



Aqura Technologies Response to ACMA Options Paper

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

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Table 1: Revision History

DISTRIBUTION LIST

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Table 2: Distribution List

REFERENCE DOCUMENTS

This document is intended to be read in conjunction with the following

Reference Documents	
Document Number	Description
ACMA	Proposed spectrum re-allocation declaration for the 3.4 GHz and 3.7 GHz bands

Table 3: Reference Documents

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Introduction

Aqura is a specialist in the design, delivery, operation, and support of Private LTE networks across Australia. Anecdotal feedback indicates that Aqura has either been responsible for, or involved in, or supports the significant majority of Private 4G LTE deployments that are in operation across Australia. We have a solid grounding in the delivery of 4G and are now delivering one of the first Private 5G enabled networks in Australia. Our networks are found across Australia and serviced by in-house specialists in offices across the country.

Aqura represents broader enterprise and has extensive experience, and awareness of the importance of the licensing regime covering the operation of LTE networks in all regions of Australia.

With the proposed changes outlined in the ACMA Options paper this submission is made under, we strongly advocate for controlled access to appropriate spectrum for Private 5G LTE usage for Industry 4.0 use cases. Private 4G networks have added great value to businesses in Australia where spectrum is available.

Aqura respects the significant investment of carriers to acquire spectrum and equipment to provide a valuable service to a broad consumer base, which must be considered when planning spectrum availability.

Additionally, those holding spectrum for competitive gain (spectrum squatters) are restricting the ability of end-user organisations to create and operate their own Private networks and the opportunities this can provide.

Spectrum Access a Critical Driver of Future Opportunity

At a broader macro-economic level, the ACMA led the way with issuing spectrum to enterprise users to enable the roll out of private 4G networks in remote Australia which has been used as a template for success globally. We would like ACMA to continue enabling private enterprise to adopt the latest technologies, like 5G, which will enable Australia to be more competitive, productive, sustainable and efficient in the global economy.

Urban Excise

The ACMA's preferred planning approach: urban excise spectrum

Do you have comments on our preferred approach to:

- > issue spectrum licences in the 3400–3475 MHz frequency range in urban excise areas in accordance with Option A?
- > allocate spectrum in the 3800–4000 MHz band for LA WBB use using the segmentation approach?

Aqura does not support the ACMA's preferred approach with option A. The lack of spectrum available for apparatus licencing below 3800MHz currently excludes 4G as a technology option in metropolitan areas. Option B is supported by Aqura as it enables a greater deployment of network solutions which require critical communications paths leveraging dedicated wireless networks.

While 5G Core and RAN may be readily available today, the industrial 5G user endpoint ecosystem is still immature and will take a number of years to develop. It will only be then that cost-effective and

suitably diverse ranges of industrial 5G-enabled devices will be available to leverage Private 5G networks.

Once suitable spectrum becomes available, acceleration of Private Networks would be immediate with users being able to adopt 4G, then upgrading to 5G in line with 3GPP roadmap. Availability of 4G spectrum would greatly accelerate immediate adoption of private mission-critical wireless networks.

Restricted cell apparatus licence access to 3400-3475MHz would allow choice of 4G or 5G RAN and also reduce risk with any potential private network deployment in and around airports and helipads due to potential radio altimeter compatibility issues.

Aqura acknowledges the utility of re-allocating excise area spectrum to spectrum licencing and as an alternative, propose that an additional 50MHz between 3750MHz and 3800MHz be allocated to AWL / apparatus licensing in the metro area and the urban excise spectrum becomes spectrum licensed. This would allow a modest level of spectrum to be available for 4G in high-demand metropolitan areas and provide a wider access area than the excise area. Aqura propose that this 50MHz be used for small/ restricted cell apparatus license dependant on area of use.

Aqura's view is that in high demand areas, small/restricted cells will form most licence requests. The segmented approach is supported but reviews should be conducted to confirm boundaries and use cases. The Aqura alternate proposed 3750 - 3800MHz and 3950 – 4000MHz band could be segmented for restricted cell and 3800-3950MHz for macro cells.

Aqura support the use of site-based apparatus licencing for the restricted cell bands.

Planning Approach

The ACMA's preferred planning approach: 3400–3575 MHz and 3700–3800 MHz

Do you have comments on our preferred planning option (Option 3), which updates the previous preliminary planning decisions (Option 1)?

Please provide evidence in support of your comments. See also the 'Specified parts of the spectrum' section of this paper.

Aqura supports, in principle, option 3 as this provides for a defragmented band and less restricted use of spectrum, 15MHz compared to option 1 and 2 with 45MHz. This provides for a more efficient use of spectrum compared to options 1 and 2 and most benefit for carriers and end users. Option 3 also aligns with worldwide band use and allocations.

For regional area 1, Aqura have a concern that the 250MHz of spectrum allocated between 3750 and 4000MHz may be insufficient to meet demands of industry and carriers, particularly the eastern areas of Queensland and NSW. Aqura propose that another 50MHz between 3700 and 3750MHz be made available as AWL / apparatus licensing. An advantage of this allocation is that existing licence holders in this 50MHz would not have to move.

