Opinion: The Future of AM Radio

England, Scotland, Wales and Northern Ireland

Summary

AM radio in the British Isles is now in terminal decline and may be discontinued completely during the mid-to-late 2020s. With the BBC subject to budget cuts and commercial stations vulnerable to a potential advertising recession, all broadcasters will be looking to reduce their AM transmission costs. Inevitably, those stations with a relatively small proportion of their listening via AM are likely to close their AM transmitters before those stations with much larger AM audiences. This article explores how this process could be managed smoothly so that AM transmission costs are gradually reduced in proportion to the number of listeners continuing to use AM.

For high-power transmitters, substantial cost savings can be made by simply reducing the transmission power. A 50% power reduction would have minimal impact on audience size. For low-power transmitters, there are two issues to consider: the size of the audience for each transmitter and the number of transmitters operating at that site. The more low-power transmitters that share a site, the lower the operating cost per transmitter. Thus, closure decisions should be based on cost per AM listener and coordination between different broadcasters is needed. With 26 AM transmitters closed during 2018 and at least 24 closing during 2020, this process has now begun.

Background

AM was the dominant listening medium for radio in the British Isles until the mid 1980s, when it was overtaken by FM. In the early 1990s, with improvements in FM coverage and wide access to FM radios, it was decided to mostly abandon simulcasting in the UK and launch new stations on AM. In general, the most popular stations have broadcast on FM since the 1990s, while AM has been used for more specialist services. Five Live, Talk Sport and many of the minority stations have remained successful. However most of the music stations have lost more than half of their audience as more commercial stations have launched on higher quality FM and Radio 2 has broadened its appeal.

With the widespread adoption of digital radio in the UK, the decline in listening to ‘AM’ stations has halted and their audience has stabilised. However, the proportion of that audience that is still using AM is declining. In 2017, about 49% of listening to Talksport and 43% of listening to BBC Five Live was on AM. However, only about 12% of listening to Absolute Radio was via AM, noting that Absolute is far more popular in the London area, where it is available on FM. AM radio listening is now substantially less than that via DAB and FM and has now been overtaken by listening via internet protocol. Many new radios cannot receive AM. With DAB now standard in the majority of new cars, AM listenership is likely to halve between 2018 and 2025.

AM transmitters are more expensive to run than FM and DAB transmitters (though hilly areas can be served by fewer transmitters on AM). There are two reasons for this. Firstly, the electricity costs are around ten times higher than FM and DAB because high-gain transmit antennas are not practical at the wavelengths AM radio operates on. Secondly, AM radio generally uses separate transmission sites, whereas FM and DAB radio share transmission masts with each other, with television and with mobile communications services. Even where AM does share a site with FM and DAB, a separate mast is usually required. AM transmitter sites also require more land as discussed in Appendix B.

Many European countries, such as Austria, Belgium, Germany, Sweden and Switzerland, have closed AM radio completely. Many other countries have substantially reduced the number of transmitters in use.

The Problem

Clearly, AM radio is in decline and audiences will continue to drop. If nothing is done, the transmission cost per AM listener will likely double over the next five years and double again over the following five years. Thus, in the long term, AM transmission will cease to become economically viable. In practice, different stations will reach the limit of economic viability at different times. Particular problems can occur when investment in new transmission equipment is needed or a site lease has expired, requiring relocation of the transmitter in order to continue broadcasting. The highest transmission costs per listener are borne by Absolute Radio and some of the Smooth and Greatest Hits stations, while Five Live and Talksport have the lowest cost per listener.

At some point, stations will have to close down AM and expect the remaining AM listeners to switch to digital radio. DAB coverage is now sufficient for many commercial stations, though not for the BBC, which is obliged to provide close to universal coverage. For home listening, switching from AM to digital platforms is relatively straightforward, with television and internet listening providing an alternative to DAB. Outdoor listening using DAB is possible in
most places. Battery life can be poor, but this is likely to improve with the next generation of receivers. The problem is in-car listening, where it is difficult to replace the radio. In the early 1990s when many stations became FM only, car radios conformed to a standard fit and were easy to exchange. Now, the radio is integrated into the car dashboard. One possibility is a stand-alone DAB radio that either connects to the car using the jack connection provided for MP3 players or incorporates a low-power FM transmitter. However, providing an adequate aerial for the DAB receiver can be problematic. Many listeners will simply switch to another station instead. Norway kindly volunteered to act as a test-bed for in-car DAB installation by switching off its national FM transmitters in 2017. A few months after the FM transmitters were switched off, only a third of drivers of cars without DAB before the switch off had installed DAB receivers with the result that nearly half of Norwegian cars were unable to receive national radio.

The fundamental problem that stations in the UK face is that if they switch off AM early, they will lose a significant proportion of their audience, whereas if they keep it going for several more years, they will be spending money broadcasting to a shrinking audience.

The Solution

The best approach for the next 5-10 years is therefore to follow the example of many other countries by reducing the cost of AM transmission, whilst trying to minimise the number of listeners lost as a result. If coverage is reduced gradually, sudden drops in the overall audience (i.e., across all platforms) will be avoided. A good strategy could be to try to keep the transmission cost proportional to the number of AM listening hours as the latter declines.

For high-power AM transmitters, electricity costs form a large proportion of the operating costs. Therefore, simply halving the power of these transmitters would significantly reduce transmission costs without completely cutting off any listeners. Some would simply experience more background noise. Arqiva revenue would not be affected by this as electricity costs are “passed through” from the electricity suppliers to the broadcasters.

For low-power transmitters, the cost of distributing the audio to the transmission site is significant. For national FM networks, distribution costs are minimized by using the high-power transmitters to feed the low-power transmitters. This works because good reception of at least one high-power transmitter is usually available on top of a relay station tower with a good aerial. This doesn’t work for AM because reception of other AM transmitters carrying the same programme is generally poor at transmission sites. Some of the Absolute Radio transmitters have been fed by satellite since they were commissioned in the 1990s as this was cheaper than installing new line feeds. Now, all BBC AM transmitters, together with Absolute Radio and Talksport’s transmitters are satellite fed. This could be extended to other stations. Arqiva is also replacing its audio line feeds with an internet protocol (IP)-based system, which will enable services using a given transmission site to share a distribution feed, reducing the operating cost. Another option to consider is feeding AM transmitters from the corresponding DAB transmissions to minimise costs.

