
700 MHz clearance programme timescale review

Review of progress, risks and readiness

About this document

When confirming the timescales for the delivery of the 700 MHz clearance programme, we undertook to carry out a review of progress in August 2017. We published our findings in October 2017 and concluded that the project was on target for completion in Q2 2020 as planned. We noted that there were some risks to that timescale, arising out of the possibility of poor weather or unplanned events of national significance. As we approach the end of 2018, we have carried out a further review of progress. This document summarises our further review and its conclusions. Our overall conclusion remains the same as previously: the 700 MHz clearance programme is delivering to schedule and we expect the process to complete in Q2 2020 as planned.

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1. Executive summary and background

- 1.1 700 MHz Clearance is a programme through which some of the spectrum currently used by Digital Terrestrial Television (DTT) and Programme Making and Special Events (PMSE) licensees will be cleared of its existing users and made available for mobile broadband use. DTT services will be moved to alternative portions of spectrum and the 700 MHz band frequencies will cease to be available to PMSE¹.

We previously decided that the 700 MHz band should be made available for mobile broadband use by Q2 2020

- 1.2 In November 2014, we decided to make spectrum in the 700 MHz band available for mobile data as soon as practicably possible². Initial plans indicated that it would be possible to make the band available by the end of 2021. We continued to explore ways with the DTT Multiplex operators to complete the programme sooner than this.
- 1.3 Following further work, the DTT multiplex operators proposed a plan which would enable completion of clearance to be brought forward to Q2 2020. We subsequently consulted on the costs and benefits of making the spectrum available to this earlier timescale³.
- 1.4 In October 2016, we confirmed our conclusion that adopting the accelerated plan will best secure optimal use of spectrum⁴. Consequently, we took a spectrum management decision that we would bring forward release of the 700 MHz band to Q2 2020. Given that it is funding the programme, we discussed this decision with Government. The Government agreed that the proposal to clear the band by no later than Q2 2020 should be adopted.

The timescale would be subject to a review carried out in August 2017, which concluded that the programme is on track to meet our target for completion in Q2 2020, although noted that 700 MHz clearance is a large engineering project susceptible to delivery risks.

- 1.5 Findings of the 2017 review⁵ were that all the workstream areas considered in our review were on track. Delivery of clearance events in the North of Scotland had proceeded well and to schedule. Preparations for the clearance events in 2018 were also proceeding to plan.

¹ We have previously announced alternative spectrum will be made available for PMSE use: *New spectrum for audio PMSE* https://www.ofcom.org.uk/data/assets/pdf_file/0021/62481/New-Spectrum-for-Audio-PMSE-statement.pdf

² *Decision to make the 700 MHz band available for mobile broadband*, Ofcom statement, November 2014 https://www.ofcom.org.uk/data/assets/pdf_file/0024/46923/700-mhz-statement.pdf

³ *Maximising the benefits of 700 MHz clearance*, Ofcom consultation, March 2016 https://www.ofcom.org.uk/data/assets/pdf_file/0026/84176/maximising-benefits-of-700mhz-clearance.pdf

⁴ *Maximising the benefits of 700 MHz clearance*, Ofcom statement, October 2016 <https://www.ofcom.org.uk/consultations-and-statements/category-1/maximising-benefits-700mhz-clearance>

⁵ *700 MHz clearance programme timescale review*, Ofcom statement October 2017 https://www.ofcom.org.uk/data/assets/pdf_file/0022/106933/700mhz-clearance-timescale-review.pdf

- 1.6 Our 2017 review included a high level stakeholder meeting with the main programme stakeholders (who had carried out their own reviews) and all parties agreed that, subject to no significant unforeseen events occurring, the planned end date was on track and achievable.
- 1.7 We noted, however, that the programme is a complex engineering implementation project which is subject to a number of risks that could delay completion, relating to weather and unplanned occurrences of national significance that could jeopardise the overall timetable if they prevent work being carried out on the broadcast network during periods of intensive activity.
- 1.8 Nevertheless, within the project there is some ability to re-schedule events as the transmission company Arqiva Transco has planned to carry out installation tasks at the earliest opportunity.
- 1.9 Overall, our 2017 review concluded that the clearance programme will deliver to schedule and therefore expect the process to complete in Q2 2020 as planned.

