
Wholesale Voice Markets Review 2021-26

Statement

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STATEMENT

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Contents

Section

1. Overview	1
2. Summary of decisions	4
3. Background	11
4. Wholesale Call Origination	21
5. WCT and MCT market definition and SMP assessment	30
6. WCT and MCT market remedies	42
7. WCT: interconnection	72
8. Regulatory Financial Reporting for WCT and interconnection	121
9. WCT: technical standards for IP interconnection	143
10. Termination on the 070 number range	151
11. Donor Conveyance Charge	163

Annex

A1. Regulatory framework
A2. Cost modelling
A3. Legal tests
A4. Glossary
A5. Legal instruments

1. Overview

This document sets out Ofcom's decisions on the regulation of the wholesale markets that underpin landline and mobile telephone calls in the UK.

Telephone calls are an essential service for many people. In 2019, 200 billion minutes of calls were made by customers using a landline or a mobile service. People's continued reliance on mobile calls in particular came to the fore at the start of the spring lockdown announced in March 2020, with a 10%-45% increase of mobile voice traffic across operators, compared with the period before the lockdown.¹ Competition in these markets results in greater choice, innovation, better quality and lower prices for customers. To ensure competition is effective, Ofcom regulates a number of wholesale markets that support our ability to call each other.

The way we use phones to speak to each other is changing. The use of mobile and online communications services – for instance apps that enable online messaging or video calls - is increasing², and landline use is declining. The traditional landline telephone network in the UK, the public switched telephone network (PSTN), is coming to the end of its life and is gradually being replaced. Over the next few years, landline calls will be carried over more modern, internet protocol (IP) networks, and landline services will increasingly be delivered over broadband connections.

We consulted on our proposals for the regulation of wholesale markets for call services in August 2020, taking into account the changes occurring in these markets. Having taken these and responses to our consultation into account, we set out below our decisions for the regulation of wholesale markets for call services from April 2021 to March 2026.

What we have decided

To deregulate the wholesale market for landline call origination. We have removed the current regulation on BT's Wholesale Call Origination (WCO) service, which enables people to make outbound calls over a landline. The large majority of landline calls made by providers other than BT already use alternatives to BT's WCO service. As providers move to more modern methods of supplying landlines, they will no longer need to purchase this service from BT. We expect the transition to more modern methods to take place by the end of 2025 and BT has offered voluntary commitments to maintain its WCO service in line with current regulation during that transition period.

To continue to set caps on the charges for terminating landline and mobile calls in the UK. Call termination is a wholesale service provided by a phone company to connect incoming calls to a customer on its network. Without charge caps, providers would be able to charge high rates for termination. This is because the originating provider has no other choice than to buy the termination service from the terminating provider. The caps apply to termination charges for landline and mobile calls that are made within the UK. The cap for mobile call termination has been reduced to reflect the lower costs faced by mobile operators. In the first year of the market review period, 2021/22,

¹ Ofcom 2020. [Connected Nations 2020 – UK Report](#), page 32. [Accessed 15 March 2021]

² Ofcom 2020. [Online Nation – 2020 Report](#), Figure 5.2 and page 143. [Accessed 16 March 2021]

the cap will be 0.379 pence per minute. For landline call termination, we have maintained the price cap its current level of 0.0292 pence per minute in real terms.

For calls originating from abroad, to require UK providers to charge no more than the equivalent rates charged by their international counterparties where those are higher than the UK regulated cap. This is a change from the current situation, where the same termination price caps apply to all calls regardless of their origin. We have decided to allow UK communications providers to set termination charges for incoming calls from abroad that can be higher than the caps we are setting for domestic calls, but only where the UK communications provider faces a high termination charge from its international counterparty when its customers make calls terminating on the counterparty's network overseas, and only up to the level of the reciprocal termination charge. We have made this change because this is the approach that is most likely to deliver low termination rates in the UK and for calls terminating abroad; which is the outcome of most benefit to consumers.

To move the focus of regulation from traditional to more modern interconnection. Over the period of the market review, we expect IP interconnection to become the main method of interconnection as industry moves away from the traditional landline telephone network. We have decided to regulate IP interconnection so that BT has to interconnect on fair, reasonable and non-discriminatory terms, including prices. We also require BT to publish a timetable for the migration from traditional interconnection to IP interconnection.

In order to encourage the move to modern interconnection, BT must offer interconnection with its IP network for termination of calls on BT's network at the regulated termination rate from April 2025. This is to provide certainty to telecoms providers that by April 2025, they will be able to access the regulated termination rate for calls to numbers allocated to via IP interconnection, including for those numbers that may still be held on BT's traditional network. As a consequence, from April 2025, BT will no longer be able to charge for certain additional services for IP interconnection, on top of the regulated termination rate.