Transmission costs can also be reduced by closing transmitters. In general, those transmitters with the smallest audiences should be closed first, noting that audiences do not necessarily correspond to coverage areas. For example, AM audiences will generally be lower where there is a direct competitor on FM. However, transmitters typically cost less to operate where the transmission site is shared with other broadcasters, particularly other AM transmitters, but also FM, DAB and TV transmitters. The high-power AM transmission sites could also potentially be used to transmit low-frequency timing and navigation signals. Thus, it can be more cost effective to shut down solo transmission sites even if the affected audience is slightly larger. Sites that require extensive maintenance work are also likely to be closed earlier. Appendix A lists commercial radio and Radio 5 Live AM transmitters (or groups thereof) by estimated cost per listener. Another issue is land value; some AM transmission sites have substantial redevelopment value and it is no longer cost effective to relocate the transmitter(s). This is explored in Appendix B.

Clearly, a plan for gradual reduction of AM coverage will require cooperation between the broadcasters, Arqiva and Ofcom. Absolute Radio and Talksport would need their AM broadcast licenses amended to allow reduced coverage. This also applies to local stations with more than one transmitter. Operators of local station networks will also want to avoid any AM broadcast licenses that they surrender being re-advertised. However, this is unlikely in practice as if an AM service is not commercially viable for the current operator (who will typically be operating FM and DAB stations in the same area), it is unlikely to be viable for a newcomer. Arqiva would also wish to coordinate the closure of different transmitters at the same site where possible.

A further option is for the national stations to close their high-power AM transmitters between midnight and 6AM (as Radio 1 did between 1991 and 1994). This would save electricity costs, though it would be less than 25% as electricity is available more cheaply overnight. To make efficient use of transmitter operating staff, it may be necessary for all three national medium wave stations to introduce this measure at the same time. Absolute and Talksport would also need permission from Ofcom to do this.
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BBC Local and Regional Radio

In 2012, the BBC announced plans to close down most of its remaining local radio AM transmitters in England, noting that many were closed down in the 1990s to make way for commercial radio expansion. Only Radios Cumbria, Derby, Gloucestershire, Guernsey and Jersey were to remain on AM, noting that the two Channel Islands stations have opt-out programming on AM. Several transmitters were temporarily closed to determine how many listeners relied on them. The BBC’s AM radio transmission contract with Arqiva is due for renewal in 2020, but its terms allow local radio transmitters in England to be switched off before then. With the improvements in local DAB coverage and the rollout of BBC local radio onto the terrestrial TV platform during 2015-16, most people have a free-to-air alternative to AM for indoor listening. Just over half of cars still rely on AM for areas where the FM transmissions cannot be received. However, car radios can work with a weaker FM signal than radios indoors.

Radio Nan Gaidheal’s AM transmitter in Aberdeen was closed in November 2015 and Radio Bristol’s AM transmitter in February 2016, the latter to enable redevelopment of the transmission site. The following transmitters were then switched off in January 2018:

- Radio Devon – Torbay
- BBC Essex – Southend
- Radio Humberside
- *Radio Kent – East
- R Kent – Tunbridge Wells
- Radio Lancashire – Lancaster
- Radio Lincolnshire
- *Radio Nottingham
- BBC Surrey
- *BBC Sussex – Brighton

The following transmitters were switched off in early 2020:

- *R Cornwall – Mid Cornwall
- Radio Cornwall – West
- Radio Cumbria – Whitehaven
- *Radio Merseyside
- Radio Newcastle
- *Radio Norfolk – East
- *Radio Solent – Bournemouth
- *Radio Solent – Hampshire
- *Three Counties R – Bedford
- *Three Counties R – Main
- Radio Wales – Mid Powys
- *Radio Wales – North Powys
- *Radio Wales – West
- *Radio York – Main
- *Radio York – Scarborough

For those transmitters marked with an asterisk above, the AM switch-off has affected areas with poor FM and/or DAB coverage as detailed in Appendix C. Some major towns have been left with a combination of weak FM reception and good DAB reception. However, those areas left with no FM or DAB reception are generally small populations (fewer than 2000 people) that were on the edge of the AM service area. Thus, the AM service in these areas would have been subject to interference from foreign stations during hours of darkness and vulnerable to local electrical interference at all times.

In addition, the Radio Scotland Aberdeen and Dumfries transmitters are due to be switched off in mid 2020.

No firm switch-off dates have been set for the remaining local transmitters, which may be divided into three groups. For the first group, areas of weak FM and DAB reception are not substantially greater than for those AM transmitters that have switched off already. These are:

- Radio Cambridgeshire
- Radio Cumbria – North (after local DAB launches)
- Radio Cumbria – South
- R Foyle/Ulster – Derry
- Radio Guernsey
- Radio Jersey
- Radio Leeds
- Radio Norfolk – West
- Radio Sheffield

Note that the Radios Guernsey and Jersey AM transmitters cannot be switched off until after the assembly coverage they carry part-time becomes available on DAB at the end of 2020.

For the second group, the extent and importance of gaps in FM and DAB coverage is unclear. Enhancements to DAB or FM coverage may or may not be needed before these AM transmitters are switched off. These are:

- BBC Essex – North East
- Radio Lancashire – Main
- Radio Scotland – Central
- Radio Scotland – North
- Radio Stoke-on-Trent
- Radio Ulster – Enniskillen
- Radio Wales – North
- Radio Wales – South
- Radio Wales – Wrexham
The third group of transmitters serve areas with more substantial gaps in FM and DAB coverage. Thus, enhancements to DAB or FM coverage are likely to be needed before these AM transmitters are switched off. These are:

- Radio Derby
- Radio Devon – East Devon
- Radio Devon – North Devon
- BBC Essex – Main
- Radio Gloucestershire – East
- Radio Gloucestershire – West
- BBC Hereford and Worcester – North
- BBC Hereford and Worcester – Worcestershire
- BBC Somerset
- Radio Ulster – Main

The relevant FM and DAB coverage gaps for all three groups of transmitters are detailed in Appendix D. In a few cases, FM transmitters could be reallocated from Radio 3 to local services, as has been done in Wales.

