

4 May 2022

The Manager
Major Spectrum Allocations Section
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616
Email: SpectrumAllocations@acma.gov.au

Dear Sir/Madam,

Submission - Proposed spectrum re-allocation declaration for the 3.4 GHz and 3.7 GHz bands

Thank you for the opportunity to comment on the *Consultation paper: Proposed spectrum re-allocation declaration for the 3.4 GHz and 3.7 GHz bands*. We appreciate the engagement being undertaken by the Australian Communications and Media Authority (ACMA) concerning this important issue.

In drafting this submission, we have also had regard to ACMA's *Consultation paper: Apparatus licences in the 3.4-4.0 GHz band in remote Australia (Licensing, allocation process, technical framework and pricing arrangements)* because it includes information directly relevant to the key issue of concern to the aviation industry, being the coexistence of 5G wireless broadband (WBB) with radio altimeters on board aircraft.

By way of background, radio altimeters measure the height of an aircraft above ground level immediately below the aircraft when it is operating at low altitude on approach to an airport's runway. Clearly, it is vitally important that this equipment functions properly and in a manner that ensures the pilot is receiving accurate real-time information concerning the aircraft's altitude, especially at night or in low visibility conditions.

We recognise the need to facilitate the roll-out of 5G globally, and here in Australia, to ensure more efficient network technologies, data capacity and better use of the existing spectrum. We believe it is just as important, however, to ensure these outcomes are achieved in a manner that ensures the safety of aircraft and the 76 million airline passengers who fly annually in Australia. For Sydney Airport, safety is the number one priority.

Sydney Airport is represented on the Radio Altimeter Co-ordination Group (RA-CG), along with the Civil Aviation Safety Authority, Airservices Australia, Department of Defence, NSW Police, Qantas Airways, Virgin Australia, Boeing Australia, Australian Airline Pilots Association, and the Australian Airports Association.

The RA-CG focussed specifically on the aviation safety implications of the proposed spectrum reallocation and provided feedback to ACMA's Technical Liaison Group on 28 January 2022 (see **Attachment A**). The concern particularly relates to the band between 3.7 GHz and 3.98 GHz.

RA-CG members concluded as follows:

The RA-CG strongly supports a method for co-existence that places technical restrictions on WBB deployments, based on the risk it presents to aviation safety. These mitigations need to consider airports and landing locations as well as areas where there is an identified major risk to aviation safety, such as Police and Emergency Services and Defence low level operations.

Sydney Airport continues to support this view.

As ACMA would be aware, this issue is being addressed by other governments around the world. This is particularly relevant given the large number of international airlines flying to and from Australia. Those airlines would be aware of how the issue is being addressed by governments in their home country. Indeed, Sydney Airport is aware of instances where major international airlines have cancelled flights to airports due to the perceived risks presented by 5G interference to radio altimeters.¹ It is obviously important that we avoid such situations here in Australia.

In the United States, the issue has also been considered by the Radio Technical Commission for Aeronautics (RTCA). Incorporated as a not-for-profit corporation, the RTCA was formed to advance the science of aviation and aviation electronic systems for the benefit of the public. In 2019, RTCA formed a Special Committee to understand the potential risks to radio altimeter systems brought about by the interaction with 5G technology.

RTCA's final paper concluded that:

The results presented in this report reveal a major risk that 5G telecommunications systems in the 3.7–3.98 GHz band will cause harmful interference to radar altimeters on all types of civil aircraft—including commercial transport airplanes; business, regional, and general aviation airplanes; and both transport and general aviation helicopters.²

As well as the impact on radio altimeters, other potential aviation-related impacts include:

- The ability of an aircraft to operate in low visibility could be restricted. This could see more aircraft being diverted from Sydney to other airports during periods of heavy fog;
- The ability to introduce RNP (AR) approach operations could be limited or unavailable. These operations, which use best available navigation technology, allow for the more efficient use of an airport's airspace and create the ability to reduce aircraft noise impacts around the airport and reduce fuel burn and aircraft emissions;
- An increase in aircraft landing distance requirements, particularly in wet weather. In Sydney Airport's case, this could mean certain aircraft being unable to land on our shorter parallel north-south runway and instead having to land on our longer main north-south runway. This could cause congestion on the main runway and reduce airport efficiency;
- An aircraft's traffic collision avoidance system (TCAS) may be unavailable. TCAS functions independently of the ground-based air traffic control system and provides collision avoidance protection for a broad spectrum of aircraft types; and