We have carried out a further review of progress one year after the previous review to assess progress and status of the risks

- 1.10 We have reviewed the progress since our last review of infrastructure work and other associated activities against the target clearance date of Q2 2020. This report provides a summary of our review and its conclusions.
- 1.11 There are several contributing workstreams and sources of information that we have considered in our review. The main areas are listed below:
- Development of the frequency plan and progress towards international coordination agreements;
 - Status of the work planning infrastructure changes;
 - Infrastructure build programme progress;
 - Knowledge gained from clearance events⁶ carried out during 2018, including viewer support; and
 - PMSE grant scheme

The programme is on track to meet our target for completion in Q2 2020, major risks have not materialised during 2018.

- 1.12 All the workstream areas considered in our review are on track.
- 1.13 The DTT frequency plan is stable and virtually complete with only very minor enhancements now being made. We have concluded international frequency negotiations and signed agreements with all relevant countries (Ireland, The Netherlands, France and Belgium).

⁶ We use the term 'clearance event' to describe when frequency changes are made at a transmitter and viewers need to take action to retune their TV equipment.

- 1.14 Plans for the modification of broadcast transmission infrastructure and implementation of the changes are highly advanced and stable.
- 1.15 Delivery of clearance events in 2018 has proceeded well and to schedule. Preparations for the clearance events in 2019 are also proceeding to plan.
- 1.16 We previously identified some risks inherent to complex engineering implementation projects which could delay completion. The most significant risks are:
- Prolonged periods of poor weather that delay work carried out outdoors, particularly the installation of antennas at the larger transmitters; and
 - unplanned occurrences that could cease infrastructure works (such as national emergencies or events of significant media interest) could jeopardise the overall timetable if they prevent work being carried out on the broadcast network during periods of intensive activity.
- 1.17 Since our last review, neither of these risks has materialised to the extent that they have resulted in a slippage to the programme timescale. Although there have been some instances of poor weather, the transmission company Arqiva has been able to re-schedule events and maintain progress.
- 1.18 Work is routinely scheduled to avoid planned major broadcast events. Since our last review, there have fortunately been no instances of unplanned events that resulted in a need to stop work on the transmitter networks.
- 1.19 We conclude that the clearance programme has made sufficient progress to deliver to schedule and therefore expect the process to complete by 29 April 2020 as planned.

PMSE funding scheme

- 1.20 In August 2018 we published our statement on funding for PMSE equipment owners that have to clear the 700 MHz band by May 2020. The statement set out our conclusions on the eligibility criteria to be met by claimants and the principles underpinning the equipment rate card. It also set out proposals on the approach to funding additional costs incurred by PMSE equipment owners through participating in the funding scheme.
- 1.21 Equiniti Ltd has been appointed the scheme administrator and will process PMSE claims in accordance with the criteria as set out in the August 2018 statement

2. Our review

Commentary on main programme workstreams

- 2.1 Our review concentrated on reviewing progress, forecasts and risks for the key workstreams contributing to delivery of 700 MHz clearance. These are set out under the headings below.

Frequency planning and coordination is completed

- 2.2 Principal frequency planning for all regions is complete. There are occasional minor adjustments to the plan to take account of updated infrastructure information (e.g. final antenna patterns) and any implementation changes during roll out.
- 2.3 700 MHz clearance requires the UK to negotiate and agree new frequency plans with four Administrations: The Republic of Ireland, France, The Netherlands and Belgium. We have completed and signed Final Agreements with all four Administrations.
- 2.4 Overall, the frequency planning and international coordination workstreams have delivered to target and any remaining risks are minor and manageable.

Infrastructure planning has made good progress with the scope of work and rollout plans agreed

- 2.5 Ofcom, Arqiva and the Multiplex Licensees are continuing to work to finalise the scope of infrastructure works required to deliver 700 MHz clearance and to implement the infrastructure changes.
- 2.6 A stable sequence for the planned frequency changes has been developed and the interactions and timings when changes will be made in the UK and for continental transmitters are now well understood and established.
- 2.7 The rollout plan is still subject to small refinements as transition arrangements are developed in detail. Revised plans are typically produced between quarterly and half-yearly. Refinements now affect only a very small number of the smaller transmitters and are minor in scope.
- 2.8 The technical and rollout plans are now well developed and understood and are not a significant risk to successful delivery of 700 MHz clearance to schedule.