Local Commercial Radio

Between 2015 and 2020, AM transmitters in Aberdeen, Berkshire and Bristol were closed due to site redevelopment, but none of the major radio groups have closed local radio transmitters due to operating costs. As AM audiences decline, this is likely to change. Most AM broadcast licences for local commercial radio expire between the end of 2019 and the end of 2021. Many of the associated transmission contracts will expire at the same time. At this point, some stations may decide to discontinue AM broadcasting, while others are likely to continue. Closures are more likely to occur where site leases expire and/or new transmission equipment is needed. This is difficult to predict without access to proprietary information. Arqiva may also offer early termination when other transmitters at the same site close. The stations that continue will be offered a 4-5 year automatic AM licence extension, provided they also broadcast on DAB. Their AM audiences are likely to halve over this period and also grow older, making them less attractive to advertisers. Thus, further AM transmitter closures are likely to occur between 2023 and 2026. In general, those stations with a lower transmission cost per listener (see Appendix A) are likely to continue on AM for longer.

The closure of a number of BBC local radio and Absolute Radio transmitters will impact local commercial radio in two main ways. It will increase the transmission costs for those services remaining at sites where another service has closed. However, it will also open opportunities for other services to take over abandoned transmitters at shared sites and close their existing solo sites, reducing transmission costs. In some cases, the ex-BBC frequency would have to be used to avoid interfering with other services. The main opportunities are as follows:

- Radio City Talk could move from Bebington to Wallasey when Radio Merseyside leaves AM;
- Metro Radio 2 could move from Greenside to Wrekenton when Radio Newcastle leaves AM;
- Viking 2 could move from Goxhill to Hull now Radio Humberside has left AM;
- Smooth East Anglia could move from Brundall to Postwick when Radio Norfolk leaves AM;
- Smooth Solent could move from Farlington Marshes and Veals Farm to Fareham when R Solent leaves AM.

Sunshine Radio in Ludlow currently broadcasts on both AM and FM. However, improvements in FM coverage are planned for 2020, after which the AM transmitter is likely to close.

The transmitters in Birmingham, Wolverhampton and Shropshire reallocated to Absolute Classic Rock from Free Radio 80s in January 2019 are likely to close when their current broadcast licences expires at the end of 2020 unless Absolute Classic Rock achieves a substantially higher audience.

Absolute Radio

Absolute Radio has the highest transmission cost per listener of any major AM radio station and also the highest proportion of digital listening. Absolute is available on FM in the London area. Other rock or rock-led music stations are available on FM in Central Southern England, Bristol, Swindon, Oxford and Manchester. Thus, AM listening to Absolute will be highest in those areas without a rock music station on FM.

From a purely commercial perspective, it would thus make sense to close AM in areas where Absolute or another rock station is available on FM and retain AM elsewhere for the time being. This could halve the transmission cost per AM listening hour. However, Ofcom would be unlikely to permit this because there is a legal requirement to provide national coverage and a transmission network that excluded London and several other major cities would not meet this definition. Absolute closed its Reading transmitter in 2015 when the site was sold and closed a transmitter at Gatwick several years before. Under the terms of its 2011–18 broadcasting licence, Absolute was also permitted to close transmitters at Dundee, Sheffield, Stoke, Boston, Manningtree, Hoo, Lydd, Guildford, Swindon, Gloucester and Redtruth.
Absolute Radio’s AM broadcast licence has been renewed until 30 April 2022 and Ofcom have approved closure of 12 transmitters, together with power reductions at a further 5 transmitters. The Redmoss (Aberdeen), Dundee, Wallasey (Merseyside and North Wales), Sheffield, Hull, Cambridge, Hoo (Kent and Essex), Guildford, Swindon, Torbay, Plymouth and Redruth (Cornwall) transmitters closed in May-June 2018. Aberdeen, Plymouth and Cornwall lost AM coverage altogether, while Dundee, Hull & Grimsby, Mid Kent, Torbay and the North Wales Coast now receive only a weak signal. The remaining areas experienced severely degraded night-time reception.

Power reductions of 50% took place at the five high power sites: Westerglen, serving Central Scotland; Moorside Edge, serving Northern England; Droitwich, serving the Midlands; Washford serving South Wales, Avon, Somerset and Wiltshire; and Brookmans Park, serving London and the surrounding counties. Daytime reception was slightly weakened along the edges of each transmitter's coverage area, while night-time reception could be slightly improved in parts of North East England, Northern Ireland, Hampshire and Norfolk where lower power transmitters operate on the same frequency.

The coverage reductions were motivated by Arqiva quoting a much higher price for continuing operation of Absolute’s AM network in the pre-2018 configuration beyond April 2018. This was due to the need to replace much of the transmission equipment. Closing some sites thus reduces the amount of new equipment needed and, together with the power reductions, offsets the cost of procuring the remaining new equipment. These changes reduced the daytime population coverage from 90.5% to 85.4%. However, the additional loss of night-time coverage impacts the evening commute and parts of the morning commute during winter. Furthermore, most of the coverage lost is in areas without a rock music service on FM, where most of the AM listening will take place. Therefore AM listening is likely to drop by 10-15% because of the changes.

Between 2018 and 2022, AM listening to Absolute Radio is likely to drop by about a third as more cars and commercial vehicles become equipped with DAB. However, some FM stations switching from rock music to other formats may offset this slightly. Absolute predicts that the new AM network configuration will cease to be profitable by 2022. Closing a further 10 low-power transmitters would reduce the cost per listener by about 25% and reduce daytime population coverage to somewhere between 70 and 75%. This would likely be permitted by Ofcom. However, it is not possible to reduce the cost per listener by more than about 25% while maintaining daytime population coverage of more than 50%.

The likely options are thus either a complete closure of the AM network on 1 May 2022 or a coverage reduction in 2021-22 followed by complete closure two to four years later.

Talksport

Talksport’s AM listenershhip will be similar in different parts of the country. Therefore, a reduction in transmitter powers and the closure of some low-power transmitters should be a viable way of reducing the transmission cost per AM listener and/or offset any capital investment cost. Ofcom is likely to allow a similar reduction in coverage to that implemented by Absolute Radio. However, as Talksport’s AM audience is much larger, it is likely to want to retain more coverage. Power reductions at Brookmans Park, Droitwich and Moorside Edge would be likely. Reductions at Washford and Westerglen are also possible.

