C-band earth stations in the adjacent 3.7 to 4.2 GHz band; and
2. appropriate interference protection measures for existing licensed C-band earth stations in the adjacent 3.7 to 4.2 GHz band, of which ASTRA's members use to receive a broad range of diverse international programming e.g. CNN and Discovery Channels.

ASTRA's related concern is that it does not support relocation of these stations as a matter of principle, including to the extent that the relocation of earth stations is considered as a means of addressing the potential risk of interference between the 3.6 GHz and 3.7 to 4.2 GHz bands. Relocation is extremely expensive and as such would threaten the viability of international programming and services.

Background

As stated above, ASTRA's members make use of C-Band spectrum adjacent to the 3.6 GHz band for the reception of international programming. Specifically, Foxtel uses the 3.7 GHz band to receive programming from overseas (C-Band 3.7 GHz to 4.2 GHz), which ensures a rich diversity of programming is available to Australian customers. Fox Sports also receives a broad range of international sports programming via C-Band downlinks and relies on those links to bring in major and niche sporting events from Europe, Asia and the UK. Accordingly, the industry has made substantial investments in infrastructure and operations based on existing spectrum arrangements (allocations and interference profiles).

Current licensing and protection arrangements make up a crucial part of the service delivery chain for subscription television, a diverse, innovative and highly valued industry that makes

substantial contributions to Australian society. In 2016, one-third of Australians have subscription TV in their homes. The industry employs 8300 people, invests almost \$1 billion in local content annually and generates \$2 billion in value added to the national economy each year.

The services which are available to Australians because of C-Band downlinks include:

- CNN
- BBC World News
- Discovery channels
- Eurosport news
- Animal Planet
- Cartoon network

A complete list of these services is contained in **Appendix A** to this submission.

ASTRA members will continue to make extensive use of C-Band downlink earth stations to receive a broad range of diverse international programming, well into the lifespan for 5G mobile standards.

Our members therefore have a significant interest in any possible changes to spectrum allocations in bands adjacent to its licensed downlinks and we welcome the decision by the ACMA to consult widely on possible changes to the 1.5 GHz and 3.6 GHz bands.

Interference in the adjacent 3.7 to 4.2 GHz band

ASTRA suggests that Appendix B of the Consultation Paper, which deals with current use of the 3.6 GHz band, should also outline current use of adjacent C-Band spectrum (ie, 3.7 to 4.2 GHz), as these services also stand to be impacted by the introduction of 5G services into the 3.6 GHz band. It is important that decision-makers fully understand the potential impacts on business and consumers of any changes in this spectrum.

Due to the extensive use of C-Band downlink earth stations by ASTRA members to receive international programming, it is vital that any changes to arrangements in the bands adjacent to 3.7 GHz to 4.2 GHz (ie, the 3.6 GHz band) do not result in unacceptable interference to existing spectrum users, which could have potentially significant business impacts and could also damage the diversity of audio-visual services available to Australian viewers.

To this end, if 5G services are to be considered in 3.6 GHz, existing sharing studies for C-Band spectrum should be revised using 5G parameters to determine both the potential risk of interference and to determine appropriate interference protection measures for existing licensed C-band earth stations in the adjacent 3.7 to 4.2 GHz band.

On page 41 of the Consultation Paper, the ACMA suggests there are “numerous international studies that can be drawn on to assist with” developing co-existence arrangements between FSS earth stations and MBB systems. Our understanding is that none of these studies used 5G parameters, limiting their utility in assisting in planning for MBB systems. We also note the reference to existing RALIs and Advisory Guidelines. These are a useful starting point, but evidently a new RALI would need to be developed for the specific circumstances outlined in the paper.

ASTRA would also like to highlight that on page 31 of the Consultation Paper, the ACMA notes that the IEEE made an amendment to the 802.11 standard to support operation in the 3650-3700 MHz band within the US. It is relevant to note that this move essentially failed because the geographic restrictions placed on use of the bands, which were instituted to protect C-band earth stations and fixed links, made it unviable.

