The future delivery of radio services in Australia

Issues paper

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Canberra

Red Building
Benjamin Offices
Chan Street
Belconnen ACT

PO Box 78
Belconnen ACT 2616

T +61 2 6219 5555
F +61 2 6219 5353

Melbourne

Level 32
Melbourne Central Tower
360 Elizabeth Street
Melbourne VIC

PO Box 13112
Law Courts
Melbourne VIC 8010

T +61 3 9963 6800
F +61 3 9963 6899

Sydney

Level 5
The Bay Centre
65 Pirrama Road
Pyrmont NSW

PO Box Q500
Queen Victoria Building
NSW 1230

T +61 2 9334 7700 or 1800 226 667
F +61 2 9334 7799

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Written enquiries may be sent to:

Manager, Editorial Services
PO Box 13112
Law Courts
Melbourne VIC 8010
Email: info@acma.gov.au

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# Introduction

Radio delivers audio entertainment and information daily to millions of Australians. In 2018, more than 10.7 million people tuned in to commercial radio alone each week in the five major capital cities.[[1]](#endnote-2)

In Australia, radio is provided to audiences:

* through different categories of services—free-to-air terrestrial commercial, national and community broadcasting, narrowcasting and streaming services

to different devices—AM, FM and DAB+[[2]](#endnote-3) receivers in homes, workplaces and cars, to mobile phones, tablets and virtual assistants, digital and smart televisions.

Whatever the service or its receiving device, radio is delivered using radiocommunications spectrum—whether via AM or FM (radio and television) frequencies, or over UHF and other frequencies used by telecommunications providers to deliver mobile and wireless services.

Technological developments and changes in listener behaviours are impacting the delivery of radio services in different ways in metropolitan and regional and remote areas. For example, AM frequencies in metropolitan areas are increasingly affected by interference and listeners are shifting to higher quality FM services. However, AM remains critical in regional and remote areas of Australia for wide-coverage local broadcasting content, including crucial coverage during times of emergency. More than 4.2 million Australians listened to commercial radio via a DAB+ digital radio each week (up from 3.6 million in 2017) and 2.2 million listened online on a connected device (up from nearly 1.9 million in 2017).[[3]](#endnote-4)

The ACMA considers it timely to ask Australian broadcasters and audio content providers about emerging technologies, the impact on their businesses and the choices these create for the radio industry, including how radio will be delivered to Australian audiences in the future in metropolitan and in regional and remote areas. The challenges facing metropolitan radio industry participants are different to those participants operating in regional and remote areas. Spectrum availability, technology uptake and audience preferences influence business decisions and future investment in current and new technology and services. The needs of broadcasters and audiences also differ due to variations in coverage, available services and viability of those services. These differences are discussed throughout the paper.

Drawing out the issues will help inform future ACMA consideration of broadcasting planning priorities and assist the ACMA to achieve our objectives outlined in the [*ACMA corporate plan 2018-19*](https://www.acma.gov.au/theACMA/acma-corporate-plan). In particular, the ACMA will need to manage available spectrum resources in an effective and efficient manner. This includes understanding the roles of AM, FM, digital and Internet Protocol in the future delivery of radio services in cities and in country and outback areas of Australia.

The ACMA is now inviting comments and views from industry about:

* the drivers of radio industry change, to elicit evidence about the current market and suitability of alternative audio content delivery platforms, including alternative spectrum approaches needed to support radio in the future

the impact of new delivery platforms on the achievement of broadcasting policy objectives and the existing regulatory framework.

We have posed three scenarios to stimulate discussion about the future delivery of radio services and the potential impact for spectrum planning on these two broad themes:

* Scenario one—radio makes greater use of FM technology
* Scenario two—AM and FM radio progressively migrates to digital radio

Scenario three—free-to-air terrestrial radio progressively migrates to online streaming.

We also invite submitters to consider other possible scenarios or their own combination.

These scenarios do not reflect the views, regulation or policy of the ACMA or the Australian Government. As the government is currently in a caretaker period, it is noted that the spectrum management policies of an incoming government may have implications for future radio planning arrangements.

The ACMA encourages industry, market participants and the public to raise other issues that they see as relevant to the conversation about the future delivery of radio services in Australia.

# The regulatory framework

The *Broadcasting Services Act 1992* and the *Radiocommunications Act 1992*, which, together with their subordinate legislation, provide the statutory framework for the planning, licensing, programming and access arrangements enabling free to air terrestrial radio in Australia.

Audio content services delivered via the internet are regulated under the Broadcasting Services Act, specifically under Schedules 5 and 7 (concerning prohibited and potential prohibited online content) and under Schedule 8 together with relevant online content service provider rules (concerning gambling advertising).

The 2016 ACMA Review[[4]](#endnote-5) and the Spectrum Review[[5]](#endnote-6) report both recognised the challenges of adapting new technologies using the current regulatory framework. The ACMA Review brought together a list of enduring policy concepts in communications legislation identified in previous work undertaken by the ACMA and the Department of Communications and the Arts, which remain relevant to the communications sector despite the ongoing technological and market change[[6]](#endnote-7). These include:

* access to services/participation in society
* competition
* network reliability and interconnection
* efficient allocation and use of resources
* national interest
* diversity of voices
* localism
* Australian identity and

community values and safeguards.[[7]](#endnote-8)

Terrestrial radio broadcasting continues to deliver on these enduring policy concepts despite the effects of new technologies on the industry. AM, FM and digital radio are delivered free-to-air, ensuring that anyone with the appropriate receiver can access radio services. Local radio services provide a sense of Australian identity and play a crucial role in delivering diverse local content and services to metropolitan, regional and remote communities around Australia.[[8]](#endnote-9)

The ACMA notes that the delivery of these social policy goods is under pressure from the impact of technological developments on methods for delivering audio content (for example, traditional radio versus internet radio and streaming), with consequential impacts on the overall effectiveness of current regulatory tools.

The ACMA invites further consideration of the relevant enduring policy objectives that should guide the future delivery of radio services in Australia.