Five low-power sites are now used only by Talksport, following closures of several Absolute Radio and BBC local radio transmitters in 2018. If Talksport wishes to continue broadcasting from these sites, the cost is likely to increase. Most of these transmitters improve night-time coverage in areas that can also receive one of the high-power transmitters. Duxhurst, Hull and Rusthall serve areas where one or two other transmitters can be heard as background echos at night behind the signal from the relevant high-power transmitter (Brookmans Park or Moorside edge). Many listeners will tolerate this, so these sites may well close when Talksport’s AM broadcasting licence is renewed. Alternatively, Hull could also be served from the Goxhill site, used for Viking 2. Clipstone serves an area where there is night-time interference between the ground wave and sky wave from the strongest high-power transmitter, which results in intermittent distortion that few listeners will tolerate. Talksport will therefore need to make a commercial decision as to whether to retain this. The final transmitter, at Torbay, transmitter serves an area where daytime reception from the high-power transmitters is poor, so will probably be retained unless the power of the neighbouring Exeter transmitter is substantially increased. Moving the transmitter from its current site at Occombe to the Beacon Hill FM/DAB/TV site would potentially save money. In addition, the Dumfries, Londonderry, Redruth and Rosemarkie transmitters could close due to the small populations they serve. The Dundee, Exeter and Wallasey transmitters also improve night-time coverage in areas that can also receive one of the high-power transmitters, though Wallasey serves a large population. The other Talksport transmitters are likely to continue at least until the current broadcasting licence expires at the end of 2022.
At the beginning of 2020, Ofcom granted permission to Talksport to close of the Exeter, Londonderry, Occombe, Redruth and Rosemarkie discussed above, plus the Plymouth and Redmoss (Aberdeen) transmitters. Power reductions for the main transmitters were not proposed.

It is likely that Talksport will want to continue on AM beyond 2022. However, the high-power transmission sites will only be viable if the BBC continues to use them. Otherwise, Talksport will have to switch to alternative sites, which will only support lower-power transmitters and thus provide less coverage. These would be a mixture of sites used by continuing local AM services and high-power FM/DAB/TV sites which have tall enough masts to support an AM antenna. For example, the Crystal Palace site in London already hosts 2 AM transmitters.

**BBC Radio 4 Long Wave**

For the past few years, the BBC’s long wave transmitters (but not the MW transmitters) have been partially funded by the electricity industry in order to provide the Radio Teleswitch Service, which uses phase information in the long wave transmissions to switch ‘Economy 7’ electricity meters between day and night modes. Due to delays in smart meter installation, the contract for this has been extended for a year until 31 March 2021. Further extensions are possible. However, once the Radio Teleswitch Service ends, it is likely that the Radio 4 Long Wave network (including the MW transmitters) will close.

The long wave transmitter at Burghead, serving Northern Scotland, and the associated medium wave transmitters could potentially be closed early; this is permitted under the BBC’s contract with Arqiva. The MW transmitters in London, Plymouth and Cornwall supplement weaker LW reception, which is more important after dark. However, as separate programmes (from FM) are rarely broadcast in the evenings, there is arguably no need for them. In Northern Ireland, North East England and Aberdeen, multiple LW transmitters can be received. These cause mutual interference in cars, which use a whip antenna. However, other radios, which use a ferrite rod antenna, can be rotated to select one transmitter or the other. Audiences for the Enniskillen and Londonderry transmitters are likely to be very low. The LW transmitters are also synchronized to minimize interference effects in Newcastle and Aberdeen. The Carlisle MW transmitter may have to be maintained as the two LW transmitters receivable there are ~180° apart.

**BBC Radio Five Live**

The BBC’s AM transmission contract with Arqiva is due to be renewed in 2020. If it continues with its present format, Radio Five Live is likely to continue broadcasting on AM beyond this, serving areas with inadequate DAB reception and cars and commercial vehicles without DAB. Final closure is likely to happen at some point during the mid to late 2020s. However, if the BBC change the format of the station, potentially due to budget cuts, it may choose to make it digital only from that point.

If the BBC decides to maintain Five Live’s AM service in the medium term, there is considerable scope to reduce costs with minimal reduction in coverage, noting that the BBC is a public service broadcaster. Any capital expenditure required to maintain the BBC’s AM and FM services will need to be offset by cuts, most likely to AM provision, as the BBC is unlikely to accept any increase in its overall analogue radio transmission bill.

The powers of the high-power transmitters could be halved as indoor coverage is less important than outdoor now that Five Live is widely available on DAB and via digital TV. The network could also be reconfigured so that transmission sites are shared with other services wherever possible. Four transmission sites are currently used by Five Live alone: Folkestone, Stagshaw, Clevedon and Start Point. These will soon be joined by Tywyn and Whitehaven when the local BBC services close there. Folkestone is a low power site serving South East Kent. In Kent, Five Live could move to the Littlebourne site, formerly used by Radio Kent, which is shared with Smooth Radio, potentially using the old Radio Kent frequency to avoid causing interference to Postwick reception in North East Essex. Alternatively, Folkestone could simply be closed as daytime coverage is available from Brookmans Park.

The Stagshaw high-power transmitter serves North East England and could potentially be replaced by low-power transmitters at Newcastle Wrekenton and Carlisle. When Radio 4 Long Wave closes, Five Live could take over its transmitters at these sites and close Stagshaw. Absolute and Talk Sport also serve Teeside from a transmitter at Stockton. However, Wrekenton may provide adequate coverage of Teesside on 603 or 693 kHz as signals travel further on these frequencies than on the higher frequencies used by Absolute and Talksport. This change would however degrade reception in parts of North West Northumberland where DAB reception is poor.

The Clevedon high-power transmitter serves Bristol, Somerset, Wiltshire and South Wales. Absolute and Talksport serve this area from the Washford site. However, Washford cannot be used on 909 kHz because of the Radio Wales transmitter on 882. In principle, 720 kHz, once relinquished by Radio 4 LW, could be used instead at up to 10 kW, while a number of other frequencies in the low frequency part of the medium wave band could be used at up to 2
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kW. However, the costs of installing an additional transmitter at Washford could wipe-out the savings from closing the Clevedon site. Instead, it may be cheaper to wait until Absolute eventually closes its AM service and then use its transmitter and frequency at Washford. Moving Start Point to 909 kHz would also improve reception of the Droitwich transmitter within Clevedon’s coverage area.

The Start Point transmitter serves Devon, Cornwall and Dorset. It will need to be retained as switching coverage to the low-power sites in the South West is no longer viable now that other services are being withdrawn from these sites. However, closure of some of the low-power fillers should be possible as the signal from Start Point is no longer subject to night-time interference from Germany on 693 kHz. The feasibility of closing Bournemouth, Exeter and Redruth should be investigated. In particular, the Redruth site is unlikely to remain viable due to the withdrawal of other services.

Whitehaven and Tywyn provide night-time coverage to West Cumbria and the Cardigan Bay area of Wales, respectively. Daytime reception from the main transmitters should be sufficient in these areas, noting that the Lisnagarvey transmitter in Northern Ireland should be receivable in West Cumbria.