Relocation of earth stations

ASTRA notes that geographic separation of several kilometres up to tens of kilometres, depending on operating parameters of the MBB service, will be required to protect C-Band earth stations in the adjacent band.

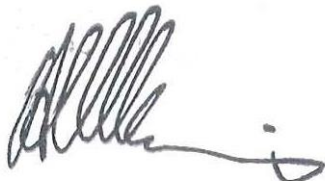
Relocating earth stations as a means of addressing the potential for interference is, as a matter of principle, not supported. ASTRA has consistently opposed the concept of satellite parks. Relocation of the multiple C-band earth stations used by ASTRA members would be a very expensive exercise in both capital and ongoing costs for extended backhaul links. Increased costs would threaten the viability of international programming and services, reducing Australia's access to the international community and diverse sources of news, information and entertainment.

As an additional issue, ASTRA also notes that the 1.5 GHz band falls within the L-band spectrum (1000 MHz to 2050MHz) used for the downlink via the cable from a satellite subscribers dish/LNB to the STB. Existing 4G mobile services in the 1.8 GHz band in close proximity to the customer equipment is known to cause interference either from handset close to STB/cable (<1m) or base station close to the ODU (dish/LNB) (e.g. on the same roof). To minimise the occurrence of this ingress interference Foxtel uses "world's best practise" installation practises, screened cable and connectors. It is likely the same instances of interference will occur with the use of the 1.5GHz band for MBB, however Foxtel considers the occurrence of interference manageable.

ASTRA responds to a number of the specific issues for comment in **Appendix B** to this submission.

If you have any queries or would like to discuss the issues raised in this submission, please contact Holly Brimble, Policy and Regulatory Manager (holly.brimble@astra.org.au).

Yours sincerely

A handwritten signature in black ink, appearing to read 'Andrew Maiden', with a stylized flourish at the end.

Andrew Maiden
CEO

List of services which use C-Band downlinks

IS19

- BBC World News + BBC World Radio
- CNBC
- CNNI
- Discovery Channels
 - Animal Planet
 - Discovery Kids
 - Discovery Science
 - Discovery TLC
 - Discovery Turbo
- ESPN - Emergency feed ex ESPN Bristol for ESPN1
- Eurosport News

AsiaSat 5

- Misc
 - L-band on-pass to Sky News (for APTN/Reuters)

AsiaSat 7

- Turner channels
 - Boomerang
 - Cartoon Network
 - TCM
- Misc
 - L-band on-pass to Sky News (for CNN/other feeds)
 - Fox News - Emergency feed ex Fox Networks Group Asia
 - Sky News UK - Emergency feed ex Fox Networks Group Asia
- *Oxford Falls* downlink of;
 - *Bloomberg - For Emergency use*
 - *Nat Geo People - For Emergency use*

MeaSat 3

- Mezzo Live
- *Oxford Falls* downlink of;
 - *Nat Geo - For Emergency use*
 - *Nat Geo Wild - For Emergency use*

ASTRA Answers to ACMA Issues for comment

1. *Should the 1.5 GHz band and/or the 3.6 GHz band be progressed from the initial investigation stage to the preliminary re-planning stage in the ACMA's process for consideration of additional spectrum for MBB services? Why/Why not?*

ASTRA does not oppose the progression of the 1.5 GHz band to the preliminary re-planning stage. However, the ACMA should consider the following before the 3.6 GHz band can progress.

- a. Existing sharing studies should be revised using 5G parameters to determine interference protection measures for existing licensed C-band earth stations, particularly in the adjacent 3.7 GHz to 4.2 GHz band.
- b. The ACMA should consider a review of the whole of the 3.4 GHz to 3.7 GHz band before embarking on planning for 3.6 GHz band only.