¹ See John Gambrell and David Keonig, January 20, 2022, 'Airlines cancel some flights after reduced 5G rollout in US', Associated Press < <https://apnews.com/article/technology-business-dubai-middle-east-united-arab-emirates-bcac403626879062f8d07080f87e5880> > accessed 29 April 2022.

² The RTCA paper can be downloaded [here](#).

- An aircraft's airborne wind shear warning system, which identifies the presence of potentially hazardous wind shear, may be unavailable.

It is acknowledged that these are *potential* impacts. Some stakeholders have pointed out that, in the absence of absolute proof that these impacts will be seen in practice, there should be few if any restrictions placed on the roll-out of 5G technology in the vicinity of airports. We do not support that view. Rather, given the safety implications of some of these potential impacts, we believe it is appropriate to apply the precautionary principle. The precautionary principle in this case would enable decision-makers to adopt precautionary measures when scientific evidence about a particular hazard is uncertain and the stakes are high. This is why the RA-CG's feedback to ACMA indicated that it:

"...supports the implementation of defensible restrictions at least on an interim basis that are consistent with international direction. As evidence by ACMAs own (incomplete) studies, it is not clear the full extent of the risks and so the initial restrictions should be conservative until more is understood."

Based on international experience, the following interim mitigations could be considered to limit any potential negative impacts on aviation brought about by the re-allocation of the 5G spectrum:

- Establish an exclusion and /or restricted operating area in and around airports. Canada and France have adopted such areas;
- Reduce transmitter power in the vicinity of airports or in the vicinity of airport flight path approaches. France has adopted this measure;
- The angle of 5G tower antennas could be tilted downward to reduce potential interference with aircraft equipment. France has also adopted this measure; and
- More modern radio altimeters could be fitted to existing aircraft.

ACMA identified at least some of these measures in the second of the abovementioned consultation papers (see pp 9 and 10).

We would urge ACMA to consider such measures, even if only on an interim basis, until more precise information is available. We also believe it is important for there to be a whole-of-government approach to addressing these vitally important issues.

If you require any further information, please feel free to contact Sydney Airport's Head of Public Affairs, Mr Joe Dennis, at joe.dennis@syd.com.au or Manager Airspace and Airfield Planning, Mr Ken Allcott, at ken.allcott@syd.com.au.

Yours sincerely



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Review of 3700-4200 MHz, 3.4 GHz bands spectrum and apparatus licence technical frameworks

Comments on the 3400-4000 MHz Technical Liaison Group Paper Version 3.0 dated 21 December 2021

Date: 28 January 2022

Revision 1.0

Prepared on behalf of the RA-CG by: David Cook, Senior Standards Officer, Civil Aviation Safety Authority

1. Purpose

This paper provides combined views of the RA-CG on the Version 3.0 release of the 3400-4000 MHz Technical Liaison Group Paper, dated 21 December 2021.

2. Background

On 21 April 2021, the Radio Altimeter Co-ordination Group (RA-CG), advised ACMA that the RA-CG had formed and provided an initial position paper¹ in preparation and to support the implementation phase, including participation and contribution to the ACMA Technical Liaison Group.

The RA-CG has met on an ad-hoc basis to share and discuss new and emerging information in relation to the potential for WBB services in the 3.7 GHz to 4.0 GHz frequency band to interfere with RA's allocated in the nearby frequency range of 4.2-4.4 GHz. Discussions have included relevant responses from both international civil aviation groups and their regulators.

Members of the RA-CG individually reviewed and considered the information provided in the 3400-4000 MHz Technical Liaison Group Paper;

- Version 1.0, dated 5 July 2021 and provided its feedback in its response paper² on 23 July 2021
- Version 2.0, dated 15 September 2021 and provided its feedback in its response paper³ on 15 October 2021

This paper presents the co-ordinated views of the RA-CG on Technical Liaison Group Paper Version 3.0 dated 21 December 2021.