Infrastructure build works are progressing well and delivery of the programme to schedule is achievable.

- 2.9 Infrastructure work is considered in two categories:
- a) 'airworks' - replacing broadcasting antennas at transmitters sites where the existing antennas will not function on the post clearance frequencies. Some of the transmitter structures are very tall – up to around 300m in height; and

- b) 'groundworks' – site preparation, then installation of temporary transmitters and combining equipment to carry the broadcast TV services while the permanent equipment is retuned to new frequencies.
- 2.10 As airworks is the clearance activity most dependent upon favourable weather, Arqiva has planned antenna installations to take place early in the programme, which commenced in 2016. During 2018, airworks have continued to make good progress taking advantage of the favourable weather. Work on most main transmitter antennas is now complete and the level of airworks activity is reducing with all main transmitter antenna changes due to be completed during 2019.
- 2.11 Airworks at a number of sites are expected to complete Q4 2018. Having reviewed the status of work at those sites, we are content that sufficient progress has been made and that adequate contingency plans are in place, should delays occur so that planned clearance dates in 2019 for those sites are not impacted.
- 2.12 A risk remains that prolonged poor weather or other events of national significance could result in infrastructure work ceasing for a period. Such an occurrence could threaten the overall timescale for clearance should it occur during an intensive period of infrastructure build-out or clearance events. The risk from poor weather is, however, declining as the emphasis of the on-site engineering work moves from airworks to groundworks.
- 2.13 Clearance events (where a transmitter switches to broadcasting on new frequencies and viewers need to re-tune their TV sets) commenced in the latter half of 2017 in the North of Scotland. During 2018, the level of activity has increased considerably, with a corresponding increase in groundworks activity for the 2018 clearance events. Clearance events have, with two exceptions, kept to schedule. In one case (Sandy Heath) clearance was postponed and completed six weeks later than originally scheduled while a transmitter site engineering issue was remedied. In the other case (South Knapdale), clearance was deferred to a point in 2019 when longer daylight hours would be available for some complex on-site optimisation work. Both events have been re-scheduled and neither has had an impact on programme timescales.
- 2.14 The programme has to date been able to accommodate some significant broadcast events that have occurred but were not known about when the rollout schedules were planned. Two examples are the General Election in June 2017 and the Royal Wedding in May 2018. On-site engineering works and clearance events were re-scheduled to avoid interrupting transmissions around those dates and were successfully completed shortly afterwards without impacting the overall timescale.
- 2.15 During 2019, the programme will focus on clearance of a larger number of the smaller relay transmitter sites which presents a different logistical challenge compared to the high power transmitter sites.
- 2.16 Arqiva has derived a practical plan that considers available resources and supplier delivery ability and schedules airworks at the earliest opportunity at each site. This means that there is some time between when airworks are scheduled to complete and groundworks planned to commence or when clearance is to occur.

- 2.17 Progress on the infrastructure build has been good. While some residual risks remain as described above, we judge that progress in 2018 has been sufficient to enable clearance events in early 2019 to complete as planned. The airworks programme in 2019 becomes less critical than in 2018 and we therefore expect fewer opportunities for significant delay to arise.

Viewers have not been unduly impacted by the clearance events and have received good support

- 2.18 As the infrastructure works progress, TV sets and set top boxes in viewers homes need to be re-tuned to the new frequencies. Not all transmitters in the UK need to change frequencies and therefore not all DTT viewers will be affected by clearance, and cable and satellite viewers will not be affected at all.
- 2.19 For those that do need to take some action, the vast majority of householders will only need to retune their television sets. This requires them to press a few buttons on their TV remote controls.
- 2.20 Viewers are alerted to the forthcoming changes by on-screen captions that provide a number to call and a website where they can find further information. Digital UK has also been providing targeted publicity through local advertising. Digital UK so far provided advice to viewers in more than 100,000 calls, emails, web chats and social media interactions.
- 2.21 In addition, in-home support has been provided for those that require additional assistance. This service has been provided by the organisation DMSL and has been operating well with high levels of customer satisfaction.
- 2.22 A small number of viewers (we originally estimated less than 1% of households) may need to replace their TV aerials if they are of an old type that does not work sufficiently well when the TV services move to their new frequencies. In these cases, there is help available for DTT-only viewers, including free installer visits and aerial replacements where required. DMSL has provided over 10,000 home visits so far.
- 2.23 The clearance events in 2017 and 2018 have all been carried out to schedule (with the exception of the two instances described in 2.13 above) and the clearance plan is still proceeding to the planned clearance dates. The level of calls to viewer support services has been around the lower end of expected ranges and feedback on viewer satisfaction levels has been good. This suggests that most viewers find the clearance process relatively straightforward and the information provided sufficient.