# Changes in the radio environment

This section provides a summary of the current and emerging themes and trends in the communications and media sector with a focus on radio. The ACMA is keen to test its understanding of the relevant technological and industry developments that are shaping the radio industry, and the delivery of radio services to metropolitan and regional audiences.

## Radio listening is strong, but audience preferences are changing with technology

Radio listening remains popular across a range of listening platforms.

At May 2018, nearly all Australian adults (95 per cent) had at least one radio[[9]](#endnote-10)—67 per cent had a radio at home and 90 per cent had one in their car.[[10]](#endnote-11) Eighty-six per cent of Australian adults listened to some radio in an average seven-day period in the 12 months to June 2018, consistent with the previous four years.[[11]](#endnote-12)

Commercial Radio Australia’s recent listening summary noted that more than 10.7 million people tuned in to commercial radio each week in the five major capital cities during 2018, an increase of 270,000 listeners or 2.6 per cent over the previous year.[[12]](#endnote-13) Australian adults spend more time listening to free-to-air terrestrial analog radio (AM and FM) than digital or online. ACMA-commissioned research shows that at May 2018, in the previous week, the average time spent listening in the car or at home across platforms was:

* FM—7.8 hours
* AM—4.7 hours
* digital radio—1.3 hours

online—1 hour.[[13]](#endnote-14)

Overall time spent listening to radio increases with age. At May 2018, ACMA-commissioned research found that older Australians (aged 75 and over) spent an average of 20.6 hours listening to radio in the past seven days compared with 11.5 hours for those aged 18–34. AM radio usage is higher among those aged 45 and over, while younger audiences spend more time listening to FM radio. Listening to radio online is highest among those aged under 45.[[14]](#endnote-15)

For regional Australians, radio is even more highly valued. ACMA research undertaken in 2016 found that remote Western Australians spend significantly more time listening to the radio (AM, FM and online) than the nation. The number of hours spent listening to AM radio in remote areas is double the regional and national levels, with most of the time spent listening to radio in the car.[[15]](#endnote-16)

Listening to digital radio has also become more prevalent, with increased penetration of digital radios. According to Commercial Radio Australia, more than 4.2 million Australians listened to radio via a DAB+ digital radio each week (up from 3.6 million in 2017).[[16]](#endnote-17) In the last 12 months, 47 per cent of new cars sold in Australia had DAB+ fitted or offered DAB+ as an option.[[17]](#endnote-18) Bluetooth audio streaming has been available in new cars since 2011.[[18]](#endnote-19) Auxiliary connections enable the use of smart phones, and also enable access to streaming apps in the car.[[19]](#endnote-20)

However, it remains the case that most cars on the road in Australia today have only an AM and FM receiver[[20]](#endnote-21). The average age of Australian cars is 10.1 years, which has been static for at least a decade, and suggests a slow turnover, meaning it may be a long time before new technology is available to most drivers.[[21]](#endnote-22) This means existing metropolitan area commercial and national AM radio transmitters remain vital, even though they are substantially duplicated by higher quality DAB+ digital radio signals.

## A complex range of free-to-air terrestrial radio networks operate

The free-to-air terrestrial radio industry is a complex sector, with each broadcasting service provider facing different challenges to their business models.

### Commercial radio

The commercial radio sector is comprised of an extensive infrastructure base of AM and FM transmitters, servicing metropolitan, regional and remote communities via high power and low power transmitters.[[22]](#endnote-23) Commercial digital radio is also delivered via a network of shared DAB+ digital radio multiplex transmitters in each capital city, except Hobart.[[23]](#endnote-24)

From a ratings perspective, commercial radio dominates the radio sector in both AM and FM radio markets.[[24]](#endnote-25)  In terms of the ownership and control of commercial radio services, in 2016-17, Southern Cross, Australian Radio Network Pty Ltd, Nova Entertainment Pty Ltd and Macquarie Media Limited owned most capital city commercial radio broadcasting licences.[[25]](#endnote-26) In regional areas, Southern Cross, Broadcast Operations Pty Ltd (Super Radio Network) and Grant Broadcasters Pty Ltd were the three largest networks.[[26]](#endnote-27)

### National broadcasters

The national broadcasters (ABC and SBS) operate an extensive high-power network of AM and FM transmitters, which covers metropolitan, regional and remote areas.[[27]](#endnote-28) SBS delivers its regional services via retransmission.[[28]](#endnote-29) The ABC and SBS share DAB+ digital transmitters in all capital cities. ABC and SBS perform strongly in the ratings in both metropolitan and regional areas for their AM and FM services.[[29]](#endnote-30)

Compared with commercial radio, the national broadcasters’ radio services face different conditions on coverage and often have different coverage areas. While commercial and community services are restricted to their geographic licence areas in a way that national services and radio streaming services are not, licence areas assist in delivering relevant local content and services to local communities. As they are restricted only by power, high-powered national AM services may serve much larger areas than commercial services. The ABC’s highest power regional AM services provide unique and critical wide-coverage to regional listeners, including listeners in cars outside of populated areas.

### Community radio

The community radio sector is diverse, providing local, community and niche services mainly via FM to metropolitan and regional audiences.[[30]](#endnote-31) Indigenous broadcasting transmissions serve remote communities as well as many regional and urban areas.[[31]](#endnote-32)

Community digital radio services are available from licensees holding licences with the same (or deemed) licence area as the commercial licence area at the discretion of the representative company of community broadcasters. In the capital cities, there are wide-area community services as well as more localised services covering sub-metropolitan regions of each city.

### Narrowcast radio

Narrowcast radio services number approximately 2,600 niche services, providing a plethora of content choices utilising Low Power Open Narrowcasting (LPON)[[32]](#endnote-33) and High Power Open Narrowcasting (HPON)[[33]](#endnote-34) licences.

### Retransmissions

Finally, third party retransmissions of mainly national and commercial services number around 800. These radio retransmissions provide services in the areas uneconomic to serve directly by broadcasters.

### Digital radio

Australia’s DAB+ digital radio rollout is designed to supplement rather than necessarily replace analog radio. Commercial and national operators are offered the opportunity to introduce DAB+ in each commercial licence area, and wide-coverage community broadcasting services are entitled to obtain access to the digital multiplex infrastructure in any other market where the commercial broadcasters choose to introduce DAB+.

