



**Submission by
Free TV Australia Limited**

Australian Communications & Media Authority

Beyond switchover – the future technical evolution of
digital terrestrial television in Australia

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EXECUTIVE SUMMARY

- Free-to-air television delivers the best of local and international content to all Australians for free.
- Free TV broadcasters are the major investors in Australian content and deliver a range of quality programming across all genres including drama, sport, news and current affairs, children's programming and general entertainment.
- The technical standards underlying the free-to-air platform both in analogue and now in digital are a key element in the success of these services which reach over 99% of Australian households.
- Any planning for the technical evolution of these services must recognise their ongoing importance in a converged media environment and the importance of compatibility with legacy domestic equipment.
- No permanent changes should be implemented before the completion of switchover and restack and the viewer base stabilises following these disruptive events.
- Technical evolution and development cannot occur without access to spectrum for testing and trials.
- The size of the digital dividend means that the scope for such testing is very limited. Spectrum (ideally Channel A) should be reserved immediately to enable the platform to trial and evaluate new technologies.
- Broadcasters should be able to test technologies that will provide enhanced services for all Australian viewers, such as MPEG-4 compression capabilities, UHDTV and 3DTV.
- Change should only be undertaken when standards are fully developed and consumer equipment is available in the market place.
- Of more immediate concern to the continued technical efficiency and evolution of the digital free-to-air platform is the issue of interference from mobile services. The ACMA should prioritise interference management ahead of the medium to longer term issues addressed in the discussion paper.



1 Introduction

Free TV Australia represents all of Australia's commercial free-to-air television broadcasters. Commercial free-to-air television remains the most popular source of entertainment and information for Australians.

Over the past 50 years, Australia's broadcasting policy framework and technical standards have delivered the best free-to-air television services in the world. Currently all of these services are provided using the DVB-T transmission standard and MPEG-2 video compression standard.

Free TV welcomes the acknowledgement contained in the ACMA paper that no technical standards changes should take place that have a negative impact on digital switchover and restack.

Beyond the potential to disrupt switchover and restack there are other issues that need to be taken into account in relation to the timing of any standards migration.

In developing a path to the next generation of platform and service standards, it is important to ensure that:

- Any new standards are fully developed,
- There is spectrum available for a smooth transition, and
- Consumers are not put to unnecessary expense.

For these reasons, any transition to new technologies in the broadcasting environment requires consideration of both technical and policy issues.

Planning for the evolution of these services must recognise the place of free-to-air terrestrial television services in Australia. Although there are a growing number of platforms for the delivery of audio-visual content, free-to-air television is the only service that does not require a paid subscription of some form. It should also be noted that most other subscription services in fact rely on the incorporation of the free-to-air services as a foundation tier in their service packages to attract clients.

The service is free for all Australians, providing valuable public goods such as access to news and current affairs, as well as an investment in the production and distribution of a diverse range of quality Australian content. The maintenance, improvement and future accessibility of these services should be central to the ACMA's consideration of these issues.

The demand for spectrum from other services (particularly mobile broadband) will continue to be a challenge.

Although it is not addressed in the Discussion Paper, the most pressing technical issue facing viewers and broadcasters in the near to medium future is the issue of interference from mobile services.

2 Guiding principles

Free TV believes that there are some principles that should shape the ACMA's consideration of the technical evolution of the digital free-to-air platform. These are:



1. Recognition of the continued role of the digital free-to-air platform as the pre-eminent delivery mode from one-to-many.
2. The need to make spectrum available for testing and simulcast to maximise the opportunities for broadcasters to deliver improvements to viewers, including premium quality services such as 3DTV and UHDTV.
3. A collaborative approach which enables broadcasters to incorporate any migration path into long term business planning.
4. Sufficient lead time for establishment of transmission and receiver standards.

These over-arching principles should form the basis of any migration and evolutionary planning for DTTB.

3 Spectrum: the best delivery mechanism

In the context of the ACMA's discussion paper, it is worth re-iterating the importance of spectrum as the most effective one-to-many delivery mechanism for television in Australia.

A combination of UHF and VHF spectrum has successfully delivered spectrally efficient wide area television broadcasting services in Australia. This means that large populations receive terrestrial television services from relatively few transmitter sites.