Finally, the BBC should also consider whether Five Live’s audience in Northern Scotland is sufficiently large to justify continuation of the high-power transmitter at Burghead, a site also used by Radio Scotland. The same potentially applies to the Londonderry and Enniskillen sites in Northern Ireland. The Barrow transmitter could also be potentially be closed if daytime reception from the main transmitters is sufficient there.

**AM Only Stations**

A few stations still broadcast on AM only. Many of these are community stations that are likely to join small-scale DAB multiplexes once the opportunity arises.

However, another group of stations stuck on AM are those on low-power AM (LPAM) restricted service licences (RSLs), including many hospital radio stations. These stations broadcast over a much smaller area than community radio stations, so are not suited to the new small-scale DAB multiplexes. However, their small coverage area means that they could be allocated FM frequencies that are unsuitable for community radio. Thus, these stations should be moved to FM as soon as possible. Ofcom issued low-power FM licenses for three of these stations in 2019; presumably, more will follow.

*Paul Groves. August 2015*

*Last updated: May 2020.*
### Appendix A: AM Transmitters ordered by Estimated Cost per Listener

| Radio 5 Live Tywyn | £2.5
| Absolute Radio Gloucester | £3.9
| Absolute Radio Oxford | £4.9
| Radio 5 Live Exeter | £5.9
| Radio 5 Live Whitehaven | £6.9
| Talksport Dumfries | £7.9
| *Radio 5 Live Bergha | £8.9
| Smooth Hampshire (2 transmitters) | £9.9
| Greatest Hits S Yorks (3 transmitters) | £8.8
| *Radio 5 Live Folkstone | £8.8
| Absolute Radio Manningtree | £8.3
| Greatest Hits R Coventry | £8.2

**High Cost per Listener**

| Radio 5 Live Redruth | £8.0
| Absolute Radio Linsagarve | £7.3
| Greatest Hits Radio Manchester | £7.0
| Talksport 2 (2 transmitters) | £6.5
| Absolute Radio Bournemouth | £6.4
| Absolute Radio Northampton | £6.4
| Smooth Herts & Beds (2 transmitters) | £6.4
| *Radio 5 Live Bexhill | £6.3
| Greatest Hits Radio Tyne & Wear | £6.3
| Absolute R Classic Rock Birmingham | £6.1
| Radio 5 Live Enniskillen | £6.1
| *Radio 5 Live Londonderry | £6.0
| *Absolute Radio Brookmans Park | £5.9
| Smooth Suffolk (2 transmitters) | £5.8
| Greatest Hits Radio Lancashire | £5.8
| Absolute Radio Boston | £5.5
| Smooth Plymouth | £5.5
| Talksport Dunsden | £5.3
| *Absolute Radio Washford | £5.2
| West Sound AM | £5.0
| *Absolute Radio Droitwich | £4.8
| Pulse 2 (2 transmitters) | £4.8
| Smooth Kent (2 transmitters) | £4.8
| Absolute Radio Postwick | £4.5
| Absolute Radio Stockton | £4.5
| Talksport 2 (2 transmitters) | £4.3
| Absolute Radio Brighton | £4.2
| Smooth Gloucestershire | £4.2

**Medium Cost per Listener**

| Talksport Rushall | £3.9
| Smooth Essex (2 transmitters) | £3.9
| Smooth Sussex (2 transmitters) | £3.9
| Absolute Radio Lydd | £3.9
| Smooth Wiltshire (2 transmitters) | £3.9
| *Radio 5 Live Start Point | £3.8
| Absolute Radio Trowell | £3.7
| *Lyca Radio 1438 | £3.7
| Greatest Hits Radio Leeds | £3.6
| *Talksport Clifton | £3.6
| *Talksport Duxhurst | £3.6
| *Talksport Hull | £3.6
| Smooth Norfolk | £3.5
| *Absolute Radio Westerglen | £3.5
| MFR 2 | £3.5
| Greatest Hits Radio Teeside | £3.4
| Radio 5 Live Bournemouth | £3.4
| Greatest Hits Radio Humberside | £3.4
| Absolute Radio Fareham | £3.3
| Gold Northamptonshire | £2.9
| Smooth South Wales (2 transmitters) | £2.9
| Swansea Sound | £2.9
| Radio City Talk | £2.9
| Smooth Dorset | £2.7
| Absolute Radio Newcastle | £2.6
| Radio 5 Live Aberdeen | £2.5
| Radio 5 Live Barrow | £2.5
| Gold Manchester | £2.4
| Talksport Linsagarve | £2.3
| *Talksport Droitwich | £2.2
| Talksport Lydd | £2.2
| *Talksport Westerglen | £2.2
| Talksport Bournemouth | £2.2
| *Talksport Moorside Edge | £2.1
| Talksport Boston | £2.1

**Low Cost per Listener**

| Gold East Midlands (2 transmitters) | £2.0
| Smooth Wrexham | £1.9
| Downtown Radio Belfast | £1.9
| Forth 2 | £1.9
| *Talksport Washford | £1.8
| Talksport Postwick | £1.8
| *Radio 5 Live Cheaden | £1.8
| Gold Cambridgeshire | £1.8
| Clyde 2 | £1.7
| Talksport Brighton | £1.7
| *Absolute Radio Moorside Edge | £1.7
| *Radio 5 Live Westerglen | £1.4
| Talksport Stockton | £1.3
| *Radio 5 Live Slagshaw | £1.3
| Signal 2 | £1.3
| *Radio 5 Live Droitwich | £1.2
| *Talksport Brookmans Park | £1.2
| Radio 5 Live Postwick | £1.2
| *Gold London | £1.1
| Radio 5 Live Brighton | £1.1
| Radio 5 Live Linsagarve | £1.1

**Very Low Cost per Listener**

| *Radio 5 Live Moorside Edge | £1.0
| Sunrise Radio (2 transmitters) | £1.0
| Talksport Fareham | £0.9
| Talksport Newcastle | £0.9
| Talksport Merseyside | £0.9
| Lyca Olise 1035 | £0.9
| Radio 5 Live Fareham | £0.8
| BBC Asian Network (4 transmitters) | £0.7
| *Radio 5 Live Brookmans Park | £0.6
| LBC News | £0.5

