Arqiva submission to Ofcom's consultation, *Award of the 700 MHz and 3.6-3.8 GHz spectrum bands*

About Arqiva

Arqiva is a communications infrastructure and media services company operating at the heart of the mobile and broadcast communications industry. Arqiva provides infrastructure for television, radio, mobile and other wireless communication in the UK.

Arqiva operates shared radio site assets throughout the UK working with the mobile industry for over two decades and with a significant presence in suburban and rural areas. Our portfolio includes over 8,000 active mobile, radio and television sites.

Arqiva worked with DCMS to build new shared sites in 'not-spots' as part of the Mobile Infrastructure Programme (MIP). We also extend the MNOs' coverage and capacity into challenging environments such as Canary Wharf and the ExCel Centre.

Arqiva is building a national Internet of Things ("IoT") network, starting with 10 of the UK's largest cities. Our smart metering service, connecting 10 million homes using long-range radio technology, will be one of the UK's largest machine-to-machine deployments.

Arqiva is a founder member and shareholder of Freeview. We broadcast all eight Freeview multiplexes, are the licensed operator of four of them. Arqiva is the licensed operator of both national commercial DAB digital radio multiplexes.

Arqiva is a major player in the UK's satellite industry, and is a major provider of permanent satellite services to both Freesat and Sky customers. Arqiva also provides global satellite based services to the security, oil & gas and exploration sectors.

Arqiva is owned by a consortium of long-term investors and has its headquarters in Hampshire, with major UK offices in London, Buckinghamshire and Yorkshire.

Media Networks - Terrestrial Broadcasting

DTT use of the 700 MHz Duplex Gap

Overview

Ofcom should read this section as Arqiva's response to Consultation Question 12: Do you agree with the non-technical conditions that we propose to include in the licences to be issued after the award of the 700 MHz and 3.6-3.8 GHz bands?

This is an area of significant interest and importance for Arqiva as ongoing access to the 700 MHz duplex gap for DTT would support the platform and ensure that UK viewers have access to a broad range of UK free-to-air content in an increasingly competitive TV platform market. Allowing these TV services to remain on air is consistent with Ofcom's statutory duties as it minimises the risk of Ofcom carrying out a policy which switches off popular free-to-air TV services with fallow spectrum left in their place.

Ofcom *can* realise this policy successfully but is introducing unnecessary risks to reaching the above objectives. This is due to its inflexible approach to allowing continued access to the spectrum, especially with its proposal to allow access for DTT past June 2020 on a wholly inadequate one-month rolling basis. This is in the additional context of duplex -gap dependent mobile services being highly unlikely to deploy in the UK anywhere near the time of the award. Furthermore, our own experience of working on 4G expansion demonstrates mobile operators will have significantly more than a one-month horizon for planning the roll-out of these services.

In our view, Ofcom should be more whole-heartedly supporting the UK's primary free-to-air platform. As Sharon White noted[1], this is happening at a time when global players such as Netflix, Google and Amazon Prime are posing increasing threats to UK-based media platforms.

We propose the following, therefore:

- Establish a more flexible approach to revoking our post June 2020 licence but based, in principal, on a 12-month notice period mindful that:
    - The proposed one-month rolling notice period risks creating a chaotic switch-off of TV services for millions of viewers
    - Broadcasters book advertising time over much longer periods – usually 12 months in advance
    - There is now little prospect of mobile services being ready to use the duplex gap by May 2020 and Ofcom and the MNOs would, in any case, know at least 12 months in advance when such services were due to be deployed
- Acknowledge that the wider political context may facilitate DTT use of this spectrum *legally* beyond May 2022; and
- Consider protection into DTT services in the duplex gap in the event that they to continue beyond the shorter-term.

[1] https://www.ofcom.org.uk/about-ofcom/latest/media/speeches/2018/british-tv-stronger-together

We welcome confirmation that the multiplexes (Com 7 & 8) which were set up in 2014 to carry additional HD and SD services can, subject to certain conditions, continue in the 700 MHz duplex gap beyond May 2020 on a licensed basis. However, such access would need to be able to meet the interests of viewers and on a sustainable commercial term for broadcasters.

There is, of course, no point in Arqiva gaining access to this spectrum if our customers cannot agree commercial deals with us on the basis of the short-term arrangements that Ofcom are proposing.

A further worrying background to these unresolved issues continues to be the residual threat to the DTT platform from a removal of Com 7 & 8 services in 2020. These multiplexes include three-quarters of DTT's existing HD services together with other PSB and free-to-air channels. Our 2016 consultation response set out the risk of churn to the platform[2] were this to happen and our ongoing assessments lead us to believe that this is still the case.

We set out our detailed concerns on Ofcom's proposals below. However, to place this in a wider context, we outline first how Freeview is meeting the challenges of increasingly challenging market conditions.

Free-to-air TV is thriving but will need support from Government and Ofcom

The Digital Terrestrial Television Platform in the UK, through Freeview, continues to be an unqualified success. It remains the only TV platform that offers subscription-free channels to viewers on a universal basis and with high levels of reliability. It underpins a successful UK creative sector, enabling funding to produce world class original content[3] in return for the fulfilment of regulatory obligations to support public policy objectives.

Digital switchover transformed the platform in 2012, allowing it to offer a significant increase in channel choice for viewers while enabling the release of spectrum for new 4G mobile services. More recently, the creation of a hybrid broadcast/broadband platform through the introduction of Freeview Play has allowed DTT to compete effectively in a space previously occupied by the more generously funded pay-TV platforms. The UK is now widely recognised as providing leadership in Europe for developing hybrid TV, with other free-to-air platforms following Freeview's lead.