To date, DAB+ has only commenced in capital cities, confining the opportunities for community radio access to DAB+ to those markets. Open narrowcasters have no rights to obtain access to DAB+ transmitters. Meanwhile, the broadband nature of DAB+—each transmitter is designed to carry multiple FM quality radio services—combined with spectrum scarcity, arguably makes the technology poorly suited to replace services, such as smaller local community services and many narrowcasters, that have small, unique coverage areas.

### Table 1: Free to air radio delivery snapshot

|  |  |  |
| --- | --- | --- |
| **Category** | **Content licences** | **Transmitter licences** |
| Commercial (BSB) | 261 | Total: 600—100 AM, 500 FM |
| National | N/A | ABC: Total: 700—100 AM, 600 FMSBS: Total: 15—6 AM, 9 FM |
| Community | Long term: 357Short Term: 101 | Total: 415—13 AM, 402 FMTotal: 134—1 AM 133 FM |
| Narrowcasting | Class licence | Total: 2610—240 HPON, 2370 LPON |
| Retransmission | Exempt | 830 |

*Source: ACMA licensing registers. In addition to the AM and FM transmitters the commercial, community national broadcasters provide DAB+ services in each state capital.*

## Alternative platforms for radio content are proliferating

Alternatives to free-to-air radio content from Australia and abroad are proliferating, primarily online. These services are available on mobile devices, which use spectrum outside the broadcasting services bands, such as mobile broadband spectrum and the Wi-Fi bands. Faster and cheaper data access on mobile devices is changing the direction of the market for music in areas with good mobile coverage. It is being driven by consumer appetite for on-demand services on the device of their choice.

ACMA research shows that music streaming services are increasing in popularity. At May 2018:

* 46 per cent of Australian adults had used a music streaming service such as Spotify or Apple Music in the last seven days, an increase from 37 per cent in 2017.
* Spotify is the most used music streaming service (59 per cent) followed by Apple Music (16 per cent).
* Australian adults spend an average of 9.8 hours a week streaming online music services.

Younger listeners (aged 18–24) spending an average of 15.6 hours a week.[[34]](#endnote-35)

The availability of new technologies, in particular, streaming and audio on-demand, capable of being delivered to smartphones through 3G, 4G and soon 5G wireless technology presents as both a challenge to terrestrial incumbents (no regulatory barriers to entry, minimal compliance costs) and an opportunity (potential replacement or supplement for AM and FM over time).

This diversity of services, content and funding models across the free-to-air terrestrial radio industry, together with differing opportunities to access emerging broadcasting platforms in metropolitan and regional and remote areas, means that there is unlikely to be any single path forward for all radio broadcasting industry participants.

## AM radio remains vital but is under pressure

Changing listener behaviour is putting pressure on Australia’s free-to-air radio broadcasters to adapt and compete.[[35]](#endnote-36)

The audience base for AM has been gradually declining ever since the introduction of FM radio from 1980. In 1980, AM accounted for 93 per cent of the audience share in the Sydney market.[[36]](#endnote-37) By comparison, in the six months to May 2018, 80 per cent of adult Australians were listening to FM compared with 37 per cent listening to AM.[[37]](#endnote-38)

In metropolitan areas, AM services are also available on DAB+ for listeners with a digital receiver. In regional areas, FM remains the only alternative delivery method for many listeners. As the NBN rollout continues, the streamed simulcasts of AM services become a more viable alternative for listening in regional areas, for example via aggregator applications and websites. The growth of 4G and soon 5G mobile broadband coverage will provide better access to this programming via mobile devices in vehicles. However, this is a long-term prospect. The capability of internet streaming, audio on-demand and delivery via mobile broadband to provide reliable wide area coverage, especially in regional areas and in times of emergency, is a potential limitation, unless improvement in the coverage of mobile broadband services can be achieved.

Despite these pressures, AM radio remains socially and economically important (particularly in regional Australia)[[38]](#endnote-39) because it provides the only current platform for delivering many regional Australians with wide coverage[[39]](#endnote-40) local broadcasting content, including crucial coverage during times of emergency.

## No single replacement technology for AM or FM radio has emerged

AM and FM radio offer ubiquitous, fixed and mobile reception to most Australians using cheap and extremely widespread devices, including devices that are virtually standard in the national car fleet.

The technical characteristics of AM radio offer some significant advantages but also face limitations. In Australia, AM radio transmissions operate in the medium frequency (MF) band in the frequency range 526.5–1606.5 kHz. AM signals travel over much greater distances, giving wider coverage which is suitable for providing services to sparsely populated areas.

Compared to FM, AM has a narrower bandwidth that contributes to a poorer audio quality, so the remaining viable AM formats tend to be talk rather than music-based. AM also has greater susceptibility to electrical and other human-generated interference. This interference rises in proportion to the density of human settlement, so is increasing as Australia’s cities expand and densify. AM radio signals also have difficulty penetrating apartment blocks.

The ACMA understands that AM radio also has an ageing infrastructure. AM transmission sites, which are typically very large areas of flat land near to urban areas, are increasingly scarce. Some major AM transmission sites are coming under pressure from alternative higher value uses of land and transmission of AM radio may cease to be the highest value use of these sites.

FM services operate in the Very High Frequency (VHF) band in the frequency range 87.5– 108 MHz and typically require a line-of-sight between the transmitter and receiver. FM antennas require little land and are often co-located on existing communications facilities. With its better audio signal to noise ratio, greater frequency response and dynamic range compared to AM technology, FM produces better quality sound, which is considered particularly important for music-based program formats.

In the absence of a clear, or at least ready, replacement technology offering all the characteristics of analog radio, there is increasing industry interest in options for the conversion of some existing AM radio services to higher quality FM, such as the conversion of commercial broadcasting services in solus[[40]](#endnote-41) markets in regional areas.[[41]](#endnote-42)

Australia began a modest process of industry-led AM to FM conversions in regional areas in 2016, which has resulted in the switch-off of AM services in a small number of solus licence areas where frequencies were available. However, the conversions are not widespread nor is it possible to easily offer conversions in more congested licence areas due to spectrum scarcity.