To continue to set a cap on termination rates for calls to 070 numbers equivalent to the mobile termination rate cap. This is to minimise the risk of high prices, bill shock and scams resulting from high termination rates.

Not to renew the charge control for conveyance of calls to ported mobile numbers (Donor Conveyance Charges (DCC)). However, we will retain the requirement that these charges are set at cost, which should mean that these charges will not increase above their current level.

To incentivise the use of common technical standards for IP interconnection. We set out guidance on the interpretation of the network access obligation - stating that the provision of IP interconnection in accordance with the relevant IP interconnection standards is likely to be consistent with those obligations. In view of this, other standards can be used by providers, but it is likely we would consider it reasonable that they bear the additional costs involved.

Next steps

EU legislation provides two routes under which UK providers can secure low termination rates for calls to the EU providers. The first can be satisfied by individual UK telecoms providers, and the second would require the UK Government to make an application to the EU. Should the UK Government decide on this second route, we would support the UK Government as necessary. This may involve revisiting some of our decisions, notably the regulation of the termination rates for 070 numbers at the mobile termination rate.

All of our decisions come into force on 1 April 2021, except our changes to the caps for fixed, mobile and 070 termination charges, which will take effect from 1 June 2021. This is to allow providers time to notify new termination rates where necessary to comply with the new rules.

In addition, BT will have six months to implement our transparency requirements for IP interconnection to publish (1) a reference offer setting our fair and reasonable terms for IP interconnection and (2) information on the quality of service of its provision of interconnect circuits.

2. Summary of decisions

- 2.1 This section summarises the regulatory framework for our review, our assessment of the markets we have looked at, our determinations of significant market power (SMP) and our decisions as to the appropriate remedies.
- 2.2 We have reviewed the following markets:
- the wholesale call origination (WCO) market in the UK (excluding the Hull Area).³ This market was last reviewed in our Narrowband Market Review Statement in November 2017 (2017 NMR Statement);⁴
 - the wholesale call termination (WCT) markets. These markets were last reviewed in the 2017 NMR Statement;
 - the mobile call termination (MCT) markets. These markets were last reviewed in our Mobile Call Termination Market Review Statement (2018 MCT Market Review Statement) in March 2018;⁵ and
 - the 070 termination markets. These markets were last reviewed in a statement in October 2018.⁶
- 2.3 We have also reviewed a direction made in March 2018 under General Condition 18.5 (now General Condition B3.6), which sets a cap on mobile donor conveyance charges (DCC).⁷
- 2.4 As a result of the findings of our market reviews, we have set new SMP conditions and directions, which, in the main, will take effect from 1 April 2021. Where we have considered appropriate, we have allowed a period for the implementation of changes we are introducing.

Legal and regulatory framework

Market review process

- 2.5 Annex 1 provides an overview of the market review process. We have reviewed the markets listed in paragraph 2.2 in three analytical stages of market definition, competition assessment and setting of remedies. In more detail this involves the following considerations:
- we have defined the relevant markets;

³ The Wholesale Call Origination (WCO) market in the Hull Area is addressed in the recent consultation on our review of fixed telecoms in the Hull Area. Ofcom, 2020. [Hull Area Wholesale Fixed Telecoms Market Review 2021-26: Consultation](#) (the 2020 Hull Review Consultation), Volume 2, Section 5. [Accessed 25 March 2021]

⁴ Ofcom, 2017. [Narrowband Market Review: Statement](#) (2017 NMR Statement) [Accessed 25 March 2021]

⁵ Ofcom, 2018. [Mobile Call Termination Market Review 2018-2021: Final Statement](#) (2018 MCT Market Review Statement) [Accessed 25 March 2021]

⁶ Ofcom, 2018. [Personal numbering – Review of the 070 number range: Final Statement](#) (2018 070 Market Review Statement) [Accessed 25 March 2021]

⁷ Ofcom, 2018. [Review of mobile donor conveyance charges for the period 2018 to 2021: Statement](#) (2018 DCC Review) [Accessed 25 March 2021]

- we have assessed whether the markets we have defined meet the three criteria set out in section 79(2B) of the Communications Act 2003 ('the three criteria test')⁸;
- markets which do not satisfy the three criteria test are not susceptible to a market power determination, which would trigger ex-ante regulation;
- for markets which satisfy the three criteria test, we have assessed whether any provider has SMP; and
- where we make a determination of SMP, we identify appropriate remedies, based on the nature of the competition problems affecting the relevant markets.

