



World Without Wires Pty Ltd
Response to Future approach to the 3.6 GHz band
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Introduction

World Without Wires Pty Ltd was established in 2004 with the sole focus to provide high quality broadband services to underserved communities, since then we have built an extensive privately owned and funded fixed wireless network covering over 18,000 square kilometres.

Our customers range from Residential Home services to Small, Medium and Large enterprises, we service all sectors of the economy including, Agriculture, Mining, Industrial and education.

This is primarily achieved using the latest in fixed wireless broadband technology, we are incredibly active in the research and development of new products, with extensive engagement with vendors.

We continually evaluate and deploy new technologies faster than larger competitors and have motivation to ensure high quality regionally focused services are provided to niche markets, often unserved by large carriers.

Over the last 13 years we have seen significant changes in the telecommunications landscape, this has primarily been driven by consumer demand in reaction to a rapidly evolving media and communications industries.

The demand for connectivity continues to increase from all segments of the market, those in metropolitan areas have historically been quite well served, and this is due to the density of population which translates directly to profitability through economies of scale.

Large operators and consumers tend to fair quite well in these markets, being both profitable and highly competitive, high speeds at low prices are typical.

However in regional areas the economics are vastly different, the cost to service each customer in regional markets make certain areas unviable for investment by Tier 1 carriers.

This is further reinforced by federal Governments black spot initiatives and the National Broadband Network's (NBN) Satellite and Wireless division's profitability or lack thereof.

There is a common misconception that the demand for regional broadband access will be satisfied by the NBN, this is false, there are a number of inescapable technological and economic factors the NBN is unable to avoid and as a result will be unable to deliver on its promise of ubiquitous access for all.

The Australian Communications and Media Authority (ACMA) has taken the step to introduce a proposal to re-farm the 3.6Ghz spectrum in Australia, including Metropolitan and Regional areas, citing the same justification for both.

The way the ACMA has framed the debate shows lack of understanding of the differences between fixed and mobile broadband services or their vital and differing functions in a metropolitan and regional context.

Further justification for reframing is the potential future use of this spectrum by "Dense, wide-area network providers" to roll out the fifth generation of services or 5G, this approach shows a lack of understanding of the Long Term Evolution (LTE) of the 3GPP standards.

A better understanding of what 5G may become would certainly be helpful, especially when developing policy, below is a brief explanation of the evolving standards.

According to the Institute of Electrical and Electronics Engineers (IEEE) the five Key areas of development for 5G are:

- Millimetre Waves : Between 30 – 300 GHz
- Small Cell : Higher density of transmitters
- Massive MIMO : Advanced multipath propagation
- Beam forming : directional signal transmission
- Full Duplex : Simultaneous use of spectrum

A helpful animation can be found here: https://youtu.be/GEx_d0SjvS0
(Everything You Need to Know About 5G – Published By IEEE Spectrum)

Small Cell technology is of particular importance, it will be used to vastly increase available capacity in areas of high density and fill in coverage gaps and black spots.

Black spots are areas which do not have existing coverage by any existing provider, they are simply due to lack of infrastructure capable of servicing the area.

When a “Dense, wide-area network provider” deploys infrastructure, this comes at a substantial cost, there must be a reasonable expectation of a return on the investment or it will not be made.

The reality is there are large parts of Australia where it is not financially viable for a large provider to build infrastructure, this is obviously well recognised and evident by the implementation of Mobile Black Spot Program.

“The Australian Government has committed \$220 million to the Mobile Black Spot Program to invest in telecommunications infrastructure to improve mobile coverage along major regional transport routes, in small communities and in locations prone to natural disasters.”

As a direct result of the existing spectrum licencing regime in Australia it is not possible for small carriers to access spectrum suitable for providing mobile phone coverage.

Wireless Internet Service Providers (WISP) specialise in providing broadband services to underserved communities, currently using long range fixed point to multi-point wireless, in some cases the very same 4G (LTE) technology used for mobility.

If the ACMA were to adopt a more flexible licencing regime like that of the Federal Communications Commission (FCC) in the United States, there would be a market opportunity for small scale carriers or “Neutral Hosts” to provide fixed and mobile wireless services in areas uneconomical for large carriers.