**Closed**

| *Absolute Radio Guildford | £27.0
| *Absolute Radio Swindon | £27.0
| Absolute Radio Torbay | £18.8
| Talksport Redruth | £16.5
| *Absolute Radio Reading | £16.0
| Talksport Torbay | £15.8
| *Absolute Radio Hoo | £14.5
| Absolute Radio Redruth | £14.0
| *Absolute Radio Cambridge | £12.8
| Absolute Radio Aberdeen | £12.0
| Absolute Radio Plymouth | £12.0
| Absolute R Classic Rock Shropshire | £10.9
| Talksport Londonderry | £9.1
| Absolute Radio Dundee | £7.4
| *Absolute Radio Hull | £7.2
| Absolute R CR Wolverhampton | £6.9
| Talksport Rosemary | £5.5
| Talksport Plymouth | £5.7
| Smooth Berks (2 transmitters) | £5.5
| *Talksport Exeter | £5.1
| *Absolute Radio Sheffield | £4.0
| Northsound 2 | £3.9
| Talksport Aberdeen | £3.6
| Smooth Bristol | £3.8
| *Absolute Radio Merseyside | £3.4

BBC Local and Regional Radio, Radio 4 LW, Asian Sound, Panjabi Radio, Premier Radio Sabras, Love Sport and Radio XL are not casted as AM listening cannot easily be estimated. Asian Sound, Radio Sabras and Radio XL likely have low or very low cost per listener.

Transmitters covered by the same local radio licence are listed together.

Listening figures are based on 2019 RAJAR figures averaged across the whole year and are scaled by the proportion of listening estimated to be on AM (i.e., audience share). Absolute Radio estimates are adjusted according to the availability of Absolute and other rock stations on FM. AM shares of oldies/easy listening stations are adjusted according to whether there is a commercial competitor on FM or overspill of the same station on FM from a neighbouring area. These are marked with a †.

Transmission costs comprise antenna, transmitter, and distribution. Estimated antenna costs are shared across as many as five of a particular antenna and account for the number of masts and their height, varying between £30,000 and £150,000 per year. Taller masts are assumed to have larger ground masts. Costs will be higher than estimated here where antenna systems need rebuilding as these will be amortised over 4-10 years. Shared costs for continuing services have been adjusted to account for the BBC and Talk Sport transmitter closures scheduled for 2020.

Transmitter costs include electricity, maintenance and capital expenditure (assuming a 25 year replacement cycle). £9,000 per year is assumed for transmitters up to 1 kW and £10,000 per year up to 2 kW. Up to 20 kW, £8,000 plus £1,200 per kW is assumed. Above that, £1,600 per kW is assumed. Power estimates are based on transmitter output, not the broadcast power in the direction of maximum antenna gain.

The highest power stations typically use multiple 50 kW transmitters, thus it is reasonable to assume that maintenance and capital costs will be proportional to transmitter power. Costs will be higher than estimated here where capital costs are amortised over less than 25 years.

Transmitters marked with an asterisk (*) could reduce the cost per listener by reducing power.

Transmitters marked with a cross (†) provide night-time reception in areas where clear daytime reception is only available from a high-power transmitter.

For closed stations, RAJAR figures, AM share estimates and transmission cost estimates from just before they closed are used.

1 Audience figures are extrapolated from when the transmitter broadcast Free Radio 80s.
Appendix B: Land Value

An issue that is beginning to effect the viability of some AM transmission stations is land value. Medium-wave antennas normally incorporate a conductive ground mat of at least 40m in diameter per mast, which must be kept clear. Directional antenna systems require two or more masts. Consequently, they require substantially more land than FM and DAB transmitters. Most AM transmitters are located in rural areas or on flood plains so the sites have limited alternative use. However, some sites are within towns and cities and could be sold for development for housing, retail units or light industrial units, which would be considerably more profitable for the land owner than maintaining them as transmission sites. This has already happened for three sites. Reading Manor Farm, which carried Absolute Radio and Smooth, closed in May 2015; Bristol Mangotsfield, which carried BBC Radio Bristol and Smooth, closed in February 2016; and Aberdeen Nigg, which carried Northsound 2 closed in April 2018. Where a site is also used for FM and/or DAB, the part of the site used for the AM antenna could be sold while the transmitter building and FM/DAB mast is retained.

The following AM transmission sites have high potential for redevelopment:

- Lewsey Farm, Luton, carrying BBC Three Counties Radio (to close) and Smooth;
- Kempston, Bedford, carrying BBC Three Counties Radio (to close) and Smooth;
- Hadfield Road, Cardiff, carrying Smooth;
- North Looe near Epsom, carrying Premier;
- Bebington, Merseyside, carrying Radio City Talk;
- Colinswell, near Edinburgh, carrying Forth 2;
- Tywyn, Wales, carrying Radio Wales (to close) and Radio Five Live;
- Ashton Moss, Manchester, carrying Asian Sound and Greatest Hits Radio.
- Ashton Moss (NGW), Manchester, carrying Gold.

The following AM transmission sites have some potential for redevelopment:

- Little Shurdington, Gloucestershire, carrying Smooth;
- Hoo St Werburgh, Kent, carrying Smooth;
- Clipstone, Nottinghamshire, carrying Talksport;
- Folkestone, carrying Radio Five Live;
- Farnley, West Yorkshire, carrying Radio Leeds;
- Whitehaven, Cumbria, carrying Radio Five Live and Radio Cumbria (to close);
- West Lynn, Norfolk, carrying Radio Norfolk;
- Fulford, York, carrying Radio York (to close);
- Sheffield MF, carrying Radio Sheffield;
- Bexhill, carrying Radio Five Live and Smooth;
- Trowell, carrying Absolute Radio and Gold;
- Perth Friarton Road, carrying Radio Tay 2;
- Bow, London, carrying Premier – now closed due to redevelopment of an adjacent site;
- Gunthorpe, Peterborough, carrying Gold and BBC Asian Network;
- Crimpson, Doncaster, carrying Greatest Hits Radio;
- Rohais, Guernsey, carrying Radio Guernsey;
- Southwick, Brighton, carrying Radio Five Live, Talksport, Absolute Radio and Smooth;
- Fareham, carrying Radio Five Live, Talksport, Absolute Radio and R Solent (to close);
- Fern Barrow, Bournemouth, carrying Radio Five Live, Talksport, Absolute Radio, Smooth and R Solent (to close);
- Redmoss, Aberdeen, carrying R Five Live, Talksport (to close), R4 LW and R Scotland (to close);
- Wallasey, Merseyside, carrying Talksport and Radio Merseyside (to close);
- Hull, carrying Talksport;
- Stockton, carrying Talksport, Absolute Radio and Greatest Hits Radio;
- Wrekenton, Tyneside, carrying Talksport, Absolute Radio, Radio 4 LW and Radio Newcastle (to close);
- Brookmans Park, Hertfordshire, carrying Radio Five Live, Talksport, Absolute Radio and Lyca Radio;
- Droitwich, Worcestershire, carrying Radio Five Live, Talksport, Absolute Radio and Radio 4 LW;
- Lisnagarvey, Northern Ireland, carrying Radio Five Live, Talksport, Absolute, R4 LW and Radio Ulster.
Appendix C: Areas left unserved by BBC Local and Regional Radio AM Switch Offs

The following areas have been left with poor coverage of BBC local or regional radio following switch-offs in 2018 and 2020. This can be used to make a judgement of what the BBC might consider to be an acceptable loss of coverage elsewhere. The term “small population” refers to 2000 people or fewer.