Forward look

- 2.6 Market reviews look ahead to how competitive conditions may change during the review period. For each relevant market, the review considers whether the three criteria test is met; where the test is met, whether there is SMP; and finally which remedies are necessary to address the SMP we have identified, where competition law is insufficient to address our concerns. For the purposes of this review, for each market we have conducted a forward-looking assessment of the market, taking into account expected or foreseeable developments that may affect competition in the market for the period up to March 2026.
- 2.7 The prospective nature of our assessment over this period means that we are required to gather a range of evidence to assess actual market conditions as well as to produce forecasts that we consider will appropriately reflect developments over time. Where appropriate, we have exercised our regulatory judgment to reach decisions on the evidence before us with a view, ultimately, to addressing the competition concerns we identify in order to further the interests of citizens and consumers in these markets.

Our duties under the Act

- 2.8 Annex 1 also describes our statutory duties and the matters to which we should have regard in the performance of our market review functions under sections 78 – 89 of the Communications Act 2003 (the Act). We consider that our decisions set out in this Statement also meet our duties in section 3 of the Act. This includes our principal duty to further the interests of citizens in relation to communication matters, and to further the interests of consumers in relevant markets, where appropriate by promoting competition.
- 2.9 In performing our duties, we have had regard, in particular, to the desirability of promoting competition in relevant markets, the desirability of encouraging investment and innovation in relevant markets, and to the interests of consumers in respect of choice, price, quality of service and value for money.
- 2.10 We have also had regard to the principles under which our regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases where

⁸ Namely whether there are barriers to entry, the market structure does not tend towards effective competition, and competition law is not sufficient to address any market failures we identify.

action is needed. We consider that our decisions are also consistent with our duties set out in section 4 of the Act.

Strategic Statement position

2.11 As required by section 2B(2) of the Act, we have had regard to the UK Government's Statement of Strategic Priorities (SSP)⁹ for telecoms, management of radio spectrum and postal services. In particular, we have had regard to the following priority areas covered by the SSP: world-class digital infrastructure, furthering the interests of telecoms consumers and ensuring secure and resilient telecoms infrastructure.

Our decisions on market definition, SMP and remedies

Wholesale call termination

Market definition and SMP

2.12 We have defined the WCT market as wholesale call termination services that are provided by a fixed communications provider to another communications provider, for the termination of voice calls to UK geographic numbers in the area served by that fixed communications provider.

2.13 We found that there is a separate market in respect of the termination of voice calls to UK geographic numbers served by each fixed communications provider, in which that fixed communications provider has SMP.

Remedies

2.14 As we set out in section 6 of this Statement, in order to address the SMP in the WCT markets we have identified, we are imposing the following obligations on all WCT providers:

- a network access obligation;
- a charge control (without a price notification obligation) on calls that terminate in the UK on UK geographic numbers; and
- termination rates for calls originating outside the UK to be no more than the reciprocal termination rate charged by the relevant international telecoms provider for a call originating in the UK, or the WCT provider's domestic rate, whichever is the higher.

2.15 Given BT's scale and importance in the provision of WCT, we decided that it is appropriate to impose additional remedies on BT. Therefore, in order to address our competition concerns arising from BT's SMP in the WCT market, we are imposing on BT the following additional obligations in respect of the network access it must give:

- a requirement not to unduly discriminate;

⁹ Department for Digital, Culture, Media and Sport, 2019. [Statement of Strategic Priorities for telecommunications, the management of radio spectrum, and postal services](#) (dated 29 October 2019) (SSP). [Accessed 25 March 2021]