For an overview of what a neutral host is see: <https://youtu.be/wU5X6refJMk>

Since 2012 the FCC has been working on the Citizens Broadband Radio Service (CBRS) which is a Dynamic Spectrum License Management (DSLIM) system, this will actively facilitate a tiered and dynamic approach to spectrum management.

A DSLIM system will allow micro management of the band, allow smaller carriers access to spectrum so they can provide services in underserved areas, and promote healthy competition through the entry of neutral host providers into the market, WISP’s are best placed to fill this gap.

Issues for comment

1. Should the 3.6 GHz band be progressed from the preliminary replanning stage to the re-farming stage in the ACMA's process for considering additional spectrum for MBB services? Why/Why not?

No, the current approach by the ACMA would lead to reduced services in regional areas, and favours larger "Dense, wide-area network providers", at the expense of existing small operators delivering services to customers today.

They make the false assumption that the overall economic value is best serviced by theoretical services in the future rather than actual services being delivered today.

The notion that spectrum demand exceeds supply in regional areas is false, there are great swaths of spectrum owned by operators that are disused in many regional areas, this action can only be seen as predatory and designed to reduce competition not promote access.

By the ACMA's own admission it is likely that incumbent providers will be evicted from the 3.6GHz band and nothing will be put in its place for extended and undetermined periods, "it may not be necessary or possible to have extensive geographic coverage from day one".

This initiative by the ACMA seems to be a clear case of bowing to external pressure from large customers showing "Strong interest in deploying dense, wide-area networks".

Larger providers show "interest" in deploying network, this is enough justification to remove existing users from the band.

"Second, technical efficiency can be improved by an operator intending wide-area coverage having access to common spectrum in all areas", this is a false assertion.

T-Mobile in the United States has recently purchased 1525 separate 10-megahertz licenses in the 600MHz band, and is planning to roll out network in 414 separate areas.

<https://ecfsapi.fcc.gov/file/10805121056796/T-Mobile%20Ex%20Parte%2008.04.17%20FINAL.pdf>

T-Mobiles Vice President of Investor Relations Nils Paellmann said : "We can basically use our roll out of the 600 with LTE to also lay the foundation of future 5G. A lot of the radios...will be upgradable, through a software upgrade, to 5G."

Again evidence that the ACMA is woefully uneducated and is not in a position to be making policy changes of this magnitude.

2. Do the areas identified in this analysis cover the likely areas of high demand for access to the 3.6 GHz band? Would smaller or larger areas be more appropriate? Why?

No, we disagree with the current analysis, if the ACMA is committed to change then this should only occur in the metropolitan areas which have been under embargo since 2008.

3. If any part of the 3.6 GHz band is re-allocated for the issue of spectrum licences is seven years a suitable re-allocation period? If not, what period of time would be appropriate?

No, seven years is not an appropriate time to recoup investments already made by incumbents in this band, Telstra recently stated they would recommend a ten year re-allocation period in the event it attained the spectrum allocation, this situation illustrates how out of touch the ACMA is with the

operational realities of the telecommunications industry, when a commercial competitor would allocate more time for re-allocation than a supposed un-bias government department.

4. Should different re-allocation periods be considered for different areas? For example, should a longer period be considered for services outside Area 1?

Yes, in the event that the ACMA was to proceed with a nationwide spectrum license, then it seems logical to extend the period of time for re-allocation for those most affected.

Regions outside Area 1 should have a minimum of ten years to vacate the band, and more importantly have another band available for relocation.

5. Are these guidelines appropriate? Why?

No, these guidelines are incorrect, the ACMA assumes that the mathematical models of \$/Hz/Population are only sound when there is an assumption of market dominance, that a specific carrier or winner of an auction process would be entitled to recoup their “investment” from the entire population.

For example the population of a certain area is 50,000 residents, this method of evaluation makes the false assumption that a provider with a license will be entitled to a certain percentage of that population as customers, as if the decision making capacity of the people has been removed and the market is there for the Government to carve up and sell off to the highest bidder.

This is a clear admission that the ACMA’s current spectrum license regime is selling market share to the highest bidder by keeping other competitors out as opposed to enabling an environment where the shared public resources can be used most efficiently to deliver actual services to the community.

The only way to break the cycle of market dominance by a select few tier 1 carriers “Dense, wide-area network providers”, is to open the available spectrum up to smaller providers through a Dynamic Spectrum License Management (DSLIM) system.

