free tv
AUSTRALIA

Submission by Free TV Australia

Five-year spectrum outlook 2022-2027

Australian Communications and Media Authority

April 2022

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2. Executive Summary

- Free TV welcomes the opportunity to provide a submission to the Australian Communications and Media Authority (ACMA) on the draft Five-Year Spectrum Outlook for 2022-2027. Our members are spectrum users in a number of different bands discussed in the FYSO consultation draft.

Re-planning of broadcaster UHF spectrum

- Since publication of the draft Five-year Spectrum Outlook, the government has convened a Future of Broadcasting Working Group and the department has circulated for comment two proposed programs of work:
    - Proposed workstreams; and
    - Supporting research initiatives.
- We expect the ACMA will take into account the final program of work, including agreed workstreams and research initiatives, when it finalises the Five-year Spectrum Outlook 2022-2027.
- We also strongly encourage the ACMA to take the lead on any issues where it is best-placed to do so.
- An example where ACMA leadership would be appropriate is the challenge of accommodating wireless mics and other class-licensed services in the event of a 600 MHz 'second digital dividend'.
- We welcome the ACMA's acknowledgement of the need to transition class-licensed services out of TV UHF spectrum in any 'second digital dividend' scenario. However, we think work should begin sooner on the question of where these services might go, including the availability and suitability of alternative bands.
- Reallocation of 600 MHz would reduce the amount of UHF spectrum available for wireless mics and also potentially increase 'noise'. Alternative spectrum available in 1800 MHz has poorer propagation characteristics, ruling it out for some use cases. Solutions adopted overseas may be unavailable here as those bands are in use for other services. Finding a satisfactory path forward for class-licensed UHF services will be a precondition for any 600 MHz 'second digital dividend'.
- The ACMA should also take primary carriage of the issue of potential interference to television, and any mitigation options, resulting from adjacent wireless broadband services in the 600 MHz band. The 'reverse duplex' arrangement internationally proposed for 600 MHz, by placing mobile base stations in the spectrum immediately adjacent to TV, looks set to create more serious issues for TV reception than we saw following the 700 MHz 'digital dividend' exercise.
- The cost and practicality of mitigating any 'noisy neighbours' problem in 600 MHz will be relevant to determining the overall cost of any 600 MHz reallocation process. Free TV calls on ACMA to prioritise its preliminary work on adjacent band interference and mitigation issues so as to inform deliberations of the Future of Broadcasting Working Group on the cost of reallocation of 600 MHz spectrum.
- Turning to the proposals in the draft Five-year Spectrum Outlook, we welcome the ACMA's renewed focus on research work supporting the Future of Broadcasting Working Group, though were disappointed to learn of some of this research through an AusTender process.
- Whenever research directly concerns issues, such as householder TV reception arrangements, where the TV industry has expertise, there would be clear value in ACMA discussing its research goals and methodology as early as possible with TV industry experts. This should be seen as getting the most from the research dollar, rather than as a stakeholder management issue.

Continuing pressure on TOB spectrum

- Television outside broadcasting (TOB) spectrum remains essential for real-time TV coverage of events and breaking news.
- While TOB is not a primary focus of ACMA's proposed 2022-27 work program, several initiatives will require TV industry engagement to ensure licences in use for TVOB are not devalued or degraded. They include:
    - Impending updates to RALI FX3 in connection with 7.2 GHz spectrum;
    - Revision of spectrum licence technical frameworks, including the 2.6 GHz 'mid-band gap' spectrum licences critical for TVOB; and
    - Any work flowing from the ongoing 'monitoring' status of 13 GHz or the 'initial investigation' status of 2300-2302MHz.
- Not mentioned in the Draft FYSO is the ongoing work associated with space industry requests for coordinated access to 2 GHz spectrum licensed for TOB. This has become very time-consuming for both TV broadcasters and Free TV, which provides a single point of coordination for licence applicants.
- The TV industry remains committed to work with ACMA and other spectrum users to maximise the utility of spectrum for all users, on terms which do not degrade or devalue TV's TOB licences.
- We invite ACMA to consider ways we can between us discourage the most time-consuming and vexatious of space industry requests while perhaps offering a simpler and quicker path for space industry participants who do the right thing, including operating in locations isolated from heavy TOB use and accepting any consequences of secondary status where clashes would otherwise arise.

3. Introduction

Free TV Australia is the peak industry body for Australia's commercial free-to-air broadcasters. We advance the interests of our members in national policy debates, position the industry for the future in technology and innovation and highlight the important contribution commercial free-to-air television makes to Australia's culture and economy.