DAB+ is the technology currently being used to provide digital terrestrial radio services in Australia. Use of DAB+ involves sharing spectrum (the same spectrum used by digital television services) and infrastructure (i.e. a multiplex) shared between broadcasters in a particular area, and as a result, it has consequences for the planning and timing of service roll out in an area.

While DAB+ penetration into new vehicles is growing,[[42]](#endnote-43) and radio streaming into vehicles is also an emerging option,[[43]](#endnote-44) unless there is widespread conversion of existing vehicles, it is likely to take several years before another technology can match the ubiquity of AM and FM radios in cars. There are also significant coverage challenges in Australia, including geography, the low availability of DAB+ receivers in cars, and the availability of suitable spectrum, that mitigate against DAB+ as a replacement technology in regional and remote areas. DAB+ has been regarded as supplementary technology in metropolitan areas.

Other digital technologies, such as digital radio mondiale (DRM), can utilise Medium Frequency (MF) channels to deliver much higher sound quality. It is designed to work over the bands currently used for AM broadcasting, but its introduction would require significant investment in new radio infrastructure and receivers.

Given these different technologies and listener preferences, the ‘glide path’ for the future delivery of radio services is far less clear than for television, where a single new technology was evident and preferred.

## Demand for spectrum is increasing, but radio spectrum is mainly valued for its current use

Demand for spectrum by telecommunications service providers is growing for applications such as 5G wireless broadband, however these pressures have not in general fallen on the spectrum currently used for radio broadcasting.[[44]](#endnote-45) The ACMA observes that the main demand for spectrum used by free-to-air terrestrial radio comes from radio itself.

While there appears to be no foreseeable demand for AM spectrum other than for radio, there is increasing demand for FM frequencies to facilitate the conversion (or simulcast) of AM services to FM. There is a level of continuing demand for access to FM frequencies from aspirant radio services, most commonly for community broadcasting and narrowcasting services. In many parts of Australia, the FM band is congested with little to no opportunity to identify new frequencies, particularly for wide coverage services. However, in some areas, such as Perth, spectrum is less congested, which presents an opportunity to plan new frequencies.[[45]](#endnote-46)

In late 2018 the ACMA completed regional frequency allotment planning for the 14 MHz of VHF spectrum available for DAB+. Because DAB+ shares the VHF spectrum with television, it is not possible to increase spectrum for DAB+ without compromising television allocations.

The ACMA’s Five Year Spectrum Outlook 2018-22 observes that broadcasting planning has distinctive features that affect how demand for spectrum is managed, including government intervention and Ministerial discretion over variations to the broadcasting services bands. [[46]](#endnote-47)

Together, these factors will have implications for planning future services in metropolitan and regional and remote areas.

## Diverse approaches are being adopted internationally

Internationally, a range of different approaches are being adopted for the future delivery of radio services, although terrestrial AM delivery is in slow decline.

AM radio transmission was turned off in the Netherlands in 2015 and turned off in Germany, Luxembourg and France in 2016.[[47]](#endnote-48) The British Broadcasting Corporation (BBC) commenced its progressive switch-off of AM services in 2012, switching off 13 AM radio stations in January 2018.[[48]](#endnote-49) Other AM radio broadcasters have followed. [[49]](#endnote-50)

In the United States, AM has been progressively switched off across numerous states by individual broadcasters. However, this trend has been tempered somewhat by the Federal Communication Commission’s AM revitalisation project, which allows AM broadcasters to retransmit their services on FM translators.[[50]](#endnote-51)

There is no global common approach, or dominant emerging single technology, in radio broadcasting. FM broadcasting remains widespread around the world. In the United Kingdom, BBC Local is 100 per cent FM. In Canada, CBC Radio 1 is 95 per cent FM and in New Zealand, RNZ is FM-only. In Europe most radio broadcasts are either in FM, DAB or DAB+. Digital radio has increased its coverage and take-up in Europe. In its 2017 *Digital Radio Report*, Ofcom reported that UK-wide BBC DAB coverage was at 97.4 per cent in-home. UK-wide commercial DAB coverage was at 91.7 per cent in-home.[[51]](#endnote-52) Also in 2017, household DAB radio take-up in the UK was at 61 per cent.[[52]](#endnote-53)

Europe is unique in that it is the only region where DAB/DAB+ is, in some markets at least, replacing analog radio. For example, Norway completed its switch-off of national FM radio in favour of DAB/DAB+ in December 2017.[[53]](#endnote-54) Norway indirectly benefits from the regulatory environment in the European Union that supports the mandatory inclusion of digital radio receivers in all new cars.[[54]](#endnote-55)

Compared to other jurisdictions, Australia’s terrestrial radio broadcasting environment differs considerably in terms of geography, population, technology and regulation. Australia is a large, geographically diverse country that is sparsely populated outside of metropolitan and larger regional areas. AM radio prevails in regional and remote areas due to its ability to offer wide area services.

The ACMA invites comments and views about the drivers of radio industry change presented here about the current market and suitability of alternative audio content delivery platforms, including alternative spectrum and regulatory approaches needed to support radio in the future.

# Future scenarios

## Understanding the future of radio through scenario testing

This issues paper puts forward three scenarios and a series of questions following each scenario to obtain better information from stakeholders about the issues affecting the future delivery of radio services in Australia.[[55]](#endnote-56)

Each scenario considers an alternative future with a focus on a specific technology platform, namely FM, digital and online streaming. By using the scenarios, the ACMA hopes to stimulate discussion around the alternative futures for radio based on different combinations of assumptions, facts and trends, and to illuminate areas where more information and understanding is needed.

The scenarios (and the questions following each scenario) do not represent the opinion, views, regulation or policy of the ACMA or the Australian Government.