This sits against a backdrop of the emergence of powerful global players in the TV industry. Netflix, Amazon Prime, HBO and others have changed the dynamics of how TV content is consumed and brought pressure to bear on traditional UK-based platforms and broadcasters. Sharon White set this out in 2018:

> *You only have to look at the high street to see the impact of Amazon and other online retailers and it's the case that British TV and British broadcasters now need to do more to tackle head-on the threat of their own online competition*[4]

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[2] At that time, independent analysis pointed to churn levels away from DTT of between 550,000 and 1.1m viewers

[3] In particular through the TV licence fee, availability of UHF spectrum and EPG prominence for PSB channels

[4] https://www.itv.com/news/2018-07-18/traditional-tv-broadcasters-could-soon-be-thing-of-the-past/

In the face of this pressure, Freeview has managed to thrive. It is the only major broadcast platform in the UK which is growing its viewer base, with nearly a million extra households coming on board between 2016 and 2018.[5] By the end of 2018, Freeview Play had sold more 6.2 million[6] devices from a standing start in 2015. Meanwhile, an increasing number of viewers are opting to swap multichannel pay-TV packages for a pick-and-mix approach, combining Freeview with low-cost, subscription video on-demand (SVOD) services.

The importance of channels carried on Com 7 & 8 in this story cannot be understated.

At a time when high resolution pictures have become the norm on other TV platforms, extending availability of HD content (as well as the further expansion of SD channels) has become crucial for DTT and its viewers. The current line-up of channels is set out below:

Table 1: Channels on Com 7 & 8

Com 7	Com 8
BBC News HD	BBC Four HD
4seven HD	CBeebies HD
Channel 4+1 HD	Quest HD
Al Jazeera Eng HD	QVC HD
RT HD	QVC Beauty HD
Smithsonian	Forces TV
Jewellery Maker	PBS America
5 USA+1	5 Star +1
CBS Reality+1	FreeSports
Pick+1	NOW 80s
Quest Red+1	NOW 90s
Travelxp	Together
Transworld	

In the meantime, suitable and sufficient spectrum *is* available to carry those services in the form of the 700 MHz duplex gap.

Ofcom should, at the very least, be seeking to avoid taking policy positions which risk undermining the UK's principal free-to-air platform. It should be seeking to support Freeview in its efforts to compete with other platforms in delivering high quality content. It is, in this particular case, wholly in Ofcom's gift to minimise the risks to the DTT platform that have been created by the broader issue of spectrum scarcity.

Regrettably, its current proposals for the future use of the 700 MHz duplex gap fall short. They represent a real risk for the platform by jeopardising the long-term availability of valued HD and SD services for viewers. We set this out in more detail below.

Market, regulatory and political developments since 2016

We are encouraged that Ofcom's high-level policy remains to allow DTT to continue in the duplex gap beyond May 2020 - albeit under established prescribed circumstances relating

[5] Source: BARB
[6] GFK

to interference management[7] and the possible emergence of new mobile services. There also appears to have been positive progress relating to:

- Stipulating that MNOs should give details of any SDL (supplemental downlink) deployment, and
- To confirm that access to the spectrum after the award in May 2020 will be on a non-exclusive basis.

Separate to this, we note that in its current consultation, *Enabling opportunities for innovation,* Ofcom sets out its general approach to unused mobile spectrum by stating:

> *We share the objective, set out in the Department for Digital, Culture, Media and Sport's* Future Telecoms Infrastructure Review, *of wanting third parties to be able to have access to awarded mobile spectrum in places where it is not being used by the MNOs.*[8]

Ofcom then goes on to set out a process in that document whereby the new user would have access to the MNO spectrum for a minimum of three years with significant notice periods. This contrasts starkly with the one-month notice period on offer with our proposed use of the 700 MHz duplex gap.

It is unclear to us why Ofcom is not applying this approach to the award of the duplex gap spectrum and the proposed use of DTT in those frequencies. Ofcom should consider applying those principles to this spectrum or, at least, set out why it is treating the 700 MHz duplex gap differently to other potential sharing possibilities in licensed mobile spectrum.

We believe that Ofcom, consistent with its statutory duties, should be seeking to achieve the objective of securing the most valuable use of the 700 MHz duplex gap in the medium term as well as the longer term. In the medium term (that is, 3-5 years and potentially beyond) it is perfectly plausible that the most valuable use of the 700 MHz duplex gap will be DTT, through continued Com 7 & 8 services. If this proves to be the case, Ofcom should seek to allow viewers to continue to benefit from those services and enable those DTT services to continue in those frequencies where possible.

In turn, we continue to recognise the imperative to avoid blocking access to the spectrum as and when the new mobile licensee requires it to deploy its own services.

We think it worth reflecting on the progress of two key background factors which affect the framing of Ofcom's policy on the use of the duplex gap, namely:

- The progress of new mobile services looking to use the 700 MHz duplex gap, and
- The impact of EU legislation and how it might limit the duration of access to these frequencies beyond the date of clearance.

*Emergence of new mobile service*s

Ofcom's initial approach to the use of the 700 MHz duplex gap was set out in its May 2016 statement, *Maximising the benefits of 700 MHz clearance.* At that time, Ofcom was confident of the prospect of new mobile services – in particular, SDL – being ready to

[7] We set out our most recent assessment that there was a low risk of interference into mobile services in a letter and report to Ofcom dated 1 March 2019
[8] Paragraph 8.8