**Radio Cornwall** (Mid Cornwall, 657): Parts of the Boscastle area (technically outside the AM coverage area) and Port Isaac (both small populations) have been left unserved.

**Radio Kent** (East, 744): FM coverage is poor in parts of Ashford, Canterbury and Faversham and along parts of the A28. However, these areas have good DAB coverage. FM and DAB coverage are both weak in Hamstreet, which has a small population and was on the edge of the AM coverage area.

**Radio Merseyside** (1485): There are a number of areas where FM coverage is weak, but DAB coverage is very good.

**Radio Norfolk** (East, 855): FM coverage of Thetford is very poor, but this area receives a good DAB service. Wells has weak FM reception and no DAB reception, but was on the edge of the AM coverage area.

**Radio Nottingham**: FM coverage is relatively poor, but DAB coverage is much better. The East Markham area has very weak reception on both FM and DAB. However, was on the edge of the AM coverage area and has good reception of Radio Lincolnshire.

**Radio Solent** (S Hampshire, 999): The Petersfield area will be left unserved, though it does receive BBC Sussex on FM and DAB. Winchester has poor FM reception (very poor in places), but good DAB reception. Ventnor is left with no FM reception, but a good DAB service. Several other parts of mid Hampshire have weak reception on both FM and DAB, but the affected populations are small.

**Radio Solent** (E Dorset and SW Hampshire, 1359): FM and DAB coverage around Fordingbridge is very poor (Burgate Manor Farm would serve this area), but was on the boundary of the AM coverage area. FM coverage of Poole is also very poor, though this area receives a good DAB service.

**BBC Sussex** (Brighton, 1485): The Steyning area has very poor FM reception, but is mostly served on DAB.

**Three Counties Radio** (Main, 630): Parts of Amersham, Chesham and Great Missenden weak FM and DAB reception. However, they were on the border of the AM service area.

**Three Counties Radio** (Bedford, 1161): Some villages to the north of Bedford have poor FM reception, but DAB coverage should be sufficient there. Some of these were on the edge of the AM coverage area

**Radio Wales** (Mid Powys, 1125): Knighton has poor FM reception of Radio Wales, while Presteigne and New Radnor (small population) have very poor reception. There were on the edge of the AM coverage area. Reception from the main Washford AM transmitter will be available, but subject to interference at night.

**Radio Wales** (West, 882): There are gaps in FM coverage along the A470 (noting that national FM is not available here either).

**BBC Wiltshire** (West, 1323): Box (small population) has weak FM reception and is unserved on DAB.

**BBC Wiltshire** (Swindon, 1368): Ogbourne St George (small population) has weak FM reception and is unserved on DAB.

**Radio York** (Main, 666): The Pateley Bridge area (small population) is unserved on FM and DAB, though very weak FM reception of Radio Leeds may be possible. This was on the edge of the AM coverage area

**Radio York** (Scarborough, 1260): The Ravenscar, Filey and Robin Hood’s Bay area (small population) is unserved on FM and DAB, though very weak FM reception of Radio Tees may be possible. This was on the edge of the AM coverage area

Appendix D: FM/DAB Coverage Gaps in areas where BBC Local and Regional Radio Continues on AM

This appendix provides details of areas served by the BBC’s remaining local and regional radio AM transmitters with poor FM and DAB reception. Some areas where FM is poor, but DAB is good are also discussed. Some of these areas may receive improvements to either FM or DAB coverage before the AM transmitters are switched off.
However, the BBC is likely to decide that FM or DAB coverage of smaller populations, particularly 2000 people or fewer, is not financially justifiable, particularly in England.

Radio Cambridgeshire (1026): Although DAB coverage is good, Ely, Godmanchester, Littleport and St Neots have poor FM reception.

Radio Cumbria (North, 756): FM and projected DAB coverage is non-existent in Alston and poor in Kirkby Stephen and Lorton (all small populations). Kirkby Stephen is just outside the AM service area and Alston just inside the AM boundary. If BBC national DAB transmitters were installed at these sites, Radio Cumbria could acquire much better FM coverage by swapping FM transmitters with Radio 3. In addition, some areas around Penrith have weak FM coverage, but will have good DAB reception once the North and West Cumbria multiplex launches.

Radio Cumbria (South, 837): Most areas of South Cumbria with poor FM and projected DAB coverage are also outside the AM coverage area. Coniston and Grasmere are on the border, but have small populations. Sedbergh is larger, but outside the AM service area.

Radio Derby (1116): Ashbourne has poor FM reception and is unserved on DAB. Parts of the Dove Valley (small population served by Grange Farm site) are unserved on both FM and DAB, but this is on the border of the AM coverage area. Long Eaton, Swadlincote, Wirksworth and parts of Burton have poor FM coverage, but good DAB reception.

Radio Devon (Barnstaple, 801): Serving all of this area on FM or DAB would require a large number of transmitters serving small populations. Providing coverage along the north coast requires additional DAB or FM transmitters at Woolacombe, Berryntarbour, Combe Martin, Beacon Castle (for Parracombe) and Countisbury (for Lynton). This is unlikely to be cost-effective. In addition, Ilfracombe is served by DAB, but not FM. Inland, FM reception is also weak (and DAB very weak) at South Zeal (served by) Stickelpath and Brayford (served by Wind Lane). Lynton and South Zeal are on the edge of the AM coverage area.