## Scenario one—radio makes greater use of FM technology

This scenario envisages greater use of FM technology for delivery of free-to-air terrestrial radio services over the next 10 years and considers some of the practical issues this raises for industry and the ACMA. This scenario imagines the continuation of the current AM–FM conversion process and the expansion of the conversion policy to competitive markets, which may include AM to FM conversion under current planning rules, under changed planning rules, or via expansion of the FM band. The scenario also envisages a steady, but not exponential growth in DAB+ and online listening. It is acknowledged that the concentration of both AM and FM services in most metropolitan markets means that it would not be possible to convert all metropolitan AM services to FM, even with the various measures canvassed below.

To date, the ACMA has prioritised AM–FM conversions in regional solus markets. This approach has been subject to two caveats: that existing services are not to be adversely affected (except by commercial arrangement); and that there must be no significant coverage differences, so most listeners who received services in AM can continue to do so following FM conversion.[[56]](#endnote-57)

The current process of AM–FM conversions has been challenging and resource intensive for industry and the ACMA due to the historical allocations of FM frequencies in the 1990s, the resultant congestion in the FM band, the amount of engineering work required to accommodate the conversions and the subsequent process for changing the relevant licence area plans.[[57]](#endnote-58) To date the ACMA has converted 11 AM services to FM.[[58]](#endnote-59) The remaining markets are proving difficult to progress because many solus services are in or adjacent to areas where FM is already heavily congested due to previous expansions of radio. The progress and timing of AM–FM conversions in regional solus markets is currently dependent on the completion of engineering reports by the industry’s consultants.

The ACMA continues to prioritise AM–FM conversion in solus markets as and when it receives the engineering reports. Following receipt of an engineering report the ACMA carefully considers the proposal to satisfy itself that any coverage loss from a conversion is mitigated to the extent practicable and that interference is not unreasonably caused by the proposed frequency.

To provide for AM–FM conversions outside of solus markets, the ACMA could consider revising its planning arrangements to fit in more radio services. Currently the radiofrequency planning protection requirements are based on achieving a high signal to noise ratio,[[59]](#endnote-60) that is, the current rules place a premium on protecting the wide reception of planned FM services. The costs of any major change to the planning arrangements may include the need for existing services to retune, and potentially, reduction in the coverage areas of existing services. There may also be some more minor changes in the planning rules that do not result in a wholesale replanning of the FM band, but could nevertheless increase the supply of FM frequencies, such as reviewing the current assumptions about reference receivers on which the planning rules rest.

Another supply-side option could be for the ACMA to use its planning powers under Part 3 of the Broadcasting Services Actto repurpose allotments of spectrum that has been planned in a licence area plan (LAP), but for which no FM transmitter has been established. For example, there are over 50 LAP spectrum allotments for national broadcasting, for which no corresponding transmitter licence has been taken out by a national broadcaster. Not all these frequencies would necessary be useful for converting high power AM commercial services to an equivalent FM service—some will be suitable only for low power or may not be planned for commercial licence areas that need to convert. Removing allotments that have no real prospect of being implemented in the short to medium term is consistent with the legislative obligation that the ACMA plans in a manner that promotes the efficient and effective use of spectrum, noting the current uses of spectrum as currently planned.

An alternative approach to fixing the current scarcity could be to extend the current FM band. Brazil has extended its FM band down to 76 MHz. This means affordable FM radios with a wider tuning range than current Australian models are likely to be available. While expanding the FM band could potentially supply the multiple high-power frequencies required for a wholesale migration of AM services to FM, AM switch-off may not be feasible until enough listeners, including in-car listeners, had upgraded their radios. Extending the existing broadcasting services bands will have implications for services (including non-broadcasting services) operating outside the bands, as well as for services at the lower end of the existing band.[[60]](#endnote-61)

Finally, the line-of-sight nature of FM signal propagation means that an FM transmitter will generally have a smaller service area than an AM transmitter. This technical limitation may have an impact on audiences in areas that cannot receive the FM transmissions, especially those living in remote areas.

1. What are the current infrastructure and cost challenges facing AM radio?
2. What are viable options to supplement or replace AM radio over the next 5–10 years?
3. What are the benefits and impacts of an extension to the FM band?
4. What specific spectrum planning changes should the ACMA consider?

## Scenario two: AM and FM radio progressively migrates to DAB+ digital radio

This scenario envisages the migration of all analog free-to-air terrestrial radio services, including AM and FM, to digital radio over the next 10 years, either as a major city solution, or as an Australia-wide solution. The scenario imagines a transition period where AM is phased out in the metropolitan markets, or other markets, once there is ubiquitous DAB+ coverage. Variants of the scenario could address the problem of large areas which are served by AM but not DAB+. In these areas, AM could be switched off, but FM transmission will need to be utilised until DAB+ coverage, including in cars, could be assured. This scenario envisages a more rapid shift to DAB+ than in scenario one. This scenario is not dependant on the take-up of online services.

Digital radio services have been running on a permanent basis in the metropolitan areas of Adelaide, Brisbane, Melbourne, Perth and Sydney since July 2009. The national services commenced broadcasting digital radio in Canberra and Darwin in December 2017 and in Hobart in March 2018. It is expected that community and commercial digital radio services will commence permanent digital radio services in Canberra, Hobart and Darwin in 2019. Once the commercial and community digital radio services are on-air, the capital city rollout of digital radio will be complete.

In Australia, supporters of digital radio mondiale (DRM) continue to advocate its consideration as an alternative digital standards family to DAB+. The *Digital Radio Report* noted that DRM is not considered a viable option in the short to medium term in Australia due to the lack of receivers available in the market which receive DRM or both DRM and DAB+.[[61]](#endnote-62) Internationally, take up of DRM technology has been slow. However, as transmission and receiver technology evolve, DRM and its variants, DRM30 and DRM+, may be considered attractive alternative transmission standards.

Compared to either DRM or the expanded FM band option considered in scenario one, DAB+ already enjoys a long head start in receiver uptake. However, key to the success of scenario two would seem to be a successful campaign over time to upgrade the entire national car fleet, as well as most Australian homes, to receive DAB+ (or other digital alternative).

