

This is a redacted version of Speedcast's confidential response submitted on 1 August 2023

Speedcast Australia Pty Ltd's response to the ACMA's Public Consultation paper on "Area-wide apparatus licences in the 3.8 GHz band in metropolitan and regional Australia"

Speedcast Australia Pty Ltd ("Speedcast") would like to thank the ACMA for the opportunity to provide comment to its Public Consultation paper on "Area-wide apparatus licences in the 3.8 GHz band in metropolitan and regional Australia" ("the Public Consultation paper"). Speedcast is a Carrier licensee, and has been operating in Australia for 36 years. Speedcast currently operates three teleports in Australia, two of which, based in Mawson Lakes, Adelaide, and Bayswater, Perth, will be significantly negatively impacted by the changes proposed by the ACMA as detailed in the Public Consultation paper. (Speedcast's third teleport does not operate C-Band, and is therefore not impacted).

Speedcast has been involved throughout the ACMA's process to revise the allocation of C-band spectrum, and has made submissions, conducted meetings and participated in the various forums available, including the Technical Liaison Groups ("TLGs"). We have maintained that the changes proposed are detrimental to pure Fixed Satellite Service (FSS) operators such as Speedcast, as well as the viability and availability of C-band in Australia as a whole.

We would like to offer, from the offset, the opportunity for further dialogue with the ACMA, ACCC and DITRDCA to discuss potential options for the ACMA to achieve the objectives intended for its C-band reallocation, whilst at the same time, preserving C-band for FSS, and thereby preserving the strategic role that this band underpins within Australia and for Australian entities operating across the Australian hemisphere.

We also reiterate the principles that the ACMA has used to guide its decisions, specifically the objects of the Radiocommunications Act 1992 as well as the Ministerial policy statement. We are concerned that there may be unintended consequences from the decisions that are taken in the C-band reallocation that are inconsistent with these guiding principles, and that some technologies will eventually be driven out of this band.

Strategic Impact and the Need for Flexible Satellite C-band Capacity

C-Band capacity delivered via satellite has a far greater binary impact on the business outcomes (or organisational outcomes) for Australian entities operating in remote locations that simply have no other reliable means of delivering even modest telecommunications capacity [REDACTED]

[REDACTED] the strategic impact of their operations in terms of delivering services and building capacity in their area of operations is typically in the region of five or six orders of magnitude larger.

The organisations relying on the unique characteristics of C-Band satellite capacity, and the ability to land that traffic straight back into an Australian capital city, are diverse, ranging from Australian government (both civil and military), Australian mining and oil & gas companies operating in remote Australia, Africa, and Asia, and NGO aid agencies delivering services into our northern neighbours and across the Pacific.

Example 1 : Australian Government Environmental Agency : Speedcast supports the Australian Antarctic Division (AAD)'s operations on the Antarctic continent, plus sub-Antarctic operations (eg: Macquarie Island), as well as delivering services into the AAD's advanced research vessel and icebreaker, RSV Nuyina. Due to the unusually southern latitudes of the Antarctic bases, and the need to cover the movements of Nuyina, only C-Band capacity (via multiple satellites) is feasible, and this is delivered via a combination of our Adelaide and Perth teleports. The ability to land this traffic directly into Australia, rather than into an intermediary country, is an important consideration for these types of services for various sovereignty issues;

[REDACTED]

[REDACTED]

Example 4 : Australian Oil & Gas operators, operating just off-shore and on-shore in the North-West area of Western Australia, with remote operations that simply must have redundant communications that continue to deliver service throughout even the heaviest of rain events (including cyclones). No other satellite technology can deliver the bandwidth they need, and still penetrate heavy rainfall, and these companies have deliberately chosen C-Band, despite the extra equipment cost, as a result of careful engineering study. These operations are at risk of deleterious impacts of any C-Band reallocation by virtue of interference at both the remote site and at the capital city end of the circuit. Note that these companies are very sensitive to any additional latency or any additional in-path dependencies (such as fibre tails), and are very keen to have their private traffic land directly into the nearest capital city [REDACTED]