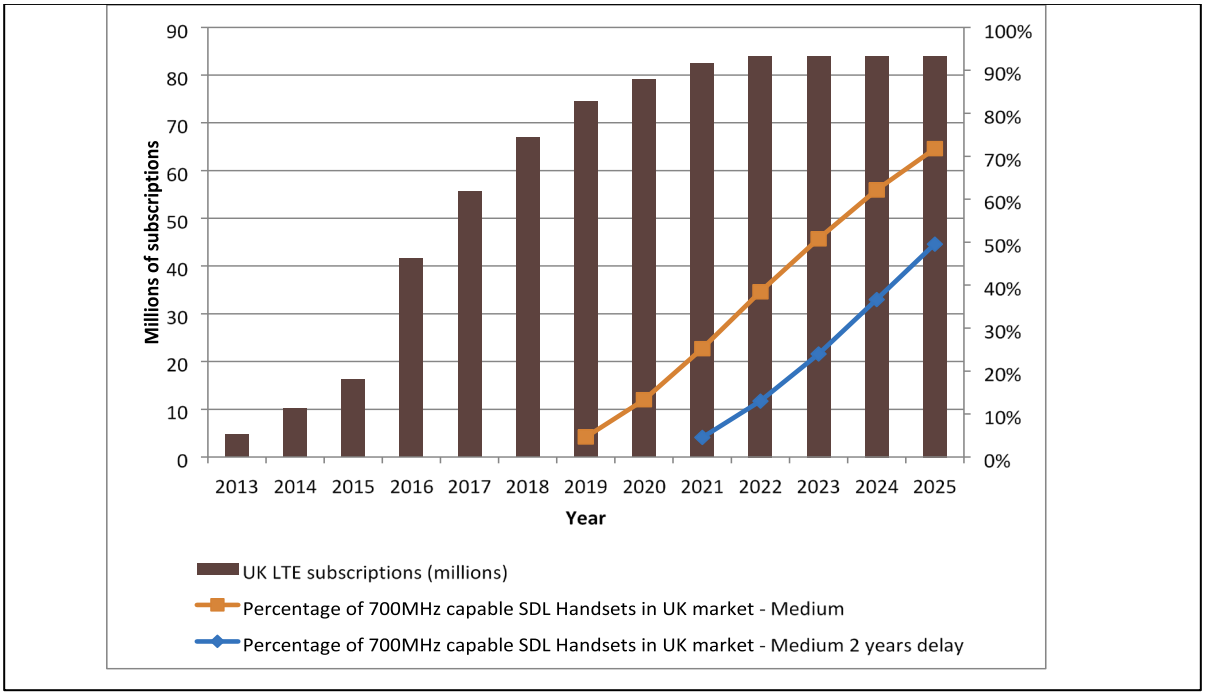
deploy as soon as clearance was completed in May 2020. Ofcom relied, to a great extent, on the existence of 3GPP standards which supported SDL in the 700 MHz duplex gap. It also accepted the representations of several mobile stakeholders who similarly asserted that such services would likely be ready within this timescale.

Despite the existence of the 3GPP standards and the elapsed three years since those projections, there are to date:

- No handsets in circulation which support 3GPP Band 67 (SDL700);
- Only 2 handsets in circulation, by way of comparison, which support L-Band SDL - introduced a full 5 years after that 3GPP standard was agreed and 8 years after the related CEPT harmonising decision;
- Only one operator licensed to use the 700 MHz duplex gap within the EEA region[9];
- Little demonstrable demand for this spectrum where auctions have taken place. This is the case, so far, even where *not all operators have managed to win paired 700 MHz in the respective auctions[10];*

PA Consulting supported our submission to Ofcom in 2016 by preparing a report which, at that time, estimated that handsets would start to become available to use in the duplex gap between 2019 and 2021. As it turns out, three years on, that appears optimistic.

Figure 1: Take up of SDL700 Capable LTE Handsets **Source: PA Consulting (2016)**



This chart outlined that it would take one year from the point at which handsets were available on the market for handset penetration to reach 13% and two years to reach just over 20%. It is worth observing that there is no clear view on whether these levels of handset penetration would necessarily lead to switch on of services.

[9] Swedish auction, 7 February 2019
[10] As was the case with the Italian and Swiss auctions in 2018

Our knowledge of the mobile eco-system has further developed in other areas since 2016. The closest proxy for SDL use of the 700 MHz duplex gap is, in our view, SDL use of the spectrum in 1452-1492 MHz. As we set out above, handsets in the UK containing chipsets for these frequencies were introduced in 2018 – a full 5 years after the relevant harmonising ECC Decision[11].

The equivalent 700 MHz duplex gap ECC harmonisation Decision[12] was published in 2016 with an EU Decision[13] and 3GPP standards agreed later that same year. The 5-year lag experienced with L-Band handsets might, therefore, suggest availability of 700 MHz duplex gap configured handsets by about 2021. However, there are reasons why the gap between standardisation and handsets may be longer than 5 years in the case of the 700 MHz duplex gap, namely:

- Unlike L-Band SDL, there is still much less alignment in Europe on whether the 700 MHz duplex gap SDL should be used for commercial LTE with a much more prevalent push for PPDR (public protection and disaster relief) use in several countries; and
- We have been made aware that manufacturers are facing technical difficulties in physically placing Band 67 chipsets in devices. We would advise Ofcom to speak to relevant stakeholders in the broader mobile industry to establish the extent of this issue;
- There is, in any case, potential for problems with intermodulation products if 700 MHz SDL and 700 MHz FDD base stations are co-located. Non co-sited SDL will also likely have an impact on the 700 MHz LTE FDD downlink as a result of 'hole punching'. Resolving the technical issues of SDL and FDD coexistence could slow down any introduction of SDL; and
- The newly available 700 MHz paired spectrum will address coverage downlink-driven requirements for some time, obviating any obvious need for the 700 MHz duplex gap. In contrast, L-Band SDL is more suited to meeting capacity requirements, along with the 2.3 GHz, 3.4-3.6 GHz and 3.6-3.8 GHz bands;

Clearly, given the continuing lack of activity around and interest in developing services in the duplex gap, the evidence strongly points to a much later deployment of services than previously envisaged in the 2016 PA Consulting report and the 2015 Ofcom consultation.

With that in mind, it is worth reflecting on the policy position set out in paragraph 1.25 of Ofcom's 2016 Statement:

> *If new and contrasting evidence emerges over the coming years, we will consider whether there is a case for revising the position we have set out here. For example, if it were to become evident that mobile data services were not going to be ready to launch in the centre gap until later in the 2020s,* ***we would consider whether allocating the centre gap to them from then remained appropriate*** [our emphasis]*.*

[11] CEPT ECC Decision 13(03)
[12] CEPT Report 60 (
[13] EU) 2016/687

From a strict spectrum efficiency perspective, there is a case to be made that DTT will remain the most valuable use of this spectrum for some time to come. Given the increasing likelihood that this will be the case in the medium (or even longer) term, Ofcom should be seeking to put in place conditions which would enable access to these frequencies for DTT services. In particular, it should adopt a policy that allows DTT to continue if mobile services are not ready to deploy **in a commercially viable manner**.

As importantly, removing TV services from viewers when there is limited prospect of mobile consumers being able to benefits from SDL mobile services does not further the interests of either citizens or consumers in relation to communications matters.