Spectrum planning for the regional rollout of DAB+ has highlighted that the spectrum available for DAB+ is very limited. Only eight frequency blocks are available for DAB+, with the remainder of the band planned for TV broadcasts. This may affect the coverage of DAB+ compared to existing FM services in some markets and/or increase the cost of rollout due to the need for infill transmitters.

Experience with planning for DAB+ in regional Australia to date suggests that the necessary roll out of all national, community and commercial broadcasters throughout regional areas may require a more compelling business case than exists at present.

1. How could local geographic area community broadcasters and narrowcasters, (not currently eligible for DAB+) be accommodated in such a scenario?
2. Could wide coverage national AM services be economically and technically matched in DAB+? Is DRM a viable alternative transmission technology? Are there other technology, market or conversion options (e.g. some markets only)?
3. What role might a decision mandating the eventual switch-off of analog transmitters play, either in providing a business case for investment in digital radio transmission or in encouraging uptake of digital radios? What are the risks associated with such a decision?
4. What specific spectrum planning changes should the ACMA consider?

## Scenario three: free-to-air terrestrial radio progressively migrates to online streaming

This scenario envisages a progressive shift from delivery of radio services via the broadcasting services bands to delivery via online streaming over the next 10 years. It envisages a future where terrestrial delivery (AM, FM and DAB+) has significantly declined, where some terrestrial services may have ceased (e.g. metropolitan AM), where audiences have access to a tablet, smartphone or other relevant smart device at home and in the car, and that ubiquitous connectivity is assured.

In this scenario, radio services have migrated to online delivery. Accessing the existing AM and FM radio services delivered by commercial, national and community broadcasters is increasingly done online.

In this scenario there will be cost savings to broadcasters as the transmission infrastructure will no longer need to be maintained. This will be offset by the increased costs of server infrastructure as listeners migrate to online. This contrasts with terrestrial broadcasting, where the marginal cost of serving an additional listener is zero.

In the streaming scenario, regional broadcasters can compete with metropolitan broadcasters and the world, and vice versa. Technological advancements in voice automation in the home and in cars will continue to make streaming more accessible. For example, in 2017, a UK study found that 67 per cent of in-home listening on Amazon Echo is for live radio.[[62]](#endnote-63) Free-to-air terrestrial radio services are competing with alternative platforms in the online streaming environment. National broadcasters and commercial broadcasters have been investing in applications to enable new methods of content consumption, including simulcasting, new content, catch-up content and on-demand content.[[63]](#endnote-64) Smaller regional operators and community services may face affordability issues.

The capability of internet streaming, audio on-demand and delivery via mobile broadband to provide reliable wide area coverage, especially in regional areas and in times of emergency, is a potential limitation of this scenario, unless improvement in the coverage of mobile broadband services can be achieved.

Finally, streaming and terrestrial are considered different broadcast streams and thus have different copyright and regulatory implications for broadcasters.

1. How well will wireless internet connectivity match the coverage of existing free to air terrestrial analog and digital radio? When and how will online streaming be capable of delivering popular real-time radio services simultaneously to a mass audience?
2. In what circumstances will it be feasible, or equitable, to rely on wireless broadband networks to deliver services currently delivered via broadcast free- to-air to almost all Australians?
3. What are any other implications of this scenario for free to air terrestrial radio in the broadcasting services bands?
4. What specific spectrum planning changes should the ACMA consider? Are there any spectrum implications of this scenario?

## Other scenarios, or combinations of the above

The ACMA invites submitters to consider other possible scenarios or combinations of the above.

# Next steps

The ACMA recognises the exciting opportunities presented by the changes occurring in the radio market and the challenges facing the Australian radio industry in continuing to adapt to and exploit the new media. The ACMA is well-placed to facilitate an ongoing dialogue with the radio industry and government about the future of the delivery of radio services. This issues paper is the first part of an ongoing conversation. The ACMA will also be initiating bilateral and multilateral stakeholder engagement, including a workshop in the first half of 2019.

The second step will see the ACMA report its findings from the public consultation process and any other relevant information or research that the ACMA may have sought about the future of radio to government in the second half of 2019.

This report may then be used to inform future planning priorities and to highlight any regulatory issues or questions for the ACMA posed by the future development of radio.

# Invitation to comment

## Making a submission

The ACMA invites comments on the issues set out in this discussion paper.

* [Online submissions](http://www.acma.gov.au/theACMA/Consultations/Consultations) can be made via the comment function or by uploading a document. Submissions in Microsoft Word or Rich Text Format are preferred.
* Submissions by post can be sent to:

The Manager
Broadcasting Carriage Policy Section
Spectrum Management Policy Branch
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

**The closing date for submissions is 5pm on Friday 12 July 2019.**

Consultation enquiries can be emailed to bcp@acma.gov.au.

Publication of submissions

The ACMA publishes submissions on our website, including personal information (such as names and contact details), except for information that you have claimed (and we have accepted) is confidential.

Confidential information will not be published or otherwise released unless required or authorised by law.

Privacy

[*Privacy and consultation*](https://www.acma.gov.au/theACMA/About/Corporate/Accountability/privacy-and-consultations) provides information about the ACMA’s collection of personal information during consultation and how we handle that information.

Information on the *Privacy Act 1988* and the ACMA’s privacy policy (including how to access or correct personal information, how to make a privacy complaint and how we will deal with the complaint) is available at [acma.gov.au/privacypolicy](http://www.acma.gov.au/privacypolicy).