Example 5 : Aid agencies operating in Papua New Guinea : These aid agencies are an essential part of Australia assisting her neighbours, [REDACTED]
[REDACTED] The tangible health outcomes and educational outcomes that are achieved, and the goodwill that is generated, is difficult to quantify in dollar terms, but is a critical part of Australian regional support. Although the throughput is relatively small in Mbps terms, the positive impact on these communities is immense. These remote operations are in some of the wettest rain zones on the globe, and only C-Band can deliver the reliability of connectivity that these remote operations need in order to support the in-field staff, many of whom are volunteers;

Example 6 : Aid to the Pacific : When the Hunga Tonga–Hunga Ha’apai volcano erupted in January last year, the island nation of Tonga lost all international connectivity. Speedcast immediately mobilised a team that was able to identify available satellite capacity and then activate that capacity from our Adelaide teleport, re-enabling internet connectivity for Tonga via C-Band satellite into Australia; the first restoration of internet connectivity since the sub-sea fibre was destroyed by the eruption^[1]. This is a classic example of how agile our services need to be in order to respond to the strategically important role of supporting and servicing our regional neighbours, and an example of how the reallocation of the 3800-4000MHz band from FSS to an AWL model would significantly impede (or even block) our ability to respond in such a manner.

As can be seen in the examples above, C-Band spectrum used in the FSS role is an important part of Australia’s ability to support operations across the continent and across the entire hemisphere, and a key element of Australia’s support of South Pacific communications.

In light of the strategic importance of this capacity, we ask for special consideration to be given to safeguarding the ongoing supply of flexible C-Band services from Australia, as it would be deleterious for our customers if these services were no longer available, or if we had to teleport them from another country in the Asia-Pacific

region.

Finally, whilst not desirable, but if Speedcast had no other feasible options within the metro and regional areas (details are provided in the following sections), we note that it may be acceptable for some clients and stakeholders if we were to teleport these services from an ESPZ [REDACTED].

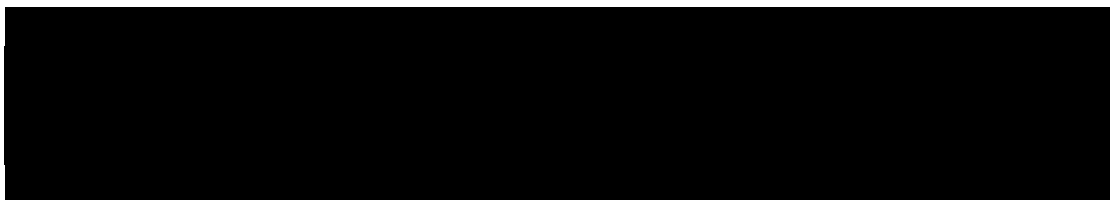
However such a relocation comes with its own challenges. In-country clients are typically sensitive to the increased risk of outage that the long fibre-optic communications route [REDACTED] adds to the service. It would be of strategic benefit to Australia if the Commonwealth were to assist with the implementation of a geographically diverse fibre route from the ESPZ [REDACTED], thus ameliorating the attendant risk. Secondary issues such as the cost of electricity at the ESPZ being [REDACTED] the cost of electricity [REDACTED] are also worthy of consideration, as is the potential additional delay during faults, lack of experienced engineers in close proximity and lack of service personnel to service remote regional areas. Our research indicates that the cost of doing business will generally be significantly higher in an ESPZ.

Technical Framework

Speedcast acknowledges ACMA's efforts to create an environment that is conducive to a variety of technologies. However, we have severe concerns with the proposed changes to this band, including:

- ACMA is opening up this relatively narrow band of spectrum to too large a number of, and incompatible, technology-types and
- The introduction of the AWL into the 3800MHz-3950MHz metro and regional area band, which is not fit-for-purpose and extremely and disproportionately costly for some of the use cases proposed for this band, and in particular FSS.

We strongly recommend that the ACMA maintains the existing Apparatus Licensing approach for FSS, which is generally the acceptable licensing method adopted by most regulators and is considered appropriate for FSS because licensees are charged according to their usage. The AWL is excessive and disproportionate to the needs of FSS and is also more likely to lead to idle capacity due to this incompatibility.