Impact of EU legislation

The European Union passed legislation in 2017 to harmonise the timing and technical details of 700 MHz clearances across the 28 EU Member States and 3 EEA States. As part of that Decision, the EU agreed provisions for continued use of the 700 MHz band for DTT after May 2020 - the mandated deadline for making the spectrum available for mobile services. However, this extended use could only take place under specific circumstances and would be time limited for a two-year period.

Recent political developments call into question the relevance of that two-year deadline. For example, the UK Government tabled secondary legislation at the end of 2018[14] setting out its intention to set aside the EU UHF Decision in its entirety in the event of the UK leaving the EU in March 2019 without a withdrawal agreement. There are, of course, several scenarios which may play out in terms of when the UK will cease to be subject to EEA (Single Market) legislation and, by extension, whether the provisions of the UHF Decision will apply or when they will cease. Ofcom cannot say at this stage, therefore, with any confidence that DTT *legally* must vacate the 700 MHz duplex gap by 2022.

This, then, effectively becomes a policy decision for Ofcom. Given the uncertainty on the timing of the introduction of mobile services as set out above, it is unclear what evidential basis (in terms of ensuring spectrum efficiency, meeting consumers' needs, or otherwise) Ofcom would have to establish a policy for clearing DTT from the duplex gap as early as 2022.

We would welcome guidance and confirmation from Ofcom and Government on this issue as a matter of urgency. At a minimum, Ofcom should ensure that its policy is flexible to cover a range of Brexit outcomes.

A one month rolling notice period creates unnecessary and significant risks for the DTT platform

Ofcom has given some consideration to its policy on the use of the 700 MHz duplex gap since its initial consultation on this in September 2015. In particular, its confirmed policy position to license DTT in these frequencies (subject to market and technical criteria being

14 https://assets.publishing.service.gov.uk/media/5bfbf6f0e5274a0fdaaaa075/FINAL_The_Radio_Spectrum__EU_Exit__Regulations_2018.pdf

met) will be welcomed by viewers who have come to value the additional HD and SD channels provided by COM 7 & 8.

Such a welcome, though, will be tempered by the details of Ofcom's proposed approach. We have particular concern with the proposed one-month rolling notice period that has been set out as this may not provide the regulatory certainty required to sustain DTT services beyond May 2020. The proposals are unnecessarily inflexible given the emerging doubt as to whether MNOs will be able to launch new services in the duplex gap by 2020. By proposing a rolling one-month notice period with little clarity on how this will be triggered, Ofcom is introducing risks for both viewers and DTT broadcasters. We note that the one-month notice being offered to DTT contrasts confusingly with the 3-month notice that the relevant MNO licensee would need to give Ofcom of its intent to roll out new mobile services in this spectrum. More pertinently, MNOs will know much further in advance than the stipulated 3 months when such services will be launched.

There is a risk of a disorderly switch-off of channels for viewers with wider risks for the DTT platform

Triggering notice for DTT to vacate the duplex gap would have obvious immediate consequences for viewers. There would be a significant and noticeable reduction in channels, especially HD channels which would materially reduce in number. In response to this, we will need to put in place measures to explain to viewers what changes are being made to the platform and why. Com 7 & 8 is available to approximately 70% of the UK population, spread across the UK nations. Preparing them for such a profound change to their TV services is no small undertaking and would require, at a minimum, the following actions from Digital UK:

- Conducting preparatory work to agree messaging and coordinate communications and outreach activities;
- Briefing its advice line operators; and
- Ensuring all other relevant advice lines for DTT viewers (including those operated by broadcasters and other TV platform operators relying on DTT and TV manufacturers) are also appropriately briefed

A botched switch-off of TV channels risks exacerbating an already difficult situation for the DTT platform which we raised in our response to the 2016 consultation. As we set out above, independent forecasts at that time pointed to ✂

Broadcasters plan over much longer timescales than Ofcom are allowing for

Ofcom will be aware from previous discussions with us that the terms of any extended access beyond May 2020 will need to recognise the commercial models that these channels have adopted. Regrettably, the proposals as set out in the consultation fall significantly short of doing this.

To secure a broadcaster's commitment to book capacity on a terrestrial multiplex capacity, certainty of carriage is required by the broadcaster to meet commercial arrangements they have with various suppliers and commercial partners. In particular, airtime and advertising

agency commitments are generally agreed on an annual cycle. Playout, EPG data contracts and programme licence periods are typically multi-year.

In addition, to remove a channel, or multiple channels, from the Freeview platform a comprehensive communications plan across multiple stakeholders, including: viewers, broadcasters and shareholders would need to be managed, which would require as significant degree of coordination so as not to cause confusion and misinformation across the market.

As a result of the above, it is unclear to us whether there is scope to reach any commercial decisions with our customers under the current proposed approach by Ofcom. This again increases the risk of a premature shutdown of the two commercial multiplexes with significant disruption to many millions of DTT viewers. A resultant churn of viewers away from the platform is a real risk with potentially far-reaching reputational damage. Such an outcome can be avoided by adopting a more flexible approach as set out in this submission.

Mobile network operators plan over much longer timescales than Ofcom are allowing for

Ofcom's proposal to allow for a one-month rolling notice period makes little sense given the planning horizons that MNOs typically work under ahead of introducing services. ✂.

Ofcom needs to put in place a more flexible approach to notice periods

We recognise that Ofcom has a parallel policy objective of ensuring that the duplex gap is available for the new mobile licensees as and when they are ready to deploy services which require the use of those frequencies. We are, therefore, keen to work with Ofcom to identify a solution which can satisfy all parties.

It is likely, in our view, that nothing will have materially changed with regards market conditions for SDL between now and the award in 2020. This is particularly the case in a continuing situation where no handsets are available which support SDL services in the 700 MHz band. If that is, indeed, the case, Ofcom should be able to make a reasonable assumption that services will not be available to deploy within, say, 12 months.

This means that by the time Ofcom is inviting applications for the 700 MHz/3.6 GHz award over the coming year, it *should* be able to take an informed view on whether the duplex gap will be required for mobile services by, say, the end of 2020. This could be established, for instance, by checking:

- Whether compliant handsets are yet being manufactured or sold in the UK or whether there are plans to manufacture or sell such equipment in the near future;
- Whether 700 MHz duplex gap spectrum has been sold to MNOs across the EEA region who have expressed an intention to deploy SDL services (as opposed to buying spectrum for option value purposes);
- The extent to which there are technical difficulties in placing Band 67 chipsets in devices; and
- What future deployment plans the relevant mobile licensee has made.

