Planning options in the upper 6 GHz band

Background

The digital divide is a pervasive and persistent problem that affects millions of households. Solving this quickly and cost-effectively requires the use of advanced broadband technologies.

Fiber is one choice, but its long deployment timeframes and at times, high costs mean it is not universally applicable to every scenario. This is particularly true when rapid deployment is required/desired.

Wireless broadband, specifically fixed-wireless access, is complementary to fiber deployments and offers a radically different approach in terms of cost efficiency and deployment time.

One objection that is sometimes raised against FWA is the perceived impact of interference on performance and reliability in unlicensed spectrum leading to lower capacity. However, recent technology advances embodied in next generation fixed wireless access (ngFWA) solutions, such as the ones developed by Tarana Wireless, are changing what is possible in FWA, and in particular in unlicensed spectrum.

The broadband FWA solution has been ignored in Australia for the 6 GHz band although this solution would provide the most gain to the most people quickly.

Different regulators have regulated unlicensed spectrum operations differently. In the United States and Canada, the regulators adopted a progressive set of regulations, designed to stimulate the deployment of reliable broadband services in unlicensed bands. The recent opening of much more license-exempt spectrum in the 6GHz band for outdoor “standard power” operation. In the United States, the standard power outdoor operation is allowed in 5925 MHz-6425 MHz and 6525 MHz-6875 MHz for a total of 850 MHz. Canada allows a total of 950 MHz of spectrum for a standard power outdoor operation in 5925 MHz-6875 MHz. This allows for larger channel bandwidths (160 MHz and even 320 MHz) and the EIRP limits for “standard power” are very similar to the ones in UNII-3: 36 dBmi. As a result, a healthy ecosystem of 3000+ wireless ISPs (WISPs), most of them utilizing unlicensed spectrum, has been created, serving many millions of customers in the US and Canada.

It is clear that the license-exempt spectrum in the 6 GHz band for outdoor standard power operation is crucial for providing wireless connectivity in many different types of products that Australian consumers could use. In doing so, the new innovative technologies could readily make broadband connectivity available for all Australian communities including the underserved and rural communities.

What are your views on the 4 broad planning options identified for the upper 6 GHz band?

- Option 1: Maintain existing arrangements, with potential reconsideration at a later date.
- Option 2: Introduce arrangements to enable RLAN access to some or all of the upper 6 GHz band, via a variation to the LIPD Class Licence. There would be no arrangements introduced for WA WBB.
- Option 3: Introduce arrangements to enable WA WBB access to some or all of the upper 6 GHz band, under apparatus and/or spectrum licensing. There would be no arrangements introduced for RLANs.
- Option 4: Introduce arrangements to enable both RLAN and WA WBB access to different frequency segments within the upper 6 GHz band, using the respective authorisation arrangements in options 2 and 3.

There is a high demand for wireless broadband and the demand will continue to grow. We support option 4 which enables both RLAN and WA WBB. The vast majority of data traffic is handled on fixed networks such as the broadband FWA so enabling the RLAN option in the upper 6 GHz band is necessary. The remaining demand is handled on the mobile networks so the WA WBB option is a good complementary option in this band. It makes the most sense to introduce arrangements enabling both RLAN and WA WBB to meet the ever-growing demands for wireless broadband, provide the most options, and solve the digital divide.

If we decide to divide the band into different RLAN and WA WBB segments, should the WA WBB segment: a.) be a multiple of 100 MHz? b. align with the 160/320 MHz wi-fi channel raster?

We recommend aligning the upper 6 GHz band with the wi-fi channel raster over the 100 MHz IMT channel raster. The wi-fi channel raster that makes the most sense is to allow 40 MHz channel in a flexible arrangement and not limit the channel raster to either 160 MHz or 320 MHz rater. The flexible arrangement of 40 MHz channel raster maximizes the number of available channels which leads to an efficient usage of the upper 6 GHz band.

Of the segmentation options based on wi-fi channels, what is the preferred option and why?

The preferred segmentation option based on wi-fi channels is to allow a total of 16 x 40 MHz channels in both contiguous and non-contiguous multicarrier arrangements for Broadband Fixed Wireless. Again, the flexible arrangement of the channel raster is essential for the efficient usage of the upper 6 GHz band.

Is it appropriate to limit our consideration of hybrid options for accommodating multiple services to frequency segmentation only? For example, should geographic segmentation or less traditional sharing models be considered when determining models for enabling access to the upper 6 GHz band by both WA WBB and RLAN services?

It is not appropriate for ACMA to limit the hybrid options of accommodating the RLAN and WA WBB to frequency segmentation only. We support the combination of frequency, geographic (using the Apparatus license), and non-traditional (database-assisted coordination-AFC) segmentations so that Australian consumers can take advantage of the upper 6 GHz band quickly.

The database-assisted coordination such as AFC allows the outdoor Standard Power operation while protecting the incumbent services from interferences. That way, both the unlicensed and licensed operations can share the upper 6 GHz band and this coordination method needs to be implemented to allow Standard Power which is required to provide a reliable high-speed broadband and maximize the usage of the band.

It takes time to establish the database-assisted coordination system and operators and such a system is necessary before the Standard Power can be operated in the high-population urbanized areas. While the database-assisted coordination system is being established in Australia, we suggest implementing geographic segmentation using the Apparatus license in regional/remote areas. Many of the rural and underserved communities in Australia do not currently have a reliable high-speed broadband option. Using the geographic segmentation to allow the Standard Power operation in the upper 6 GHz band enables the rural and underserved communities to immediately benefit from having reliable broadband.

Conclusion

We want to emphasize how essential the “standard power” operation is to enable Broadband Fixed Wireless Access in the upper 6 GHz band and we are looking forward to the 6 GHz standard power class band opening in Australia as one of the leading countries in the world. We recommend an alignment with FCC rules so that many devices that are already available in the US market could readily be deployed in Australia to bridge the digital divide gap.