Preparations for 2019 and beyond are on track

- 2.24 Digital UK, on behalf of the DTT Multiplex Licensees, carried out a series of risk reviews relating to the programme. Their review made recommendations for enhancing some project areas and we are continuing to work with them and other stakeholders to further de-risk the delivery of the programme.

- 2.25 Monthly high-level stakeholder meetings are undertaken and the main programme stakeholders continue to agree that, subject to no significant unforeseen events occurring, the planned end date of 29 April 2020 remains achievable.
- 2.26 As noted above, work in preparation for clearance events has been progressing well, including in preparation for events in 2019. The Multiplex Operators, their agent Digital UK and the transmission company Arqiva have continued to work to deliver 700 MHz clearance to the 29 April 2020 date.

PMSE funding scheme

- 2.27 Once 700 MHz clearance has completed, PMSE users will no longer have access to the 700 MHz band. We have given notice to PMSE users that they will need to cease use of frequencies in the 700 MHz band by 1 May 2020. However, in November 2017 we also made the decision to allow PMSE users to continue to access the 700 MHz guard band (694 to 703 MHz).⁷
- 2.28 Government decided to fund a grant scheme to support PMSE equipment owners that have to vacate the 700 MHz band earlier than expected. We agreed with Government to design and run the grant scheme and in August 2018 we published our statement confirming the eligibility criteria to be met by claimants and the principles underpinning the equipment rate card. Our statement also set out proposals on the approach to providing additional funding to help PMSE equipment owners meet additional costs incurred through participating in the funding scheme.⁸ We will consider stakeholder responses on this and publish our final conclusions shortly.
- 2.29 Following a competitive tender, Equiniti Ltd has been appointed the scheme administrator. Equiniti Ltd previously administered the Channel 69 PMSE funding scheme as part of the clearance of the 800 MHz band.

We will be consulting on proposals for helping the small numbers of DTT viewers who may be affected by interference from future mobile services in the 700 MHz band

- 2.30 We previously conducted analysis and field work to understand the potential for any interference from future mobile networks into DTT. This led to the publication of a consultation on coexistence in May 2017.
- 2.31 We then published an update setting out our conclusions on a technical assessment of the nature and scale of interference risks in December 2017.⁹ Having taken account of stakeholder responses, we concluded that the number of households potentially affected

⁷ Spectrum for audio PMSE: Use of the 694 to 703 MHz guard band, November 2017

https://www.ofcom.org.uk/__data/assets/pdf_file/0027/107775/statement-spectrum-audio-pmse.pdf

⁸ *PMSE clearing the 700 MHz band: Support for PMSE equipment owners*, Ofcom statement and consultation, August 2018, https://www.ofcom.org.uk/__data/assets/pdf_file/0022/118831/PMSE-700-MHz-statement-and-consultation.pdf

⁹ *Coexistence of new services in the 700 MHz band with digital terrestrial television*, Ofcom update, December 2017, https://www.ofcom.org.uk/__data/assets/pdf_file/0025/108655/update-coexistence-700-mhz.pdf

by interference from mobile services in the 700 MHz band will be similar to the number of households currently affected by 800 MHz mobile services, around 0.2% of households using DTT as their primary means of reception. We believe that filters, that can be fitted in the aerial cable to a TV or set top box, will provide the most technically effective means to mitigate any interference.

- 2.32 We have developed a proposal for helping people affected by coexistence. We will set this proposal out in the Future Spectrum Award consultation that will be published shortly.¹⁰ We will be seeking stakeholders' views on our proposals. A statement setting out our conclusions will be published next year.
- 2.33 This workstream is progressing to schedule and we expect plans for coexistence to be fully finalised by the time of the award of 700 MHz spectrum.

Conclusion

- 2.34 Taking into account all of the areas of this review, we conclude that that the 700 MHz clearance programme is delivering to schedule and we therefore expect the process to complete in Q2 2020 as planned.