Free TV proudly represents all of Australia's commercial free-to-air television broadcasters in metropolitan, regional and remote licence areas.

Our members are dedicated to supporting and advancing the important contribution commercial free-to-air television makes to Australia's culture and economy. Australia's commercial free-to-air broadcasters create jobs, provide trusted local news, tell Australian stories, give Australians a voice and nurture Australian talent.

A 2020 report by Deloitte Access Economics "*Everybody Gets It: The economic and social benefits of commercial television in Australia*" highlighted that in 2019, the commercial TV industry supported 16,300 full-time equivalent jobs and contributed a total of $2.3 billion into the local economy. Further, advertising on commercial TV provided an additional $4.4 billion worth of economic benefit.

In addition to this economic analysis, Deloitte also undertook a consumer survey that highlighted the ongoing importance of the commercial TV sector to the community, including finding that:

- 86% of people consider that commercial television supports Australian culture
- 76% of people consider commercial TV is more important than ever
- 95% believe that losing it would have an impact on society.

The commercial free-to-air broadcasting industry creates these benefits by delivering content across a wide range of genres. These include news and current affairs, sport, entertainment, lifestyle and Australian drama.

Television broadcasters in Australia are the main users (with radio) of the frequency range 174-230 MHz and (with wireless microphones and other class-licensed devices) of 520-694MHz. In addition, television broadcasting uses radiofrequency spectrum beyond what is immediately apparent to the public. While the television transmissions to antennas on residential premises are clearly the primary application there are a wide range of other uses such as:

- Terrestrial feeder links for contribution of television program material from other sources
- Terrestrial feeder links as relays from television centres to outlying transmitters
- Wireless cameras used in electronic news gathering
- Sports and special event program content from outdoor venues
- Wireless microphones for sound recording
- Contribution of television program material from overseas sources via satellite
- Satellite distribution of TV via VAST

- Two-way radiocommunications.

Accordingly Free TV takes a direct interest in the following additional spectrum bands:

- 2 GHz (1980–2010 MHz and 2170–2200 MHz);
- 2.6 GHz (2500 - 2690MHz)
- 7 GHz (7025 – 7125MHz and 7100-7425 MHz)
- Satellite Ku (11.7 – 12.7GHz)
- 13 GHz (12.75 – 13.25GHz)

4. Broadcasting Services Band – 600 MHz monitoring

4.1 Background

While 600 MHz is proposed to remain at the lowest ('monitoring') stage of the ACMA's band re-planning work program, this would seem to be meaningless as policy responsibility for the future configuration and use of 600 MHz has simply shifted from the ACMA to the Minister. The practical reality is that both ACMA and the TV industry will be heavily engaged over the life of the present Draft FYSO in work that will help determine the future of free-to-air TV in Australia.

In light of this reality, Free TV welcomes the government's recent decisions to convene the Future of Broadcasting Working Group and to allocate funding to the associated TV Research Work Program. We look forward to working closely with the government and the ACMA as we consider the future evolution of TV distribution, including any spectrum implications. We are also hopeful ACMA will accord appropriately high priority to any additional work that arises out of the Working Group's investigations.

As we explain in the Executive Summary, the ACMA should take primary carriage of two pieces of work identified in the Kordia Report, *Broadcasting Spectrum Consolidation 2021.* These are the issues canvassed at 4.2.2 and 4.2.3, below, namely:

- Sharing issues: TV and IMT in 600 MHz (the 'noisy neighbours problem'); and
- Class licence users in the 600 MHz band.

As the cost of mitigating any adjacent channel interference to TV resulting from wireless broadband in 600 MHz will be part of the overall cost of any future re-allocation of 600 MHz spectrum, the ACMA should start looking at the issue early enough to inform the Future of Television Working Group process, which is expected to finish in 2023.

We note that ACMA has obtained an additional $2.19m over the next 18 months for its component of the TV Research Work Program. This will include 'complementary technical research to support possible future work on television channel replanning and licensing'. The draft FYSO identifies four broad areas for research, as follows.

  - Investigating television receiver performance capabilities, including operating under Single Frequency Networks (SFN) scenarios, and the ability of receivers to cope with shared multiplexing. This work will help inform consideration of potential consumer impacts under different planning scenarios, and coverage and interference modelling in possible subsequent channel planning. (A request for tender for this work was recently published on AusTender.)