In that spirit, we recognise that the new licensee(s) will likely want to initiate trials of new services using the duplex gap at some point after the award of their licence. We are concerned that both Ofcom and the licensee(s) may seek to clear DTT services in numbers

that are not strictly warranted by the requirements of a trial. For example, would a trial *necessarily* need to take place in the centre of an urban area? Or would DTT need to be cleared on a nationwide basis if there was no identified risk of harmful interference?

We are committed to working with the new licensee(s) to enable successful trials and to ensure that there are no obstacles to a future introduction of mobile services. In return, we ask that Ofcom and the licensee(s) seeks to take reasonable steps to avoid unduly disrupting ongoing TV services that are available to 70% of the UK population.

A process of monitoring relevant developments on a rolling 12-month basis could be set up involving Ofcom, the relevant licensee(s) and Arqiva to ensure that the needs of both the MNO and the viewers are best met. This rolling twelve-month notice could be reflected in the new DTT licence but with an acceptance that any unforeseen market development may require an intervention from Ofcom to vary that notice.

This contrasts with the current proposals which risks seeing a cliff-edge switch-off of DTT channels followed by an indeterminate period where valuable spectrum will likely sit fallow, with the possible introduction of new mobile services some years in the future.

<u>There is no scope for commercial engagement between Arqiva and the new licensee</u>

One of Ofcom's proposals is that we should engage directly with the new licensee to agree the duration of the licence that we would be operating under. Ofcom is silent on whether it expects us to agree any other terms of spectrum access as part of these discussions and we would welcome clarification on this.

We note that Ofcom accepts that we may not come to an agreement with the MNOs on this issue. Accordingly, it sets out its back-stop proposal of a monthly rolling licence - the terms of which are inadequate for the reasons set out above. In reality, there are three central reasons why there is no real prospect of discussions between us and the new licensee reaching agreement or, indeed, even taking place. These are the:

- Risks of the appearance of collusion if we were to talk to any of the four likely bidders for the duplex gap ahead of the auction;
- Very limited amount of time between the 700 MHz auction (expected in Spring 2020) and the spectrum being made available in June 2020; and
- Lack of incentive for the new licensee to enter into any discussion at a time when it will be focussing on deploying networks supported by 700 MHz paired spectrum and the 3.6-3.8 GHz band.

With specific regards to the point on collusion, we consider that any discussions with MNOs on possible use of the 700 MHZ duplex gap ahead of the auction taking place would be in potential breach of award regulations as set out previously in Section 12[15] of the 800 MHz Award Regulations. For that reason, it is highly unlikely that an MNO would be open to any such conversation with a third party such as proposed by Ofcom in this instance.

The point on limited time between the auction and the spectrum being made available is self-evident but also is linked to the third bullet where there is a ✂

[15] https://www.ofcom.org.uk/__data/assets/pdf_file/0033/109788/statement-auction-regulations.pdf

We also note that Ofcom has accepted the limitations of commercial agreements between spectrum licensees and access seekers in its *Enabling opportunities for innovation* consultation. For example, it states in paragraphs 8.7 of that consultation:

> *We believe licensees may have little incentive to engage with third parties to lease their spectrum given the additional responsibility this brings*

Given the above, we believe that the only credible way of enabling DTT access to the 700 MHz duplex gap beyond May 2020 will be through an Ofcom issued licence, of a duration which recognises the lack of SDL demand for the spectrum, takes into account the impact of viewers losing access to channels and reflecting the commercial reality of how DTT multiplex customers operate.

Extended DTT use of the 700 MHz duplex gap should receive protection from harmful interference

In its 2016 Statement on the use of the 700 MHz duplex gap, Ofcom stated the following:

> *We would not generally expect other users of the band to be required to manage the risk of interference from or to the interim multiplexes*[16]

At that time, Ofcom were assuming that any continued use of the duplex gap for DTT, if at all, would be relatively short-lived. Under those assumptions, such an approach to interference could have been seen as proportionate. As we set out above, however, it is now perfectly feasible that Com 7 & 8 services could continue for a much more significant period of time – in the possible extended absence of SDL services and the falling away of the EU UHF Decision – and possibly well beyond 2022.

Ofcom has confirmed that any DTT use after May 2020 will be under the auspice of a WT Act licence, which ordinarily would offer protection from harmful interference for spectrum users.

In that context, Ofcom should consider whether its statutory duties should extend to taking some role in minimising the interference from paired 700 MHz services into DTT use of the duplex gap. This should be done in a way that recognises the rights of both licensed users of the 700 MHz band. For example, Ofcom would need to clarify its role in resolving any issues where there is evidence that adjacent mobile users were operating in breach of their technical licence conditions.

Managing interference from mobile services into DTT

Ofcom should read this section as Arqiva's response to Consultation Question 7: Do you agree with our proposed approach to coexistence in the 700 MHz band?

We broadly support the approach set out by Ofcom in Section 8 of the consultation as it relates to managing and mitigating any interference from new mobile services into the existing DTT network. In doing so, we fully endorse the parallel submission from Digital UK, who manages the UK DTT network on behalf of its shareholders.

[16] Paragraph 1.22

Media Networks – Satellite

Ofcom should read this section as Arqiva's response to Consultation Question 11: Do you agree with our view that we do not need to include any specific conditions in 3.6-3.8 GHz licences to mitigate the risk of adjacent band interference?

Arqiva operates five teleports across the UK, located at Crawley Court, Chalfont, Bedford, Martlesham and Morn Hill. We make extensive use of the spectrum between 3.6-4.2 GHz, providing a range of satellite services from TV to datacoms - provisioning the international broadcast and enterprise sectors. Our interest in Ofcom's consultation as it relates to our satellite business lies in its proposals for mobile use of the 3.6-3.8 GHz band and the potential for interference into those satellite downlinks which have been forced to move into the adjacent band 3.8-4.2 GHz.