TV channel planning has continued to focus on equalisation of services across Australia. Television service coverage has been achieved with spectrum allocations smaller than that allocated to comparable services. For instance, the current spectrum allocation post restack for DTTB services in Australia will be 210MHz for a geographic area significantly larger than Europe, whereas across Europe the allocated spectrum for DTTB is currently 320MHz.

4 Spectrum requirements

4.1 Spectrum availability – the key to successful transition to DTTB

The success of the transition to DTTB in Australia has been largely due to the availability of spectrum for simulcast during the migration.

In January 1997, the Australian Broadcasting Authority's Digital Terrestrial Television Broadcasting Specialist Group recommended that Australia should introduce digital television, adopting a standard that supported the existing 7MHz channelling arrangement that existed for both VHF and UHF analogue television broadcasting. In April 1998, the Australian Government announced its policy to introduce digital television throughout the country from January 2001.

The successful transition was enabled within the short time frame available largely because there was adequate adjacent spectrum to enable a simulcast of the broadcasters' transmissions during the gradual replacement of household TV receivers.

Critically, the history of the introduction of DTTB demonstrates that successful and efficient migration to a new radiocommunications technology requires available spectrum for the introduction of the new technology. This has also been the case for both digital radio and mobile telephone technologies.



4.2 Spectrum scarcity

Since the decision to mandate a Digital Dividend of 126MHz, spectrum for a migration to a new DTTB platform is not easily identified. The substantial reduction in spectrum as a result of the Australian Digital Dividend limits the capacity for a transition to future broadcast technologies. This is a point that has been made repeatedly by Free TV in recent years.

The issue was raised by Free TV during the Green paper consultation stage of the Digital Dividend process, and in other submissions focused on the spectrum demands of technology migration (specifically in relation to DVB-T2 and MPEG-4).¹

The lack of access to spectrum for future innovation in digital television will seriously inhibit the ability of free-to-air television broadcasters to grow, evolve and innovate. This in turn limits their ability to compete with other media platforms in a challenging converged media market.

More efficient transmission or compression techniques for delivering additional services such as 3DTV to free-to-air viewers simply cannot be explored without access to spectrum.

Free-to-air terrestrial television broadcasting is implemented as a “horizontal” platform where broadcasters only method of building a viewer base involves actually transmitting the new service to encourage viewers to purchase equipment.

Similarly, a transition to MPEG-4 and DVB-T2 cannot occur without a reasonable period of simulcast, because of the impact on households with legacy MPEG-2/DVB-T reception equipment. Without it, many viewers face a loss of, or unacceptable interruption to, free-to-air television services.

4.3 Spectrum for testing and simulcast – Channel A

Additional spectrum will be required to support any migration to new technical standards. It will also be required for testing of new services and technologies.

While it is acknowledged that spectrum allocation is a matter for government, the ACMA’s role in advising the government on spectrum issues² means that it is appropriate for it to consult on these issues, develop a position and advise the government accordingly.

To facilitate testing of any new platform and service standards, Free TV recommends that the currently unallocated sixth 7MHz DTV channel (Channel A) be immediately reserved to provide space for testing and field trials of new technologies.

This approach is consistent with the position taken by the ACMA for other sectors, such as mobile telecommunications and digital radio, where spectrum has been made available for field trials according to the need to develop and transition to new technologies.

5 Facilitating the evolution

The transition to DTTB was a successful collaborative process. The availability of spectrum allocated to television broadcasting facilitated the testing and migration path from analogue to digital. Free TV recommends that a similar approach be taken with the introduction of any new technologies.

¹ [Free TV Australia submission to ACMA’s Five Year Spectrum Outlook](#)

² Section 9 of the *Australian Communications and Media Authority Act 2005*



An initial transition to MPEG-4, followed by a longer term transition to DVB-T2, is the approach favoured by Free TV members. It is also the more realistic and sensible approach, given the level of development of the respective technologies and standards. Prioritising MPEG-4 also recognises that a proportion of DTTB receivers in Australia are already MPEG-4 compatible, largely due to the broadcasters' Freeview initiative mandating MPEG-4 in its specifications and the ensuing discussions between broadcasters and manufacturers.

The introduction of DTTB into Australia has taken approximately 10 years. It is anticipated that a similar time frame is required for migration to new technical standards following analogue switch-off and restack. However, this timeframe was reliant on the availability of spectrum for testing and simulcast. The lack of available spectrum may mean that a similar timeframe is not achievable for this evolutionary process.