- Investigating new processes and tools for channel planning to assist with the restack channel planning under multiplex sharing arrangements.
- Exploring possible parameters and solutions for channel planning relevant to possible new shared multiplex arrangements. This work will provide evidence to inform the restack channel planning framework and planning principles in the future, once the restack objectives have been set by the government.
- Undertaking preliminary work on the licensing options under potential new arrangements with shared multiplexing and assessment of requirements for template amendments to television licence area plans (TLAPs). We will also consider the operational procedures for varying the TLAPs.

On 14 March, we note that a tender in relation to the first component of this work appeared on AusTender.

4.2 TV Research Work Program

4.2.1 Earlier engagement with TV broadcasters on relevant research

While appreciative of the priority government and the ACMA have accorded the Future of TV work, we were very disappointed to find out about the ACMA antenna survey through AusTender. TV broadcasters have deep knowledge and extensive practical experience of terrestrial reception arrangements. Government, ACMA and the TV industry have worked constructively together in the past to better quantify and remediate domestic reception problems, notably in relation to the Hunter region. Depending on the focus of ACMA's current proposed enquiries, TV network engineers will have well-informed views relevant to the methodology and focus of any field survey going forward.

Early consultation with the TV industry about research directly relevant to its own areas of expertise should not be seen as a stakeholder management exercise, but as an opportunity to test the questions to be asked, and the methodologies for answering them, on other industry experts, ensuring a bigger 'bang' for the research buck.

4.2.2 Sharing issues – TV and IMT in 600 MHz (the 'noisy neighbours problem')

With only the high-level information available to date on the scope of ACMA technical research to support the Future of Broadcasting Working Group process, we remain concerned that we do not know enough about the potential risks to TV reception arising from the 'reverse duplex' configuration of the FCC 600 MHz band plan. Issues of particular concern to broadcasters include that filter-based solutions for TV antennas affected by 'noisy neighbours' moving into the 600 MHz band may be so expensive as to be impractical, or injurious to reception due to signal attenuation.

The potential for interference to TV receivers and signal boosters from both in-band and out-of-band emissions from mobile telecommunications is a well-known issue from the first digital dividend, when 4G mobile services commenced in the neighbouring 700 MHz band. However, an early program of work is needed to understand the extent to which the "reverse duplex" nature of 5G network architecture will worsen these problems and complicate the task of mitigating them.

In the case of 700 MHz, carriers use the lower part of the band (nearest to the broadcasting services bands) for low-power and usually transitory transmissions from mobile devices back to a base station. These signals rarely disrupt household TV viewing. The mobile base stations themselves are potentially much larger sources of interfering signals. However, as they use the upper part of the band –

separated from TV by over 50 MHz – any interference problem is usually readily fixed by fitting an inexpensive filter at an appropriate place in the viewer's antenna system and cabling.

A reverse duplex poses two challenges that should be further assessed by the ACMA in good time before government and industry make final decisions about repurposing 600MHz. The first is that many more households will experience interference from the much stronger signals coming from (elevated) 5G base stations, typically whenever a new base station is in the field of view of the household antenna. A sub-set of these households will face intractable interference, meaning they will need to obtain television from another source.

The second is that in order to be effective, any filter fitted to shield TV reception will need to be far more expensive, and potentially bulkier, than the simple filters used for 700 MHz carrier interference problems. The expense arises because filters vary in complexity depending on how 'steeply' they cut off reception of the unwanted signal. In the 700 MHz band, filters can be gently sloped, right across the 50 MHz separating TV from 4G base stations. By contrast, a 600 MHz filter, assuming the reverse duplex arrangement, would need to be far 'steeper' (and hence more expensive), since the unwanted signals might begin only 7 MHz away from the TV signals. Whether 7MHz is sufficient separation will also be an issue for the out-of-band emission and protection rules developed for this band in Australia, which will need to take appropriate account of the reverse duplex problem.

The ACMA's future work program should include an investigation to scope out both the problem and the options for mitigation, prior to any 600 MHz reallocation. Specifically, work is needed to understand what kinds of filter products, and at what prices, industry can supply. We also recommend work to estimate the number of affected households.

4.2.3 Class licence users in the 600 MHz band

Free TV is pleased to see that the need to transition class licence users out of broadcaster UHF spectrum, an issue missing from the Media Reform Green Paper, has now been picked up in the FYSO commentary on 600 MHz.