If required, the ACMA can undertake both the sharing study work and the review of the wider band 3.4 to 3.7 GHz as part of the preliminary planning phase, in order to not obstruct the progression of the 3.6GHz band to this stage.

3. *Are there specific issues, other than those mentioned, that may affect the timeframe in which the 1.5 GHz or 3.6 GHz bands could be made available for MBB?*

Refer to answer to question 1 regarding the 3.6GHz band.

16. *The ACMA seeks comment on expected future use of the 3.6 GHz band by fixed, fixed-satellite, amateur and radiolocation services in Australia.*

ASTRA members will continue to make extensive use of C-Band downlink earth stations to receive a broad range of diverse international programming, which is highly valued by Australian viewers.

18. *If the 3.6 GHz band is re-farmed for MBB services, what geographical areas should be considered?*

The ACMA must take into account interference protection of existing licensed C-Band earth stations (both co-frequency and particularly in the adjacent band 3.7 GHz to 4.2 GHz) when considering geographical areas for MBB services in the 3.6 GHz band.

20. *If the 3.6 GHz band is re-farmed for MBB services, and migration of incumbent services is required, are there alternative spectrum or delivery options?*

C-Band will continue to offer a cost effective and reliable means of international program distribution. C-band gives a service provider whole of region coverage (for example, South East Asia) and reliable transmission during rain fade conditions. Ku Band is generally not preferred for international program distribution because of limited regional coverage (for example, Australia only) and susceptibility to rain fade. Fibre distribution offers only point to point delivery whereas C-Band satellite offers point to multipoint. Point to multipoint enables the delivery cost to be amortised over a number of delivery locations, making it a lower cost option than point to point, which is replicated for each delivery location.

21. *In determining whether to re-farm the 3.6 GHz band for MBB, are there any adjacent band issues that should be considered? This includes:*

- a. *the effect such use may have on adjacent band services*

C-Band earth stations operating in the 3.7 GHz to 4.2 GHz band must be considered. There is potential for interference if MBB base stations are in close proximity to earth stations. Interference is generally caused by either out of band emissions, or LNA overload.

- b. *the effect adjacent band services may have on the utility of the 3.6 GHz band for MBB services.*

Geographic separation of several kilometres up to tens of kilometres, depending on operating parameters of the MBB service, will be required to protect C-Band earth stations in the adjacent band. This will limit the areas in which MBB base stations can operate.

22. *If the 3.6 GHz band is re-farmed for MBB services, should the ACMA review arrangements in the broader 3400–3700 MHz band? Why/Why not?*

Yes. The ACMA should consider a review and replanning for the whole 3.4 GHz to 3.7 GHz band before embarking on replanning just the 3.6 GHz band. Replanning this whole band through an early comprehensive review will lead to better outcomes and more efficient spectrum use.

25. *Comment is sought on the ACMA's proposal to progress the 3.6 GHz band to the preliminary re-planning stage of its process for consideration of additional spectrum for MBB services, as detailed in the ACMA's [mobile broadband strategy](#)*

Careful consideration should be given to the interference protection of existing C-Band earth stations. Existing sharing studies should be revised using 5G parameters.

26. *To assist the ACMA in conducting a comprehensive assessment of the highest-value use for the 3.6 GHz band, responses to the following questions are requested:*

e. *Do other options exist for the delivery of fixed, fixed-satellite and amateur incumbent service, how practical are they? What are the costs involved? Will there be a diminution of the service delivered if MBB services are introduced in the band?*

See answer to question 20.

f. *Should further consideration be given to the migration of incumbent 3.6 GHz band FSS earth stations to low density population areas?*

ASTRA does not support the concept of satellite parks. Relocation of the multiple C-band earth stations used by ASTRA members would be a very expensive exercise in both capital and ongoing costs for extended backhaul links. Increased costs would threaten the viability of international programming and services, reducing Australia's access to the international community and diverse sources of news, information and entertainment.