We have set out previously our broad support for the clearance of the 3.6-3.8 GHz band for mobile, recognising the significant value that these frequencies will likely give to citizens and consumers. This support was in the expectation that the clearance of existing satellite users from that spectrum would be done in an orderly manner, recognising the legitimate interests of industry and the potential impact on users of those legacy services. A key part of this is to ensure that there will be sufficient and suitable spectrum for those existing satellite services in the 3.8-4.2 GHz band.

To understand the impact of Ofcom's proposed approach on our teleports, we have undertaken our own analysis of the likely impact on our teleports and their deployments of antennae receiving at 3.8-4.2 GHz. We have, in particular, had regard to the proposed mobile emission levels as set out in Annex 15 of Ofcom's consultation.

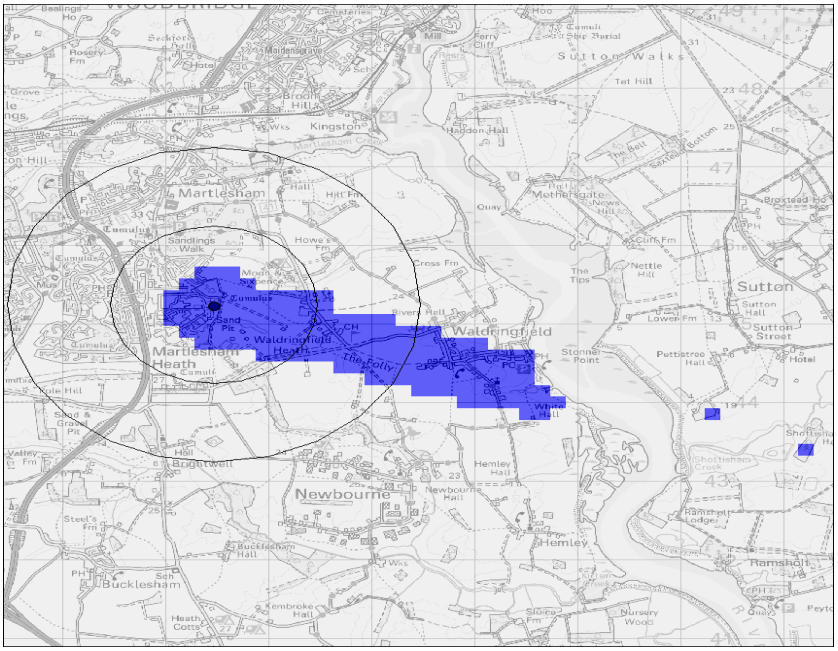
Each of our teleports operate in different environments, each with unique terrain and clutter characteristics. This provides various levels of shielding from mobile out of band emissions at each location. Furthermore, antennae receiving at 3.8-4.2 GHz range in sizes (typically between 7m and 13m diameter), and have specific geometries (Azimuth and Elevation angles) depending upon their specific application. All of these factors have an impact on the potential levels of interference.

We have modelled the likely impact on our earth stations, taking into account the different shielding characteristics in each teleport, the range of antennae sizes and associated geometries. In most cases the levels of interference are sufficiently low so as to present minimal risks to ongoing provision of services. There are, however, three points of concern which we would argue require regulatory intervention in the form of protection areas in the new licences being issued by Ofcom. These are:

Martlesham Heath – we have identified a risk of interference for C-Band antennae (both sizes) pointing eastwards. Ofcom may wish to note that Martlesham is the only one of our teleports which allows access at acceptable elevation angles (>5 °) to satellites at 68.5°E due to its Easterly location. This precludes even the hugely costly option of moving certain activities to alternative teleports.

The maximum distance affected is potentially up to 6km Easterly, as indicated below in Figure 2.

Figure 2. Area of interference into Martlesham Heath teleport



Crawley Court – we have identified a risk of interference for C-Band antennae pointing South and West. The maximum distance affected is approximately 1.3km, shown below in figure 3. We have also identified an impact easterly from Crawley Court across Crawley village, from some 13m at the rear of the teleport. The protection distance in this case was ~3km, pattern below in figure 4:

Figure 3: Area of westerly interference into Crawley Court teleport

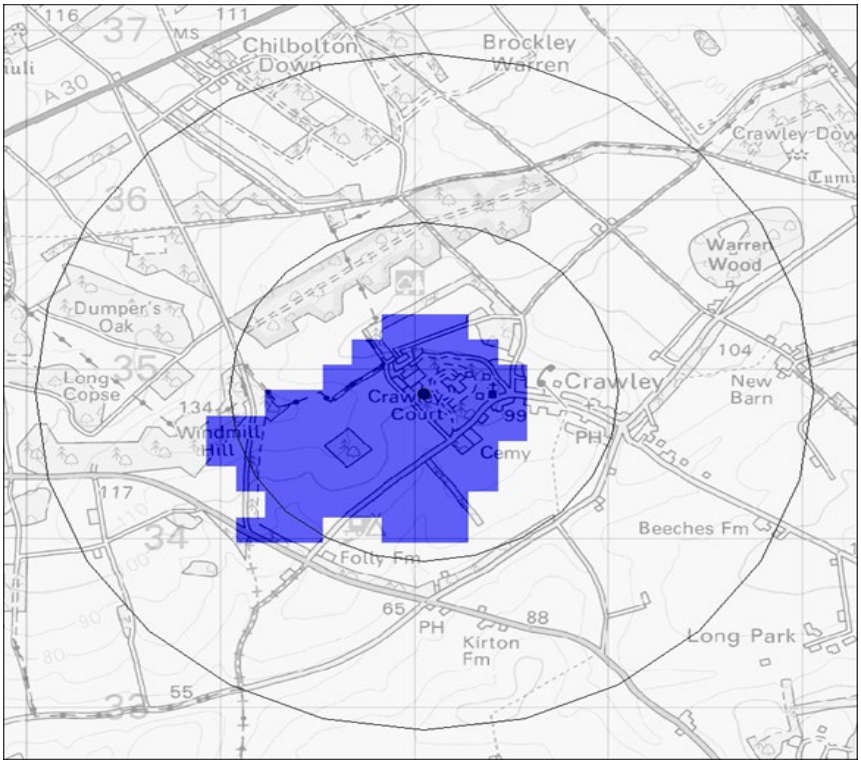
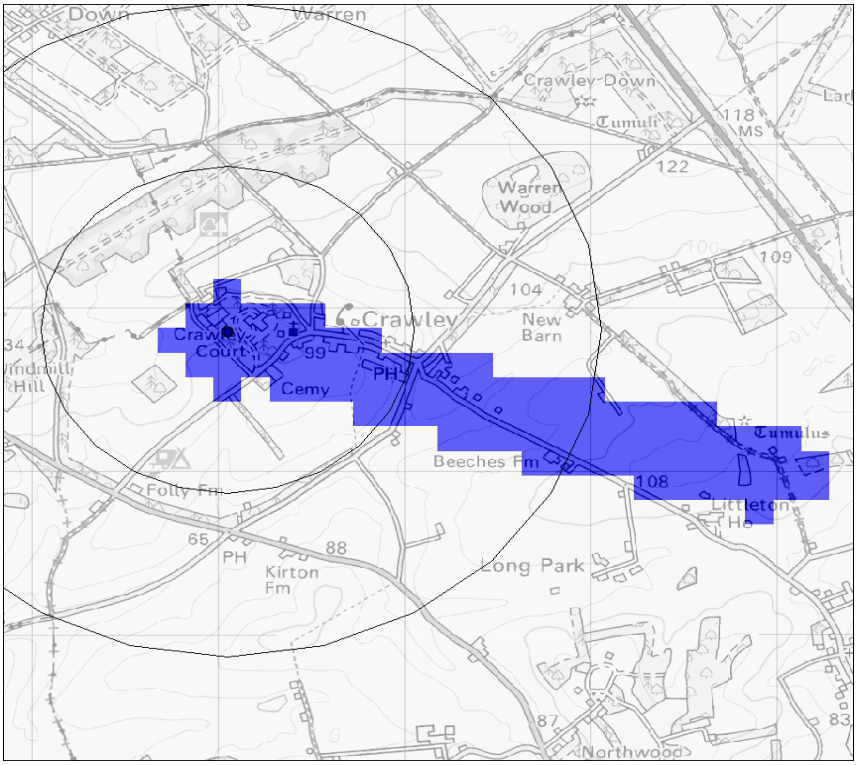
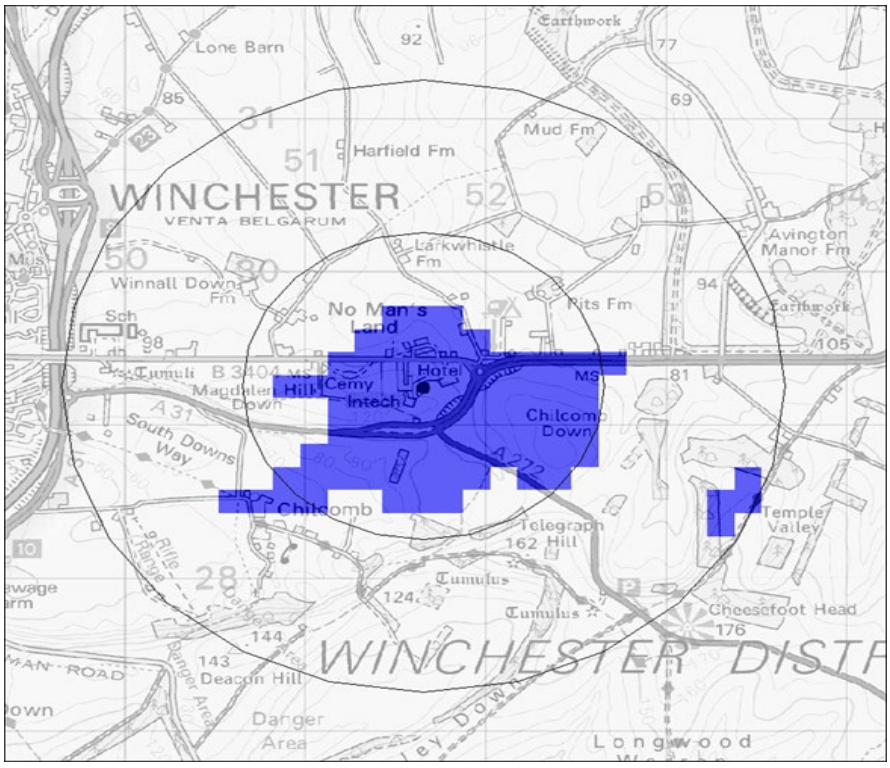


Figure 4: Area of easterly interference into Crawley Court teleport



Morn Hill - we have identified a risk of interference for C-Band antennae pointing South, East and West. The maximum distance affected is approximately 7.6km as set out below in Figure 5.

Figure 5. Area of interference into Morn Hill teleport



Ofcom's consultation preference for not establishing technical protection areas in new mobile licences. However, in the cases set out here protections *could* be put in place with an absolute minimal impact on the value of the spectrum to new users, while giving certainty to satellite operations. This is because it is unlikely that 5G deployments will be prioritised in rural areas where these teleports are in. This would likely be the case even in the longer term.

We are keen to work with Ofcom to minimise the risk to existing services and look forward to discussing how best to address this in the context of realising the fullest possible value for mobile 5G services.

Telecoms

Our interests in this consultation as it relates to telecoms lies in Ofcom's proposed 700 MHz coverage obligations and how they could be achieved more effectively by harnessing the benefits of independent infrastructure provision.

Overview

Ofcom should read this section as Arqiva's response to Consultation Question 1: Do you agree with our proposals on the coverage obligations as set out in this section? Please give reasons supported by evidence for your views.

We support the focus within this consultation on delivering on the crucial public policy objective of mobile coverage. As the largest independent provider of wireless infrastructure in the UK, we are well placed to be part of the solution to ensuring that high speed broadband services can be provided to ever-growing numbers of people in a cost-effective way. This should crucially include extending coverage to those citizens and consumers who currently cannot access these services owing to circumstances over which they have little control.