# Endnotes

1. Commercial Radio Annual Listening Summary, January 2019. Based on GfK Radio Ratings Survey 1-8, 2014-18 Accessed at <http://www.commercialradio.com.au/content/mediareleases/2019/2019-01-21-commercial-radio-audiences-at-all-time>. [↑](#endnote-ref-2)
2. DAB+ refers to the digital audio broadcasting plus transmission standard. It is an advanced audio compression technology which enables the broadcast of terrestrial digital radio multiplex services in Australia. [↑](#endnote-ref-3)
3. Commercial Radio Annual Listening Summary, January 2019, above endnote 1. [↑](#endnote-ref-4)
4. Department of Communications and the Arts, *ACMA Review – Final Report* (May 2017). [↑](#endnote-ref-5)
5. Department of Communications and the Arts, *Spectrum Review Report* (May 2015). [↑](#endnote-ref-6)
6. In its submission to the Digital Platforms Inquiry, the ACMA noted that ‘Despite the scale of change and its far-reaching impact, the ACMA considers that many of the existing communications and media public policy objects that underpin the currently regulatory framework remain highly relevant in digital services.’ See ACMA submission to the *Digital Platforms Inquiry* (2018), p.10. [↑](#endnote-ref-7)
7. *ACMA Review – Final Report* (May 2017), pp.77*–*78. [↑](#endnote-ref-8)
8. The ACMA notes the recommendation of the Expert Panel inquiring into the competitive neutrality of the national broadcasters that ‘issues to do with technical regulation, especially licence areas, have not been fundamentally reviewed since their inception in the 1930s. The Panel has referred these issues to the Department for further policy consideration.’ See: Department of Communications and the Arts, *Inquiry into the Competitive Neutrality of the National Broadcasters – report by the Expert Panel*, September 2018, p.25. [↑](#endnote-ref-9)
9. ACMA-commissioned survey, May 2018. [↑](#endnote-ref-10)
10. ACMA, *Communications report 2017–18*, February 2019. [↑](#endnote-ref-11)
11. ACMA, *Communications report 2017–18*, February 2019. Data relates Australians aged 18 and over who listened to the radio in the previous seven days (over the 12 months to June 2018). [↑](#endnote-ref-12)
12. Commercial Radio Australia, Media release, 21 January 2019. [↑](#endnote-ref-13)
13. ACMA, *Communications report 2017–18*, February 2019. [↑](#endnote-ref-14)
14. Ibid. [↑](#endnote-ref-15)
15. ACMA, Radio in the bush–A study of radio listening in remote Western Australia, May 2017. [↑](#endnote-ref-16)
16. Commercial Radio Australia, Media release, 21 January 2019. [↑](#endnote-ref-17)
17. Commercial Radio Australia, Media release, 12 March 2018. [↑](#endnote-ref-18)
18. For a list of cars with in-built Bluetooth technology as at November 2010: https://www.caradvice.com.au/92836/new-cars-in-australia-with-wireless-bluetooth-audio-streaming/ In Australia, the new Ford Focus has built-in Wi-Fi hotspot capability: https://www.news.com.au/technology/innovation/motoring/motoring-news/new-ford-focus-gets-price-rise-threecylinder-engine-and-more-safety-tech/news-story/2f1ff9375d7c9053ce750e457d3c92aa. [↑](#endnote-ref-19)
19. For data on audio sources used in cars, see: Commercial Radio Australia, ‘Audio sources used in car in Australia’, *The Infinite Dial Australia 2018*, p.24. [↑](#endnote-ref-20)
20. An exact figure is not available. However, the ABS [Motor Vehicle Census (January 2018)](http://www.abs.gov.au/ausstats/abs%40.nsf/mf/9309.0) reports a total of 19,173,279 motor vehicles (ABS) at 31 January 2108. The average age of all vehicles registered in Australia was 10.1 years, unchanged since 2015.  According to [Digital Radio Plus](http://www.digitalradioplus.com.au/dab-in-vehicles), 564,318 vehicles with DAB+ were sold in 2018, as at September. The cumulative sales of vehicles sold with DAB+ digital radio is 1,987,475 as at September 2018. The ACMA’s own analysis contends that based on these figures, if all the vehicles sold with DAB+ are still registered, almost 3 per cent of Australia’s 19 million car fleet could have DAB+. [↑](#endnote-ref-21)
21. ABS [Motor Vehicle Census (January 2018)](http://www.abs.gov.au/ausstats/abs%40.nsf/mf/9309.0). [↑](#endnote-ref-22)
22. The infrastructure base of the commercial radio industry is supported by an extensive radiofrequency transmission tower network. The 262 BSB licences are provided through 613 transmitters – 125 for AM services and 488 for FM services. In recent times, AM-FM conversions have been planned or completed in 33 markets. [↑](#endnote-ref-23)
23. Commercial digital radio services in Hobart are expected to commence in 2019. [↑](#endnote-ref-24)
24. See GFK, Radio Survey 7 2018, http://www.radioalive.com.au/Surveys/Metropolitan-Surveys/2018; Commercial Radio, ‘Record numbers listen to commercial’, Media Release, 29 January 2018. [↑](#endnote-ref-25)
25. ACMA, *Communications report 2016-17*, p.37. [↑](#endnote-ref-26)
26. The sector operates 30 networks across 261 broadcasting services band (BSB) content licences and 13 non-BSB services, servicing the public through 107 commercial radio licence areas, 6 metropolitan, 98 regional and 3 remote licence areas. There are 68 ‘solus’ regional markets with 1 or 2 stations owned by same licensee. For a list of network group companies, see: ACMA, *Communications Report 2016–17*, p.38. [↑](#endnote-ref-27)
27. The ABC’s services are delivered via 707 radio transmitters, 110 providing AM services and 597 providing FM services. [↑](#endnote-ref-28)
28. Retransmission services do no more than retransmit programs that are transmitted by a national, commercial or community broadcasting service. [↑](#endnote-ref-29)
29. See GFK, Radio Survey 7 2018, http://www.radioalive.com.au/Surveys/. [↑](#endnote-ref-30)
30. The community sector is comprised of 357 licensed community radio BSB content licences. It transmits via a network of 415 transmitters, with 13 delivering AM services and 402 delivering FM services. There are 101 temporary community broadcasting licences delivered via a network of 134 transmitters, comprising 1 transmitter for AM services and 133 transmitters for the delivery of FM services. [↑](#endnote-ref-31)