6. Are there any other issues that affect the usability of an area-wide licence that should be taken into account when defining the licence area?

The concept of a wide area license should at most only be applied to high density metropolitan areas, either maintenance of the existing apparatus license or implementation of a Dynamic Spectrum License Management (DSLIM) system is preferable.

7. If point-to-point licences are affected by replanning activities in the 3.6 GHz band, are the options identified for point-to-point licences suitable? Are there any alternative options that should be considered?

Yes, there are many bands available using the existing apparatus licencing regime, hence any forced migration would be far easier for point to point users than point to multi-point.

8. Is the 5.6 GHz band a viable option for wireless broadband systems?

No, for the following reasons:

- **Too widely used** – Although it is not legal to use this spectrum the reality is that there exists an extraordinary amount of equipment capable of using this band in use in Australia, the band is already as congested as the ISM bands above and below.

- **High Policing Costs** – In the event that the 5.6GHz band were to be Apparatus licensed, the ACMA could anticipate extraordinary costs in policing this band for the reasons mentioned above.
- **Reduces Bandwidth** – The proposal that somehow 40Mhz is a viable substitute for 125MHz is preposterous, it's almost three times less spectrum which is heavily illegally used. This is a pathetic attempt to “Throw the WISP’s a bone” in the hope they will stop raising objections.
- **Inadequate protection from radars** – the EIRP is extreme from radars, it is simply not feasible to use this spectrum in the same way as the existing 3.6GHz is currently.

9. Under what circumstances should apparatus- and class-licensed arrangements be considered for the 5.6 GHz band?

The only circumstances where the 5.6GHz band should be considered is when the issues mentioned above in question 8 have been addressed.

10. If apparatus licensing arrangements are developed for wireless broadband systems in the 5.6 GHz band, are the notional arrangements proposed in Appendix 3 suitable?

The 5.6 GHz band is an unrealistic option, any discussion of specific allocations arrangements are useless.

11. If point-to-multipoint licences are affected by replanning activities in the 3.6 GHz band, are the alternative options identified suitable? Are there any alternative options that should be considered?

The ACMA seems to have quite flexible terms when describing specific technology types, the initial discussion paper referred to Mobile Broadband (MBB) as :

“the term ‘mobile broadband’ is used to refer to a variety of different technologies and terms such as 3G, 4G, 5G and long term evolution (LTE). The term should also be taken to equally refer to fixed broadband systems. “

If by point-to-multi point licenses, the ACMA is referring to incumbent WISP’s, then unfortunately there are no alternative point to multi-point licensed bands available to incumbent operators, if the ACMA was genuinely trying to find an alternative for incumbent users of the 3.6GHz spectrum, serious consideration must be given apparatus licencing of the following bands:

- 2400 – 2500 MHz
- 4000 – 4200 MHz
- 4940 – 4990 MHz
- 5091 – 5150 MHz
- 6000 – 6100 MHz

The above have been flagged due to the availability of commodity hardware, adequate bandwidth and protection from illegal use.

12. The ACMA seeks comment on the suitability of the current west coast earth station protection zone located near Mingenew, WA, for long-term satellite service use. Are the current regulatory arrangements effective?

No Comment

13. In the event FSS earth stations are affected by replanning activities in the 3.6 GHz band, the ACMA seeks comment on:

a. Any issues surrounding the development and establishment of an east coast earth station protection zone; particularly on what factors would be necessary to make it an attractive option for earth station operations.

No Comment

b. Whether there are any views on potential candidate locations to consider.

No Comment

c. Whether there should there be more than one earth station protection zone on the east and west coasts of Australia.

No Comment

d. If the identification of a central Australia earth station zone should be considered.

No Comment

14. Are the approaches for amateurs, radiolocation services, class licensed devices and TVRO systems suitable?

No Comment

15. Are there any other options for incumbent services, not identified in this paper, which should be considered?

No Comment

16. Should any of the sharing arrangements discussed in this section be considered for implementation in the 3.6 GHz band? Why or why not?

Yes, Dynamic Spectrum License Management is quickly becoming an internationally adopted model, and is the best way to accommodate incumbent users in the band as well as provide access to new entrants including tier 1 carriers.