- a requirement to publish a Reference Offer; and
 - accounting separation and cost accounting obligations.
- 2.16 In section 7 of this Statement, we set out our decisions in respect of interconnection and other related services needed for telecoms providers to access WCT. We clarify that the obligation on all WCT providers to provide network access on fair and reasonable terms, conditions and charges applies to interconnection, accommodation and related services which are required to access WCT.
- 2.17 Given BT's SMP in the WCT market, its position as the largest supplier of WCT and the specific nature of its network, we have decided to impose some additional remedies on BT to ensure that our WCT remedies are effective. We have taken into account that BT plans to transfer its fixed line telephone services from its Time Division Multiplex (TDM) network to its internet protocol (IP) network by 2025, before it withdraws its TDM network. We have decided to maintain existing regulation on BT's TDM interconnection which will be gradually withdrawn as BT migrates number blocks from its TDM network to its IP network. We have also decided to impose some regulation on interconnection with BT's IP network to ensure that other providers can get the interconnection they need to terminate calls, on fair and reasonable terms, once BT's number blocks have moved to that network.
- 2.18 We have therefore decided to impose on BT the following obligations:
- a fair and reasonable charges obligation for IP interconnection, which we have supplemented with guidance;
 - a requirement to notify charges;
 - transparency as to quality of service;
 - charge control on TDM interconnect circuits;
 - prohibition of certain additional charges from 1 April 2025 for IP interconnection; and
 - transparency of IP interconnection migration.
- 2.19 BT's plans to transfer its fixed line telephone services to its IP network by 2025 are part of an industry-wide transformation of the telephone network. Other telecoms providers with TDM fixed networks are expected to transfer their fixed line telephone services to IP networks over broadly a similar period. Given BT's position as the largest provider of fixed call termination, BT's plans are a major component of this transition to IP-based telephony services.
- 2.20 We aim to mitigate the risk that delay or uncertainty about BT's migration plans could have a negative impact on competition. In order to give telecoms providers transparency about BT's migration plans, we have therefore decided to impose on BT certain obligations about its migration timetable for transferring geographic number blocks to the Point of Connection (POC) where WCT is made available on its IP network. These obligations include:
- the publication of a migration timetable by no later than 1 June 2022;
 - giving at least 12 months' notice of proposed migration dates;
 - giving at least 90 days' notice of any postponement to a proposed migration date;

- making available WCT via both TDM and IP interconnection for one calendar month following migration of a number block; and
- migration of all number blocks to be complete by 1 April 2025.

Mobile call termination

Market definition and SMP

- 2.21 We have defined the MCT market as mobile call termination services that are provided by a mobile communications provider to another communications provider, for the termination of voice calls to UK mobile numbers in the area served by that mobile communications provider.
- 2.22 We found that there is a separate mobile call termination market in respect of the termination of voice calls to UK mobile numbers served by each mobile communications provider in which that mobile communications provider has SMP.

Remedies

- 2.23 As we set out in section 6 of this Statement, to address our competition concerns and the SMP in the MCT markets we have identified, we are imposing the following obligations on all MCT providers:
- a network access obligation;
 - a charge control (without a price notification obligation) on calls originated in the UK; and
 - termination rates for calls originating outside the UK to be no more than the reciprocal termination rate charged by the relevant international telecoms provider for a call originating in the UK, or the MCT provider's domestic rate, whichever is the higher.

070 termination

Market definition and SMP

- 2.24 We have defined the 070 termination market as the wholesale termination services that are provided to another communications provider by an 070 number range holder for terminating calls to the 070 numbers within the range it holds.
- 2.25 We found that there is a separate 070 call termination market for the termination of calls to 070 numbers held by each 070 number range holder, in which that 070 number range holder has SMP.

Remedies

- 2.26 As we set out in section 10 of this Statement, to address our competition concerns and SMP in the 070 termination markets, we are imposing on all 070 number range holders a charge control, which is set at the same rate as the charge control we have set on termination rates for calls to mobile numbers.

Our decisions on the WCO markets and the DCC direction

- 2.27 We have also reviewed the WCO market.¹⁰ BT has announced that it will withdraw its legacy telephony network (which uses TDM technology) and transition to internet protocol (IP) voice services by December 2025. In addition, Openreach has consulted on plans to withdraw its Wholesale Line Rental (WLR) and ISDN products¹¹ within the same timescale.¹²
- 2.28 We expect telecoms providers who use WLR to switch to using IP-based voice services during the course of the market review period. We therefore expect reliance on WCO from BT to diminish as the review period progresses and the scope for rivals to provide a competitive alternative to increase. As a result of these developments, we have concluded that there are not high and non-transitory barriers to entry in the WCO market and that the market will tend towards effective competition during the review period. The market is therefore not susceptible to regulation under our market review powers. We have therefore revoked the existing SMP conditions which apply to BT in relation to WCO.
- 2.29 We have reviewed the direction we made in 2018 under GC18, which set a cap on Donor Conveyance Charges (DCC). DCC revenues are relatively small, so small changes in DCC are unlikely to have a significant impact on competition or customers. We have therefore decided not to renew the specific control on DCC charges. Providers will still be required to set charges which are cost based under General Condition B3.6.¹³

Equality Impact Assessment

- 2.30 Section 149 of the Equality Act 2010 (the 2010 Act) imposes a duty on Ofcom, when carrying out its functions, to have due regard to the need to eliminate discrimination, harassment, victimisation and other prohibited conduct related to the following protected characteristics: age; disability; gender reassignment; marriage and civil partnership; pregnancy and maternity; race; religion or belief; sex and sexual orientation. The 2010 Act also requires Ofcom to have due regard to the need to advance equality of opportunity and foster good relations between persons who share specified protected characteristics and persons who do not.
- 2.31 Section 75 of the Northern Ireland Act 1998 (the 1998 Act) also imposes a duty on Ofcom, when carrying out its functions relating to Northern Ireland, to have due regard to the need to promote equality of opportunity and regard to the desirability of promoting good relations across a range of categories outlined in the 1998 Act. Ofcom's Revised Northern Ireland Equality Scheme explains how we comply with our statutory duties under the 1998 Act.