A cost effective upgrade to platform and service standards (both for consumer and broadcasters) must be backward compatible to DVB and MPEG-2 standards.

It would be prohibitively expensive to consider an upgrade to standards which were not compatible. To date, none of the other worldwide DTTB standards have specified a 2nd generation DTTB delivery specification.

It is highly unlikely that any cost effective migration could be achieved to any platform other than DVB. If an alternative were to be considered it would mean that Australian television broadcasters and television viewers could not take advantage of the backward compatibility of the DVB/MPEG standards.

To ensure that transmission equipment manufacturers and DTV receiver manufacturers are in a state of readiness, the relevant standards would need to be introduced at least 2 years ahead of the introduction of any new DTTB platform specifications. The specifications within these standards would need to be fully explored so maximum backward compatibility could be achieved. This is consistent with the timeframe for the introduction of DTTB in Australia.³

6 Transition to MPEG-4

Transition to MPEG-4 should be treated as a priority, given the potential viewer benefits, the relatively high penetration of digital receivers and the advanced state of development of the technology and standards. Broadcasters are committed to working with the government to enable a transition to MPEG-4 video compression as soon as possible following the completion of the transition to digital television in Australia.

Developing a transition path to MPEG-4 will enable the free-to-air broadcasters (including the national broadcasters) to substantially improve the services they currently offer, within their existing spectrum allocation. Additional channels or the upgrading of existing channels to HD quality will mean a more efficient use of spectrum, and a better overall outcome for the Australian public.

6.1 Spectrum

The issue of spectrum allocation for the introduction of MPEG-4 is examined at page 23 of the ACMA paper. Of the possible interventions listed, Free TV supports the use of the currently unallocated sixth 7MHz DTV channel (Channel A) for testing purposes, where Channel A is available.

³ Standards were released in 1999 and commencement of broadcasting took place in 2001.



The other two proposals by the ACMA (using UHF channel 27) are not appropriate for the testing and development of these technologies. In particular, it would be inappropriate to consider testing and assessing MPEG-4 in a 6MHz channel. Receivers are set up for 7MHz channels so any testing in a 6MHz channel will not produce useful results for broadcasters in any event.

Re-allocating Channel 27 as a 7MHz channel would require clearance of a large number of fixed and mobile services. Free TV assumes clearance of a considerable number of existing fixed and mobile services would require a long lead time. Until and unless a revised, Australia-wide 7MHz Channel 27 (519-526MHz) became available, Free TV supports the use of Channel A for testing purposes.

6.2 Receivers

Free TV agrees with the ACMA paper that one of the primary barriers to this transition is the penetration level of MPEG-4 receivers in Australian homes. Freeview has already incorporated MPEG-4 into the specifications for its consumer equipment to facilitate a transition without disadvantaging viewers. This has been established on the basis of backward compatibility of the MPEG-4 capable receivers to MPEG-2.

While the ACMA paper notes that the proportion of MPEG-4 capable receivers is likely to be substantial, there are further steps that can be taken to improve the penetration levels of MPEG-4 receivers. In the first instance, the ACMA should conduct research to assess the availability of MPEG-4 receivers in the market now, with projections for 5 years into the future.

To encourage take-up, it is also recommended that the relevant Australian DVB-T receiver standard⁴ (AS4933) be amended to make MPEG-4 “essential” or “highly recommended”. This would encourage CE manufacturers to introduce dual and backward compatible decoding in Australian DVB-T receivers as a first step towards the upgrade.

The best method of increasing the penetration level of MPEG-4 capable receivers and to ensure correct operation of the receivers is to have an MPEG-4 service on air. This can be achieved without a negative impact on digital conversion or the restack.

7 Transition to DVB-T2

Transition to a DVB-T2 transmission standard is a more complex undertaking than moving to MPEG-4. This is because the modulation technique is not compatible with the DVB-T standard and cannot co-exist in the same spectral location. Any move to DVB-T2 would involve substantial expense to consumers and broadcasters.