[REDACTED]

In our opinion, AWL will be more suited operationally to WBB terrestrial technologies and operators causing pure FSS operators such as Speedcast to eventually being completely driven out of this band because the AWL is unsuitable - ACMA could be seen to be [REDACTED]

Specifically:

1. Utilising the whole range contiguously is practically impossible as FSS operators operate on a block of frequency range that is provided by the satellite operator based on our actual needs, and some of these frequency blocks are being used to provide services for FSS operators outside of Australia, hence, revamping the whole allocation to make it contiguous just for Australia will be operationally impossible for satellite operators.

Additionally, the satellite operators have a constant requirement to 'regroom' the satellite frequencies, and as such when this is required, additional custom filters need to be procured, new licensing applied for. This is challenging operationally. If we get hit with interference in the slot, we cannot easily transition to a new frequency slot as we do to alleviate the interference.

2. As a consequence, FSS operators will need to apply for a significantly "wider" AWL, or more AWLs, than we actually require in order to practically implement the necessary protection for the non- contiguous bandwidth usage. This ultimately drives up the overall licensing cost for the FSS operator. Additionally, and more of a concern, is that it is also unlikely that the ACMA will grant the FSS operator the AWL(s) due to the limited availability of spectrum within this band and the numerous competing use cases requiring it.
3. Having multiple "small" AWLs is also impractical in the presence of high powered operators such as LA WBB, and most definitely WA WBB, would make interference management operationally challenging, if not impossible. Having to implement the necessary protection for multiple smaller AWLs would be operationally inefficient and too costly, especially bearing in mind the power spectral density differences between signals being received from satellites in geostationary orbit 36,000km away (with the return carrier from remote sites often only being 3dB to 6dB above the system noise floor), versus relatively strong carriers from terrestrial WBB sources only 10's of km away; this is exacerbated during enhanced propagation events such as tropospheric ducting, etc

As such, it is our view that the concept of "area" licensing is inconsistent with FSS receive generally and the ACMA should retain the existing approach of Apparatus

Licensing that is consistent and appropriate for FSS. The “area” approach to licensing ultimately benefits WA WBB, LA WBB or operators that have multiple use cases for this band (whereby they provide mobile services and FSS and can mix and match usage of the AWL to fully utilise this licence type in a manner that maximises local profitability, with no regard to the regional external costs).

The ACMA’s proposed framework does not provide acceptable alternatives for FSS

According to the proposals by ACMA, FSS operators currently operating in this band may consider relocating to the >4000 MHz band or to move to rural areas of Australia or to an ESPZ.

Speedcast has considered each and they all leave FSS in a worse off position, with the former not even being a feasible option for Speedcast.

Moving to >4000 MHz Metro

If ACMA were to maintain its position for the 3800-3950MHz band and given the operational difficulties and the cost of AWLs Speedcast could consider trying to move as many C-Band services as possible to allocations in the area 4000-4200MHz, whilst maintaining operations from our existing teleports in the metro areas of Perth and Adelaide.

Two technical issues with this however, are:

1. Firstly, the physical configuration of several satellites [REDACTED] is such that the high-performance hemi-beams and gateway beams that can be utilised for in-region coverage or cross-strapped for servicing Africa or the Middle East (for example) only transmit towards Australia at frequencies below 4000MHz; this has been the case since their construction and launch. Removing the ability to receive 3800-4000MHz in the Perth or Adelaide metro areas is not an inconvenience, but rather it completely negates the ability to use this strategically important capacity altogether. These satellites do have transponders that transmit on the relatively weak Global Beams, from 4000-4200MHz, and we can continue to use those, but the performance for the remote sites when forced to use Global Beams is typically 7dB weaker, delivering approximately 80% less Mbps per MHz than was experienced in the same capacity on the Hemi Beams, and, with the signal being spread across the entire globe, is inherently less secure from eavesdropping or interference (deliberate or accidental) than a shaped beam.
2. Secondly, there is very little satellite capacity available in the 4000-4200 MHz sub-band, being a result of the reduced frequency re-use opportunities that

Global Beams offer, plus the relative shortage of capacity on regional satellites [REDACTED] as customers and service providers have migrated up from the 3600-3800MHz sub-band that has already been reallocated to 5G cellular use across most of the globe.