Aqura request that consideration be given to an additional 50MHz be allocated for apparatus licensing in metropolitan areas to enable choice of 4G or 5G deployments in the 3750 – 3800MHz band. This ability is lost if the urban excise area of this segment is re-allocated as spectrum licensing only. Critically apparatus licensees could better leverage this 50MHz segment in and around airports and helipads to minimise interference with radio altimeters. A high proportion of potential industrial network deployments would be found in areas adjacent to or in the flight corridors of Australian airports.

A critical driver to allow the choice of 4G in the 3750 – 3800MHz band is the availability of end-points. The 5G endpoint ecosystem is currently immature and would not enable many industrial users to construct sustainable use cases to stand up a dedicated Private 5G network. A more sustainable strategy would be to deploy as Private 4G, which has a healthy endpoint ecosystem, and upgrade to 5G in line with 3GPP as the device ecosystem matures. This approach would provide investment confidence and see far quicker rollout of Private 4G and 5G-enabled networks.

The Aqura 5G Underground initiative currently in deployment with support under the Federal Government 5G Innovation Initiative has found the 5G endpoint environment highly limited with many partners leveraging devices which are still in development. Without funding support, the 5G project would not have been possible given the dearth of industrial 5G devices currently available in market.

License Type

1.1.1 The ACMA's proposal: licence type

If the ACMA makes a re-allocation declaration, do you have comments on our proposal to issue spectrum licences in the 3.4 GHz (including in regional areas and in urban excise areas) and 3.7 GHz bands?

Please provide evidence in support of your comments.

Aqura generally support the use of spectrum licencing between 3400 – 3700MHz in regional area as this provides a de-fragmented band and benefit most users.

Aqura supports the ACMA option B approach for the urban excise area as this allows the use of apparatus licencing and restricted cell use in the band which allows greater technology choice and operation of private networks in and around airports. To support the conversion of the urban excise band to spectrum licencing, Aqura have requested that consideration be given for an additional 50MHz between 3750MHz – 3800MHz be made available for apparatus licenced restricted cell use in the metropolitan areas.

Planning

1.1.2 The ACMA's proposal: parts of the spectrum

If the ACMA makes a re-allocation declaration, do you have comments on our proposal to declare for re-allocation the parts of the spectrum in accordance with our proposed planning option (Option 3, 'Planning options', above)?

We welcome stakeholder views on the parts of the spectrum proposed for re-allocation, particularly the inclusion of the frequency ranges 3475–3492.5 MHz, 3492.5–3510 MHz and 3510–3542.5 MHz in specified geographic areas as described under Option 3 in 'Planning options'.

Aqura generally supports option 3 and the proposed re-allocation between 3400 – 3700MHz and the conversion to spectrum licencing.

For regional area 1, particularly eastern Queensland and NSW, Aqura propose that the 50MHz between 3700 and 3750MHz be made available as AWL / apparatus licencing to meet the expected high demand from industry and service providers. Experience has shown that access to spectrum in this area for industry use cases has not been possible due to spectrum squatters restricting access or competition from a high-number of users where demand exceeds available spectrum to operate their business efficiently.

In the metro area, Aqura propose that 50 MHz be made available for spectrum licencing from 3700 – 3750MHz and 50MHz be made available for apparatus licencing between 3750 and 3800MHz so that the option of 4G or 5G equipment can be leveraged for Industry adoption.

Time frames

The ACMA's proposal: reallocation period and deadline

If the ACMA makes a re-allocation declaration, do you have comments on our proposal for a re-allocation period of 5 years from the commencement of the reallocation declaration, and a reallocation deadline of 12 months before the end of the re-allocation period?

Please provide evidence in support of your comments.

Aqura believe that a 5-year re-allocation period is adequate and as noted, persons interested in the encumbered spectrum can negotiate shorter periods.

The 12-month re-allocation deadline is reasonable.

Other Matters

The ACMA's view: licence term and commencement

We seek stakeholder views on the appropriate spectrum licence duration.

Our preliminary view is that licences should commence shortly after an auction.

Aqura have no comment.

The ACMA's preferred view: lot configuration (frequency)

If the 3.4 GHz band in regional areas is re-allocated, our preliminary view is to divide the spectrum into 10 MHz lots, with one or more leftover lots of 2.5 MHz, 5 MHz or 7.5 MHz, depending on the region. Alternatively, we may consider 5 MHz lots with 7.5 MHz leftover lots.

If the 3.4 GHz band in urban excise areas is re-allocated, our preliminary view is to divide the spectrum into 10 MHz lots, with a leftover lot of 15 MHz at 3460–3475 MHz.

If the 3.7 GHz band is re-allocated, our preliminary view is to divide the spectrum into 10 MHz lots.

We invite comments from stakeholders on bandwidth configuration options.

Aqura agree with the ACMA's approach using 10MHz lot size.

The ACMA's view: lot configuration (geography)

We welcome submissions from stakeholders on the most appropriate geographic area configuration for the spectrum.

Aqura have no comments on this section.

The ACMA's preferred view: allocation methodology

Do you have comments on the proposal to use the 2-stage generic lots clock auction format for this allocation?

Please provide evidence in support of your comments.

Aqura have no comments on this section.

The ACMA's preferred view: minimum spectrum requirement

Do you have comments on our preliminary view to offer bidders at auction an MSR of 2 lots, particularly if the 2-stage clock auction with generic lots is used?

Please provide evidence in support of your comments.

Aqura support the MSR of 2 lots as this provides a useable channel size. Anything smaller than MSR of 2 lots does not provide enough viable throughput for general use cases.