It will be essential to develop DVB-T2 receiver standards which match the technical and regulatory requirements for any Australian DVB-T2 transmissions to suit the local conditions which vary significantly from that experienced in Europe or Africa where DVB-T2 is on air today. ACMA will need to ensure that the technical and regulatory parameters for application of the transmission and DTV receiver standards are in a state of readiness at least 2 years ahead of the introduction of any new DTTB platform.

⁴ AS4933, references ISO/IEC 14496-10 Advanced Video Coding also known as MPEG-4



8 Service Standards

A number of potential new service standards are raised as part of the Discussion Paper. It is difficult to provide feedback on the introduction of these standards while digital TV service specifications for them are yet to be completed.

In general, Free TV supports an approach that allows broadcasters flexibility to test and introduce new technologies that enhance the viewing experience of the Australian public. This must be done in the context of the development of appropriate digital TV service standards, and managed in a way that enables consumers to make a smooth transition, as has been achieved with the transition from analogue to digital television.

8.1 3DTV

Technical standards for consumer equipment able to receive 3DTV broadcasts have not yet been settled. It is therefore possible that the current generation of 3D receivers may not be compatible with future transmission methods.

However, this should not prevent free-to-air broadcasters from developing 3DTV production technology so that it can enable content to be introduced to viewers at the earliest possible opportunity. We note that the ACMA has approved 3DTV trials in the past and that these have been very valuable in exploring the potential of 3D technology. Free TV recommends that the ACMA allow scope for broadcasters to continue to test and roll out this service when and where possible.

8.2 UHDTV

A UHDTV terrestrial television broadcasting format has yet to be developed for terrestrial delivery.

However, UHDTV broadcasts are commencing on a trial basis in a number of other jurisdictions.⁵ Australian television broadcasters should be enabled to evaluate and experiment with these technologies when they become available, as they have the capacity to substantially improve free-to-air services for viewers in Australia.

8.3 Audio Description

The Discussion Paper refers to the Media Access Review findings in relation to audio description (AD), including the amount of space it requires as part of the transport stream. Free TV does not support the introduction of audio-describing of television content and does not agree that it should be raised as part of the discussion on the technical evolution of digital terrestrial television more generally.

The current digital receiver and transmission standards (AS 4599 and AS 4933) do not make provision for the transmission or reception of audio-description services. It is likely that a significant proportion of the population would not be able to receive these services without investing in additional equipment.

A more fundamental issue is the substantive difference between audio-descriptions, which require the creation of new content, and captions, which merely translate existing content into written form.

⁵ In 2008 Japanese broadcaster NHK, Italy's RAI, BSkyB, Sony, Samsung, Panasonic, Sharp and Toshiba demonstrated the first live transmission of UHDTV, from London to the IBC conference site in Amsterdam. In January 2011 Korean television manufacturer LG presented an 84-inch 3-D UHDTV receiver at the consumer electronics show in the United States. In 2012 the BBC intends to trial UHDTV during the Summer Olympic games. In a report for Ofcom a number of projections are provided for delivery of UHDTV by terrestrial broadcasting in 2020: see http://www.zetacast.com/Assets/Beyond_HDTV.pdf



Free TV raised these issues in its submission to the Media Access Review and we maintain our view that whilst both captioning and audio-descriptions are services that seek to improve access to electronic media for people with a sensory disability, these services raise quite distinct issues for television broadcasters, regulators and users. They should not be dealt with as part of this process.

In response to recommendations of the Media Access Review, the government has undertaken to commence another review of captioning and audio description on electronic media in Australia by 2014. This is the most appropriate forum for examining the issue of audio-description.

9 Interference Management

The Discussion Paper is focused on the technical evolution of digital terrestrial television in Australia.

Free TV understands the need to commence a discussion of these issues, but is concerned that the more urgent issue of interference from mobile services into broadcasting services, given its potential impact on the reception of digital terrestrial services in the future, has not been given priority.

The 126 MHz Digital Dividend spectrum (694MHz-820MHz) will be auctioned later in 2012 and is likely to be re-allocated to mobile services. These services have the potential to interfere with digital television receivers.

Broadcasters are legally required to have restacked below 694MHz by 31 December 2014 and it is expected that the new services will commence as soon as restack is completed. At this point no discussions have commenced with broadcasters on how interference issues will be managed.

Free TV submits that this issue should be the top priority for the ACMA to ensure that there is no negative impact in the digital conversion and restack programs as dictated by government on page 8 of the issues paper.