17. Are there any other sharing arrangements that should be considered?

Since 2012 the FCC has been working on the Citizens Broadband Radio Service (CBRS) which is a Dynamic Spectrum License Management (DSL) system, this will actively facilitate a tiered and dynamic approach to spectrum management.

<https://www.fcc.gov/rulemaking/12-354>

18. Are there any other replanning options that should be considered?

Maintaining the existing apparatus licencing regime in areas 2 and above, and implementing a spectrum license or preferably apparatus license regime in area 1.

19. Which replanning option should be implemented in the band? Why?

In order of preference:

Option #	Order of Preference	Why
2(a)	1 – Strongly Agree	Preserves the existing market currently being served, and additionally allows smaller operators to compete in a metropolitan setting.
2(b)	2 - Agree	This would go a long way towards preserving existing users and provide somewhat less chance for metropolitan competition, as area-wide licenses may attract a higher and unattainable price point for smaller operators.
1	3 – Agree	If a suitable arrangement with incumbents cannot be reached the best alternative is to do nothing.
4(a)	4 - Neutral	If the ACMA insists on changes, this option goes some way to accommodate incumbent users on a more long term basis, while allowing their continued existence and expansion.
4(b)	5 – Neutral	If the ACMA insists on changes, this option goes some way to accommodate incumbent users on a more long term basis, but only allows for continued existence without further expansion.
3(a) 3(b)	6 – Disagree	This would have a severe and negative effect on some incumbent users of the band, we would not support this option.
3(c)	7 - Disagree	Existing operators would be forced to remain stagnant or shutdown, this would be favouring larger operators at the expense of smaller.
3(d)	8 - Strongly Disagree	All existing operators would be forced to shut down without suitable alternatives, this would be a matter for the ACCC.

20. In the event an area-wide licensing option is implemented, in which of the defined areas (that is, Area 1, 2, 3 and Australia-wide as defined in Appendix 6) should these arrangements be implemented? Are the current area definitions appropriate? If not, what area should be defined?

If wide area licencing option is implemented, this should only be done in Area 1.

This would somewhat mitigate the negative effects of the re-planning on incumbent users.

21. If Option 4a is implemented, what frequencies and areas should be re-allocated for the issue of spectrum licences? How much spectrum should remain subject to site-based apparatus licensing arrangements? Should different amounts be considered in different areas?

A minimum of 40MHz should be made available for apparatus licensing in all areas, including metropolitan, this will facilitate competition by small operators in high density areas and the continued existence of Wireless ISP's in a regional setting.

22. If Option 4b is implemented, what frequencies and areas (that is, incumbent apparatus licence services) should remain subject to site-based apparatus licensing arrangements?

All existing apparatus licenses should be preserved in their current form, with allowances to increase the density of the deployment without increasing the geographic area occupied, allow incumbents

to attain additional licenses and reuse spectrum where possible, allowing for market expansion without geographic expansion.

23. *Comment is sought on the ACMA's preferred option (Option 3c) for the 3.6 GHz band.*

We strongly disagree with the ACMA's assessment of Highest Value Use (HVU) and as a result option 3c is the least preferred option.

In the event the ACMA were to proceed with Option 3c it will have lasting economic and social damage on regional areas, there will be many thousands of real users that will be left with extremely poor substitutes or no options.

The single user licencing model is simply lazy and illustrates the ACMA's lack of foresight for emerging technologies (5G) and its willingness to bow to the pressure of "wide-area network providers".

"In identifying this preferred option, the ACMA has given thought to the possibility of using some form of ongoing spectrum-sharing in the band (including the use of dynamic spectrum access approaches)."

If the ACMA accepts the merit of a dynamic Spectrum approach, why not for the 3.6 Ghz band with a tired access.

"The ACMA has carefully considered whether practical sharing models could be implemented within the existing legislative framework, which would meet the requirements of both aspirant wide-area broadband network users and incumbent (and aspirant) point-to-multipoint users alike. Its view is that in areas where demand for 3.6 GHz spectrum is likely to exceed supply, practical sharing models will not provide the required certainty of long-term access to wide-area broadband users while simultaneously offering the desired certainty to current and new point-to-multipoint users that they state is required."

The statement above illustrates the ACMA's willingness to favour the aspirant wishes of "wide-area broadband network users" at the expense of the incumbents.

This wreaks of undue influence from lobbyists, and a willingness by the ACMA to accommodate the wishes of its larger customers.