As such, whilst conceptually appealing, the option of moving customer services to a higher frequency (ie: from 3800-4000MHz to 4000-4200MHz) is not actually feasible for a significant portion of services for FSS operators such as Speedcast, unless the ACMA takes deliberate measures to add new capacity above 4GHz in the region, in the manner that the FCC in the USA, or the ACMA provides sufficient lead time (at least two years) and delays the implementation of the AWLs to enable FSS to work with satellite providers to implement a major regrooming exercise.

Relocation to an ESPZ or remote Australia

With the incompatibility of the AWLs with FSS and the immediate unavailability of spectrum above 4000 MHz, FSS operators currently in the 3800-3950 MHz metro/surrounding areas band are likely to find ourselves having to relocate to an ESPZ or remote Australia, should ACMA persist with the implementation of the AWLs.

This results in stranded assets, potentially losing talent as employees may not have the flexibility to move and significant relocation and start up costs, in the form of new antennas, data centre and systems that need to be built in these teleports. All of this requires a huge sum of investment.

Relocation from our established teleports will undoubtedly require a transition period and we anticipate our operations to be unstable and unreliable due to periods of interference where Speedcast is unable to move carrier relocation causing SLA breaches and penalties. Our customers are typically large enterprises and government agencies that require a high SLA. We also foresee a continued difficulty to meet client SLAs due to the inherent travel time for our staff and contractors.

Speedcast anticipates that a move to an ESPZ would cost [REDACTED] in capex, for antennas, amplifiers, satellite hub equipment and routing equipment, and be subject to increased operational costs such as electricity being circa [REDACTED] the cost per kWh than [REDACTED], plus the increased costs of having engineers and technicians service the equipment via a [REDACTED] round-trip from [REDACTED].

General concerns with the proposals in the Technical Framework

As aforementioned, Speedcast is of the view that the concept of AWLs/ AWL Rx for pure FSS operators is incompatible and the conditions proposed for the 3800-3950MHz band for Metro and surrounding areas would result in pure FSS operators with teleport facilities to be driven out of this band in the longer term. We are strongly opposed to AWLs and recommend that the ACMA maintains the existing Apparatus Licensing for FSS.

In this section, we provide comments on the technical parameters proposed by the ACMA, highlighting our concerns as to why the AWL is operationally unworkable and too costly for FSS **AND** WA WBB should not be allowed into this band.

Filter requirements

General filters in the market work within a contiguous bandwidth. Based on our assessment of the filter requirements, Speedcast would require a customised and fairly complex filter solutions.

We foresee the following challenges:

Lead time for custom filters

For operators such as Speedcast that are using some spectrum above 4000 MHz and potentially using some below 3950MHz, a custom filter will be required. The process of manufacturing a custom filter is complex and time consuming and typically would comprise a detailed assessment of the spectrum allocated and the customer needs, R&D, and then manufacturing at the relevant factory. Custom filters would usually be [REDACTED] and taking into consideration shipping time, installation and then testing, we would expect at least a 6-month duration from when the licence is awarded, assuming there are no delays in the process.

This lengthy period of time could severely impact Speedcast's service continuity to our customers and we are extremely concerned that there is **currently no indication of how ACMA intends for operators with existing licences in this band to be transitioned to the new band without severe disruption to service delivery.**

Cost

Aside from the significantly higher licence fees that FSS operators will have to incur under the new regime, custom filters are expected to be a significant additional cost that FSS would need to incur as a result of this regulatory change.

Currently, every retuning for Speedcast typically requires a CAPEX [REDACTED] per unit for off the shelf. A custom tuning will be **significantly more expensive**. We anticipate we will require custom filters for all our antennas and for every regrooming from then on - Speedcast currently has [REDACTED] antennas. If ACMA were to force the AWLs onto FSS that remain in this band, we believe that affected licensees should be compensated for all additional costs.

Tenure and renewal

Speedcast notes the ACMA's current thinking of a licence period of up to 6 years, until 13 December 2030, with the option for licensees to take up shorter licence periods.