¹ Position Paper: 3700-4200 MHz band replanning and Radio Altimeter Compatibility, provided by email to Douglas Isles, Senior Spectrum Planning Engineer, ACMA on 21 April 2021

² RA-CG Comments on the 3400-4000 MHz Technical Liaison Group Paper Version 1.0 dated 5 July 2021, provided by email to Douglas Isles, Senior Spectrum Planning Engineer, ACMA on 23 July 2021

³ RA-CG Comments on the 3400-4000 MHz Technical Liaison Group Paper Version 2.0 dated 15 October 2021, provided by email to Douglas Isles, Senior Spectrum Planning Engineer, ACMA on 15 October 2021.

RA-CG has representation from the following;

Civil Aviation Safety Authority

Airservices Australia

Department of Defence

NSW Police

Qantas Airways

Virgin Australia

Boeing Australia

Sydney Airport Corporation Limited

Australian Airline Pilots Associations

Australian Airports Association

3. RA-CG Response to AMCA TLG V3

3.1. RA-CG has focused its response on matters pertaining to *Aviation safety* in particular how ACMA intends to address the feedback given to it by the RA-CG in the 3 other papers and this fourth paper.

3.2. This document is a summary and should be read in conjunction with specific and detail mark-ups and comments on the latest ACMA TLG Discussion Paper V3 and its attachments by individual members of the RA-CG.

3.3. While ACMA advised in its email of 21/12/21 in which it sought feedback on TLG Discussion paper V3, that it only requires "review of our record of TLG member feedback views only, and nothing else", RA-CG requests that ACMA include consideration of recent and significant activity that has occurred in the USA between the regulatory agencies (FAA and FCC), airline operators, avionics, aircraft manufacturers and the major 5G telecommunication providers. The level of concern raised by stakeholders has resulted in significant restrictions on low visibility operations, a delay in the roll-out by the Telcos at certain locations as well as reduced power emissions at other locations. In addition, avionics manufacturers have provided further information on the performance of many RA's used by major airliners that have informed the restrictions. Developments in the USA have a direct correlation with the ACMA's replanning of the near exact radio frequency band i.e. 3.7-3.98/4.0 GHz. This additional information is significant and should be considered by ACMA in its deliberations.

3.4. The RA-CG does not support "Approach A: No additional mitigations above the proposed 200 MHz guard band nationwide." This is on the basis that ACMA and the international aviation community have not completed sufficient analysis to fully understand the risks presented to aviation operations or appropriate mitigations to ensure aviation safety. In particular, ACMA has not considered the additional

information coming from the emerging situation in the US. By not adopting sensible mitigations creates the potential for certain low visibility operations or certain operators to be restricted due to the vicinity or level of emissions from 5G base stations. (Note that the RAD ALT provides input for a variety of functions on the aircraft and not just those associated with low visibility approaches e.g. reverse thrust deployment and tail strike prevention.) This could have significant and detrimental impact on the safety and viability of aviation operations in Australia.

- 3.5. The RA-CG supports the implementation of defensible restrictions at least on an interim basis that are consistent with international direction. As evidenced by ACMA's own (incomplete) studies, it is not clear the full extent of the risks and so the initial restrictions should be conservative until more is understood. It is not clear how the ACMA have developed their proposed mitigations in Approach B nor the safety criteria they have been using to develop appropriate mitigations. Adopting international practice with well-defined short term mitigations will provide certainty and confidence to international aviation operators and the operators of Australian airports that low visibility operations can be completed safely into Australian airports.

4. Summary

- 4.1. Overall, all members of the RA-CG remain concerned about the potential for WBB services to impact on the safety of civil and military aviation operations.

The RA-CG strongly supports a method for co-existence that places technical restrictions on WBB deployments, based on the risk it presents to aviation safety. These mitigations need to consider airports and landing locations as well as areas where there is an identified major risk to aviation safety, such as Police and Emergency Services and Defence low level operations. This can also include operations to oil rigs or other low-level operations.