In addition to developing a transition plan, serious thought should be given sooner rather than later to the question of where these services would be transitioned to. Any re-farming of 600 MHz and re-tuning of TV into 500 MHz may result in less and/or noisier 'white space' spectrum suitable for low interference device operation. Especially in highly congested areas, such as the Gold Coast, this may affect the feasibility of using UHF 'white space' at all, or the operating range (and therefore the utility) of wireless mics.

While there are other bands already available for wireless mics, notably 1785-1800 MHz, inferior propagation of 1800 MHz spectrum makes it unsuitable as a direct replacement for some UHF equipment.

Further, Free TV has been advised that much of the current equipment will lack the re-tuning capability to move into any remaining available spectrum, so would need to be replaced. This is particularly problematic given many users have only recently refreshed their equipment following the 700 MHz re-farming process.

5. Television Outside Broadcasting – multiple bands

5.1 Background

The TV industry employs significant amounts of mid- and high-band spectrum for television outside broadcasting (TOB). Some of this spectrum is in demand for other uses or is adjacent to other bands that feature in the ACMA's forward work program.

Spectrum for TOB is critical to live coverage of breaking news and major sports. It supports the wireless cameras needed for free-to-air coverage of major sports, as we have most recently seen during the Australian Open. It allows TV to create temporary communication channels over long distances, crucial for bringing real-time images of major breaking news stories to national audiences, however remote the location. While the mix of uses of TOB is changing, our members expect TOB technology, using sufficient dedicated spectrum, to remain indispensable to their operations for the foreseeable future.

5.2 Pressures on TOB spectrum

Free TV acknowledges the sensitivity ACMA's spectrum experts have generally shown to TOB use cases in their approaches to sharing and adjacent-band issues to date. We continue to work proactively with the regulator, new market entrants and spectrum users in neighbouring bands to find 'win-win' solutions that fully satisfy TOB requirements. Free TV also offers a single point of contact for other spectrum-users on behalf of commercial TV TOB licensees, also national and subscription TV TOB licensees. In recent times, this has generated a lot of work for both Free TV and its members. This looks set to continue into the future.

Issues identified in this year's draft FYSO with potential implications for TOB include:

- Updates to spectrum licence technical frameworks, including associated technical liaison group work (ongoing work on 2 GHz; future work on 2.5 GHz and spectrum licences in the 2.6 GHz 'mid-band gap')
- Initial investigation work on 2300-2302 MHz (potential addition to 2.3 GHz spectrum-licensed space)
- Initial investigation work on the upper portion of '6 GHz' (5925–7125 MHz)
- Consultation on updates to the 7.2 GHz band provisions in RALI FX3 (7100-7425 MHz) to better accommodate current digital technology use in this band by existing users, including broadcasters and other TOB operators.
- Ongoing monitoring status of 13 GHz (12.75–13.25 GHz), including ITU consideration of Agenda Item 1.15, which concerns use of the Ku band by earth stations in motion.

Not mentioned in the draft FYSO is the pressure from Australia's growing space industry to gain access to S-band spectrum overlapping broadcasters' 2 GHz TOB licences. Some of this work flows from the ACMA's recently-completed 2 GHz review but the larger part is driven by requests to obtain coordinated access to 2 GHz spectrum licensed to broadcasters. These requests fit broadly into three categories:

- Requests to operate earth stations in areas, typically remote from TOB collection sites and areas of intensive TOB use, where satisfactory coexistence arrangements should be readily achievable subject to agreed measures conferring primary status on nomadic TOB operations

- Requests to support rocket launch activities, also in relatively remote areas, where there is potential scope for coordination of TOB and space-related spectrum access on the model of the European Space Agency's long-standing access to TOB spectrum at New Norcia, in WA
- Requests to operate earth stations or perform other space-related activities in areas, typically close to TOB collection sites or in areas with heavy TOB use, where operation is probably not going to be consistent with the desired primary status of TOB operations and the negotiation of coordinated access is liable to be very complex and time-consuming.

Consideration of these requests has proven very labour-intensive for Free TV and its members and is undoubtedly frustrating at times for the other parties too. While development of a body of 'precedent solutions' may help streamline future requests, we would be interested to discuss any other ways we might make things simpler for both TV and the space industry. This might include simplifying space access as a secondary service in spectrum that is seldom used by TOB while more actively discouraging requests to access spectrum in areas of intensive TOB use.

More generally, there may be value in meeting to discuss TOB input and involvement in other ACMA work touching on TOB spectrum.