We also note that the recommendation that renewal statements will be excluded from the licence and that renewal will be at ACMA's discretion. Speedcast is generally very concerned about this approach as it does not provide operational certainty, and the 6 month notice proposed is insufficient to move operations/ relocate to new premises.

Again, Speedcast's position is for the current conditions for Apparatus Licensing to be carried forward and certainly the current recommendations does not appear to consider that FSS's typical bandwidth requirements that will vary depending on customer requirements. That is the reason that the apparatus assignments taken are typically for a short term period, usually annually, to enable FSS to ramp up and down as often as needed to bring on new capacity into the network.

Being given a 6 month notice that our licence may not be renewed, especially with contracts that span at least a year with customers, would not work.

We therefore recommend that the ACMA allows annual (apparatus) licences for FSS, and grants renewals, unless specific, explicitly stated renewal criteria have not been met. In the event that notice for non-renewal is to be provided, **at least 2 years notice should be given to the licensee.**

Allocation process

The licences in the band being considered should be administratively allocated, rather than auctioned, to ensure a fair and balanced allocation. For FSS operators, Speedcast maintains that the most appropriate licence should be Apparatus Licences - these too should be administratively allocated.

Speedcast also strongly opposes WA WBB being allocated any capacity within this band due to incompatibility with other use cases.

Speedcast is concerned that ACMA has not indicated the manner in which it intends to prioritise allocation amongst use cases. We recommend that existing technologies in this band be given priority to remain in this band, under the appropriate licence type for them. As such FSS (under Apparatus Licences), PTP and PMP should be prioritised over any new incoming technology type such as LA WBB, and an appropriate amount of time, i.e. at least 2 years, be provided to enable transition over to the new arrangements. This is necessary to ensure continuity in service and so that end users are not inadvertently negatively affected by the regulatory change.

Pricing

As detailed out in the previous sections, Speedcast is of the view that an area-based licence is unsuitable for a FSS operator.

The current Apparatus License works best for FSS operators as they are currently paying for frequencies that are actually being used. Under the AWL regime, operators will have to apply/purchase for a minimum frequency block in their operating area but this block will inevitably be bigger than what they actually require. For example, a satellite service of 5MHz will have to apply for a quantum of either 50/60/70 MHz under AWL, which is very cost inefficient and penalises FSS unfairly.

Coupled with the costs needed to manage the additional interference, we do not envisage operating in this band under an AWL being operationally viable for FSS. We are concerned that the ACMA could be [REDACTED] by introducing a licence type (i.e. the AWL) and a licence fee that is better suited for some operators versus others.

Summary and conclusions

Speedcast is concerned that the ACMA's proposed approach to regulate the 3800-3950 MHz metro and surrounding region band is incompatible with, and

disproportionately too costly. This could result in forcing these operators to eventually vacate this band - we cannot see C-band FSS being viable in this band in the longer term.

This issue, coupled with the fact that the option of moving customer services to a higher frequency (ie, from 3800-4000MHz to 4000-4200MHz) not being feasible for a significant portion of services for FSS operators such as Speedcast, could lead to longer term unintended consequences for C-band satellite availability and therefore to Australia as a whole. C-Band spectrum used by FSS is a very important part of Australia's ability to support operations across the continent and indeed across the entire hemisphere and Australia's ability to properly facilitate critical communications across the South Pacific.

We strongly encourage the ACMA, ACCC and DITRDCA to take a step back and truly consider the nature of the FSS technology and its needs before implementing changes to the regulatory environment that could ultimately drive out this technology (forcing us to move out of Australia to other countries). Specifically:

- **We recommend retaining FSS in this band under the Apparatus Licences and giving priority to FSS in the allocation of spectrum; and**
- **We strongly oppose WA WBB being given access to this band as doing so would make operating in this band operationally unviable for other technologies.**

Speedcast has a long history in Australia and Australia continues to be a country of strategic importance to us. We would therefore like to work with ACMA, ACCA and DITRDCA on a way forward that will enable all parties to achieve our strategic objectives

For any questions regarding this submission, please contact:

[Redacted contact information]

→ Madory, D. "Update on Tonga", 21st January 2022, ONLINE at <https://twitter.com/DougMadory/status/1484215403119353857>