Radio Devon (Exeter, 990): FM coverage of East Devon is poor. DAB coverage is generally better. However, Beer and parts of Cullompton have weak FM reception and no DAB coverage. These could potentially be served by reallocating Radio 3’s Axe Valley and Gogwell FM transmitters, respectively, to Radio Devon. This would also improve FM reception in Axminster, Seaton and Tiverton, where DAB reception is available. Beer, Axminster and Seaton are on the edge of the AM coverage area. Radio 3’s Holcombe Down FM transmitter could also transfer to improve coverage in Dawlish and Exmouth, which also have good DAB reception. In addition, Sidmouth is served on DAB, but not on FM.

BBC Essex (Main, 765): FM and DAB reception in western Essex is very poor. New transmitters are needed at Alsa Wood (Serving the Stanstead area), Brentwood, Grays/Tilbury and Seward End (serving Saffron Walden). In addition Harlow is served on DAB, but not FM. Finding suitable FM frequencies for these areas would be difficult. Saffron Walden could potentially be served by adding BBC Essex to the Cambridge DAB multiplex while Brentwood, Grays and Tilbury could be served by adding BBC Essex to one of the London multiplexes. Alternatively, the BBC could argue that these areas are served by Radios Cambridgeshire and London, respectively.

BBC Essex (North East, 729): Both FM and DAB reception are poor in Harwich and Walton-on-the-Naze. Harwich is served by Radio Suffolk is available on both FM and DAB. A DAB transmitter at Felixstowe Walton Avenue or reallocation of Radio 3’s FM transmitter at Manningtree would serve Harwich, but not Walton-on-the-Naze.

Radio Foyle/Ulster (792): FM/DAB coverage should be adequate.

Radio Gloucestershire (East, 1413): DAB or FM transmitters are needed at Andoversford (small population, but major traffic route) and Winchcombe. In addition, Bourton-on-Water, Moreton-in-Marsh and Stow-on-Wold have good DAB coverage, but poor FM coverage.

Radio Gloucestershire (West, 1413): DAB or FM transmitters are needed at Chalford, Cinderford, Coleford, Dursley and Nailsworth.

Radio Guernsey (1116): FM coverage should be adequate.

BBC Hereford and Worcester (North, 1584): An FM or DAB transmitter at Titterstone Clee Hill or an FM transmitter at Woofferton is needed.

BBC Hereford and Worcester (Worcester, 738): An FM or DAB transmitter at Titterstone Clee Hill would also improve coverage through much of Worcestershire. A further transmitter at Wood Norton or Lark Stoke, serving the Evesham and Pershore is also be needed.
Radio Jersey (1026): FM coverage should be adequate.

Radio Lancashire (855): A DAB or FM transmitter at Haslingden may be needed as there are parts of Rossendale where FM coverage may be weak; some of these are on the edge of the AM service area. The Radio 3 FM transmitter there could potentially be reallocated to Radio Lancashire. Barnoldswick, which is outside the AM service area, also has weak FM coverage and could potentially be served by reallocating the Radio 3 FM transmitter (The Skipton national DAB transmitter serves Barnoldswick).

Radio Leeds (774): Parts of Bradford have weak FM reception, but good DAB coverage. The Radio 3 FM transmitters at Idle could potentially be reallocated, as could the transmitters at Hebden Bridge and Todmorden, which are just outside the AM service area. The (serving North Bradford).

Radio Norfolk (West, 873): This area is not currently served by local DAB. North West Norfolk, including Burnham, Hunstanton and Wells-next-the-sea has areas of weak FM reception. It may be possible to serve this area with a single new FM transmitter at Burnham or by increasing the power to the north of the existing FM transmitter at Great Massingham. South West Downham Market and Mundford (small population) also have poor FM reception. Most of these areas are on the edge of the AM service area.

Radio Scotland (Central, 810): The Arrochar area (Argyll) and Crianlarich (Stirlingshire) (both small populations) are unserved on FM or DAB by any radio service. The AM transmitter also provides significant road coverage, such as along the A82, A84 and A85 in West Stirlingshire, North Argyll and SE Highland may also be needed.

Radio Scotland (North, 810): The Bremar, Balintuin, Ballochbuie Forest and The Cairnwell area of Aberdeenshire, together with Durness and Tongue in NW Highland are unserved on FM or DAB by any radio service, while the Lairg and Balblair Wood area (Highland), Melvich (NW Highland), and Tomintoul (Moray) have weak FM reception. All of these areas are unserved on DAB and have very poor FM reception. However, the AM transmitter also provides significant road coverage.

Radio Sheffield (1035): FM and DAB reception in Hathersage is weak, but this has a small population and is on the edge of the AM service area.

BBC Somerset (1566): The Vale of Taunton has no FM or DAB reception. The population is not sufficient to justify an FM relay, but a DAB transmitter at Washford would also serve the towns of Minehead and Watchet, so could be viable. Cheddar (potentially served by Fry’s Hill) may also have weak FM reception and no DAB reception, but is on the border of the AM service area.

Radio Stoke-on-Trent (1503): A new DAB transmitter is potentially needed for Cheadle as FM coverage is weak there. FM coverage of Congleton and Macclesfield is also poor, though these areas receive a good DAB service. Macclesfield is outside the AM service area.

Radio Ulster (Main, 1341): Bellair (Antrim), Cushendall (Antrim), Glenariff (Antrim) and Glenelly Valley (Tyrone) (all small populations) are unserved on DAB and have very poor FM reception.

Radio Ulster (Enniskillen, 873): Belcoo (Fermanagh, small population) is unserved on DAB and has very poor FM reception. Castlederg (Tyrone) also has weak FM and DAB reception.

Radio Wales (South, 882): New FM or DAB transmitters may be needed at Abercynon, Abergele, Abergwynfi, Blackmill Blaina, Cwm, Knighton, Maesteg, Monmouth, New Radnor (small population), Presteigne and Sennybridge. There are also coverage of gaps along the A40 and A470 which might be served, noting that national FM is not available here.

Radio Wales (North, 882): A new FM or DAB transmitter is potentially needed at Morfa Nefyn to serve the west Llyn peninsula due to the lower power to the north from the Radio Wales transmitter at Blaenplwyf compared with national FM. The Radio Wales signal from Llanddona is also weaker here. Potential coverage of gaps along the A5 and A470 could also be served, noting that national FM is not available here. In addition, Abergele, Meliden and Talysarn have poor FM reception, but are served by DAB.

Radio Wales (Wrexham, 657): A new FM transmitter at Trefynnon or DAB transmitter at Brynford Hill may be needed to improve reception in parts of the Holywell area.