Ofcom has sought to strike an appropriate balance between delivering on coverage while minimising the costs that mobile operators would likely face in increased infrastructure investment. It has decided to take the approach of creating standalone lots for greater coverage as it acknowledges there is no requirement for any of the operators to acquire any of these. Even if the lots are acquired the best-case outcome falls short of the 95% coverage target that the Government has set for 2022 (which we discuss further below). Our concern with this approach is that it will fall much further short of ubiquitous coverage than other possible approaches that could have been considered.

The principle that infrastructure sharing can contribute toward lower cost wireless infrastructure deployment is long accepted by both Government and Ofcom. It was reflected in the newly revised European Electronic Communications Code package where a lighter touch approach to regulation for independent infrastructure provision was agreed in comparison to MNO self builds. Independent infrastructure leads to lower costs for operators, higher occupancy rates and associated environmental gains and network duplication is minimised.

With that in mind, we are keen to explore further with Ofcom over the coming months how enhanced infrastructure sharing could lead to improvements in coverage above and beyond those being proposed by Ofcom in this consultation. In doing so, we are conscious that this could see a more ambitious approach to the policy challenge of coverage and one which marks a significant departure from current regulatory practice.

We support the proposal to build 500 new masts with each coverage licence

Ofcom is to be commended in its approach to improve coverage in a way which involved tangible benefits for consumers. We agree that achieving coverage gains by, for example, increasing transmitter power levels may not translate into actual gains for those without mobile services. With that in mind, we recognise the potential that actual mast deployment could bring in this respect by incentivising the targeting of actual unserved populations.

Our expectation is that there will be a significant additional incentive on operators to build out additional masts at a lower cost than the level of the maximum discount – if this discount is set at the optimal level. For the reasons set out above, this should provide further incentives for licensees to use independent infrastructure providers such as Arqiva.

As a result, we believe that the market should be able to deliver the propose coverage gains at the network level in a way that does not undermine the new licensees' commercial plans. Indeed, we would go further and suggest that the proposed coverage levels are unduly modest as they do not fully recognise the cost-efficiencies that are available to operators who choose to share infrastructure, including sharing:

- Towers;
- Antennas;
- Power;
- Field Operations;
- Active RAN; and
- Transmission and Point of Interface;

Our own internal analysis of the potential for enhancing coverage under an enhanced infrastructure sharing approach suggests that affordable coverage levels significantly greater than 90% geographical coverage could be achieved within the right regulatory framework and with the right incentives in place.

We are conscious, however, that the UK is operating within the constraints of the EU UHF Decision and needs to make the 700 MHz band available for mobile by June 2020. While we note elsewhere in this response the government's approach to the future of this piece of legislation, we recognise that Ofcom is unlikely to materially alter its current proposals, developed over the last year considering wider industry and government consultation.

<u>The UK is committed to achieving 95% mobile coverage by 2022</u>

On 15 February 2020, DCMS reaffirmed the government's manifesto commitment of achieving 95% geographical mobile coverage in the UK by 2022 in its Strategic Statement of Priorities (SSP) consultation. This raises the question as to how this can conceivably be achieved once the 700 MHz band has been auctioned in 2020 with coverage obligation levels at the lower geographical level of 90% of the UK. Specifically:

- The only policy lever we are aware of which is open to Ofcom to achieve the stipulated mobile coverage levels is through licences at the time of award;
- There is no provision for applying coverage targets retrospectively on operators' spectrum holdings[17]; and
- After the 700 MHz and 3.6 GHz awards the only spectrum which might be auctioned for mobile services is the 26 MHz band, which is clearly unsuitable to have coverage obligations attached to it.

Our view is that these ambitious government coverage targets *can* be met in a cost-efficient way for operators - but only through increased use of independent infrastructure to minimise

[17] Such an approach has effectively been recently attempted in Germany in relation to its 5G spectrum awards and is likely to be subject to legal challenge.

costs. Both Ofcom and government will need to establish what mechanism they would need to put in place to create the necessary incentives or obligations for industry to reach ever greater mobile coverage levels.

Of relevance to this consultation is the requirement on Ofcom that is included in DCMS's Strategic Statement of Priorities (SSP)[18]. This requires it to see the material improvement of mobile coverage "across the UK particularly in rural areas and on the UK's major roads" as "**the** key priority in the conduct of [the 700 MHz and 3.6-3.8 GHz] auction" (our emphasis).

As currently drafted, Ofcom's coverage proposals are voluntary. As the consultation acknowledges, there is not requirement for any of the operators to acquire any coverage obligations in the auction. Therefore, as it stands, the rules that Ofcom have proposed do not guarantee that there will be *any* improvement in mobile coverage in any part of the UK as a result of the auction. This is in conflict with the obligation from the Government to secure material improvements. Therefore, the coverage obligations should be rewritten so that they apply to all of the new licensees.

Further, the coverage obligations as they stand currently do not have any specific requirements on road coverage. While Ofcom says that it "*anticipates* that the obligations are likely to deliver increases in B-road and minor road coverage" that is not the same as guaranteeing a material improvement in mobile coverage on roads as a result of the auction. If Government is requiring Ofcom to see material improvement of mobile coverage on road as one of the two key priorities in the auction that would suggest that the coverage obligations should be revisited to ensure that a material improvement in mobile coverage on roads in guaranteed by the auction.

We also note the speech made by Jeremy Wright, Secretary of State at DCMS, at the Enders conference on 7 March 2019. With reference to telecoms innovation, he said the following:

> *I want to see new innovative ideas from industry to deliver widespread, high quality coverage. And if necessary,* ***we will consider every single tool that we and Ofcom have in the policy and regulatory toolbox in order to achieve that 95 per cent goal*** [our emphasis].
>
> *It is essential that the UK has the telecoms infrastructure to meet the growing demands of consumers and businesses. And promote the benefits of connectivity across the whole of the UK.*

Overall, in light of this new requirement from the Government Ofcom should look at the obligations afresh. There should be a focus on guaranteeing expansion of coverage beyond where it is today (not only a removal of partial not spots) and to guarantee that there will be a material improvement in rural areas and on the UK's major roads. While other factors may also be relevant the Government has made it clear that it expects that coverage will be *the* key priority for Ofcom in this auction and so Ofcom should subordinate all other factors as secondary to that.

[18] See pages 17 and 18