31. An interactive map showing the extent of indigenous broadcast services is available from the First Nations Media website: https://firstnationsmedia.org.au/our-industry/radio-services. [↑](#endnote-ref-32)
32. Low power open narrowcasting services are all FM services - almost all are on 87.5 or 88 MHz. [↑](#endnote-ref-33)
33. High power open narrowcasting services tend to be FM services, but a large number are AM services. [↑](#endnote-ref-34)
34. ACMA, *Communications report 2017–18*, February 2019. [↑](#endnote-ref-35)
35. For example, http://www.commercialradio.com.au/content/mediareleases/2017/2017-05-22-radioapp-now-on-apple-carplay-and-andro [↑](#endnote-ref-36)
36. Australian Communications and Media Authority, *AM radio issues: An examination of technical and engineering issues, their impact on the AM radio business model, and digitalisation*, January 2006, p.14. [↑](#endnote-ref-37)
37. ACMA, *Communications report 2017–18*, February 2019. [↑](#endnote-ref-38)
38. ACMA broadcasting financial reports, financial year 2001 to 2016. [↑](#endnote-ref-39)
39. Wide coverage in this context means the ability of an AM radio signal to travel further than other transmission technologies. The area covered by a signal emanating from an AM broadcasting station is related to the frequency of the signal. [↑](#endnote-ref-40)
40. A ‘solus’ market is a non-competitive market where there is only one incumbent commercial licensee and no more than 30 per cent population overlap with any adjacent licence area. [↑](#endnote-ref-41)
41. Australian Communications and Media Authority, *ACMA’s approach to AM–FM conversions and infill transmitters for commercial radio broadcasting services* (2017). [↑](#endnote-ref-42)
42. See statistics on page 3. See also: Commercial Radio Australia, ‘Digital rollout continues with 3.8m DAB+ radios in market’, *Media Release*, 12 March 2018, http://www.commercialradio.com.au/content/mediareleases/2018/2018-03-12-digital-rollout-continues-with-3-8m-dab. [↑](#endnote-ref-43)
43. For example: https://www.radioinfo.com.au/news/ford-innovations-put-pandora-and-digital-radio-new-cars; and Apple’s carplay: https://www.apple.com/au/ios/carplay/. [↑](#endnote-ref-44)
44. AM uses medium frequency (MF) spectrum while FM (and DAB+) use very high frequency (VHF) spectrum. [↑](#endnote-ref-45)
45. Australian Communications and Media Authority, *Five year spectrum outlook 2018**–22 – six monthly report* (2019), p.5. [↑](#endnote-ref-46)
46. Australian Communications and Media Authority, *Five year spectrum outlook 2018–22* (September 2018), p.15. [↑](#endnote-ref-47)
47. See https://radiotoday.co.uk/2016/01/a-number-of-am-services-turned-off-in-europe/; https://www.radioinfo.com.au/news/am-radio-dead-europe. There are still AM services operating in Germany but no German language services. Europe 1 is a long wave transmitter on 183 kHz that is in Germany near the French border and transmits a French language program. See: http://www.saar-nostalgie.de/EuropeNo1.htm. [↑](#endnote-ref-48)
48. See: https://www.rbr.com/farewell-bbc-mw-stations/ [↑](#endnote-ref-49)
49. For example, Absolute Radio’s application to Ofcom to switch-off its AM services, https://absoluteradio.co.uk/listen/am-changes-2018.html. [↑](#endnote-ref-50)
50. See: Federal Communication Commission*, AM Revitalization*, https://www.fcc.gov/media/radio/am-revitalization. [↑](#endnote-ref-51)
51. Ofcom*, Digital Radio Report 2017*, p.3. https://www.ofcom.org.uk/\_\_data/assets/pdf\_file/0014/108311/Digital-Radio-Report-2017.pdf [↑](#endnote-ref-52)
52. Ofcom, ibid, p.4. [↑](#endnote-ref-53)
53. ‘Norway becomes first country to end national radio broadcasts on FM’, *The Guardian*, 14 December 2017. [↑](#endnote-ref-54)
54. See: M Clark, ‘EU Parliament says ‘yes’ to in-car digital radio’, *Radio World*, 15 November 2018, https://www.radioworld.com/news-and-business/eu-parliament-says-yes-to-in-car-digital-radio. [↑](#endnote-ref-55)
55. Scenario testing is an established method for analysing future events and outcomes in a range of contexts. For example: see Australian Communications Authority*, Vision 20/20: Future Scenarios for the Communications Industry – Implications for Regulation*, April 2005; F Smith, A Sinpeng, R Holz, S Logan, J Hutchinson and H Xue, *Australia’s cybersecurity futures(s)*, Australian Strategic Policy Institute, 13 December 2018. [↑](#endnote-ref-56)
56. See Australian Communications and Media Authority, *ACMA’s approach to AM–FM conversions and infill transmitters for commercial radio broadcasting services* (2017). [↑](#endnote-ref-57)
57. The ACMA considers LAP variation requests for AM to FM conversion in a manner that is consistent with the exercise of its obligations in relation to broadcasting planning pursuant to Part 3 of the BSA. [↑](#endnote-ref-58)
58. The first AM to FM conversion was completed with the commencement of the 6NW Port Hedland FM transmitter on 22 December 2017 and the cessation of its AM transmitter on 19 January 2018.Other markets that have been converted include Bathurst (NSW), Warnambool (Victoria), Karratha and Mandurah (WA), and Exmouth, Paraburdoo and Tom Price (Remote WA), Burnie, Devonport and Queenstown (Tasmania). For up to date information see: https://www.acma.gov.au/Industry/Broadcast/Spectrum-for-broadcasting/Licence-area-plans/am-fm-conversions-and-infill-transmitters-for-commercial-radio-broadcasters. [↑](#endnote-ref-59)
59. Achieving a 50 dB audio signal to noise ratio is very high standard. [↑](#endnote-ref-60)
60. See also the proposal to remove the concept of the broadcasting services bands under the spectrum reform proposals: Department of Communications and the Arts, *Broadcasting spectrum consultation paper* (May 2017), p.11. [↑](#endnote-ref-61)
61. Department of Communications, *Digital Radio Report* (2015), p.12. [↑](#endnote-ref-62)
62. RAJAR Midas Audio Summary, Summer 2017, https://www.rajar.co.uk/docs/news/MIDAS\_Summer\_v2.pdf. [↑](#endnote-ref-63)
63. For example, both SBS and ABC have developed radio listening apps. [↑](#endnote-ref-64)