¹⁰ Our reasoning and decision in respect of WCO are set out in section 4 of this Statement.

¹¹ Integrated Services Digital Network. A digital telephone service that supports telephone and switched data services.

¹² Specifically, when the PSTN closes, the following Openreach products will no longer work: WLR3 analogue, ISDN 2, ISDN 30, LLU SMPF, SLU SMPF, Narrowband Line Share and Classic products. Openreach, 2018 [Upgrading the Access Network: the withdrawal of WLR products and the smooth transition to IP voice services – consultation](#). [Accessed 25 March 2021]

¹³ Our reasoning and decision in respect of DCC are set out in section 11 of this Statement.

- 2.32 To help us comply with our duties under the 2010 Act and the 1998 Act, we assess the impact of our decisions on persons sharing protected characteristics and in particular whether they may discriminate against such persons or impact on equality of opportunity or good relations.
- 2.33 While our on-going research does show evidence of variation in consumption of fixed voice services, we do not consider that the wholesale regulation in this review is likely to have a disproportionate impact on any of the groups specified above. This is because our regulation is aimed at promoting competition across the range of services for all equality groups that rely on the markets reviewed. In addition, we do not consider that the deregulation of the wholesale call origination market is likely to have a disproportionate impact on any of the groups, in particular given they will continue to be able to purchase a range of services.
- 2.34 Accordingly, we do not consider that our decisions have equality implications under the 2010 Act or the 1998 Act.

3. Background

3.1 In this section, we outline market developments and observed trends in the retail voice market. We then summarise the previous reviews of the wholesale markets that underpin retail services.

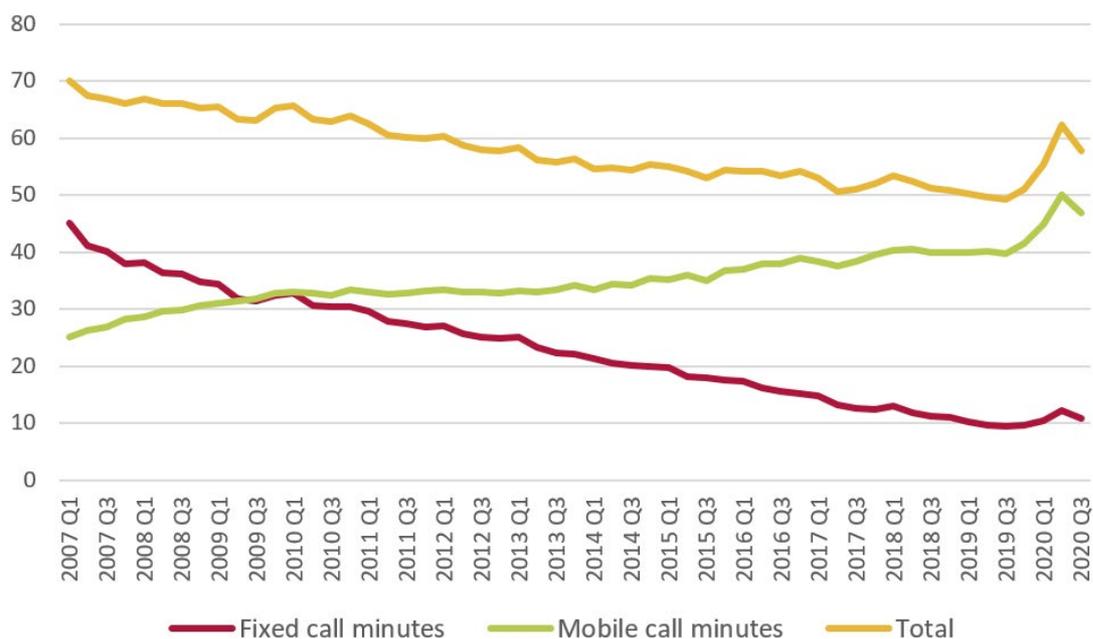
Retail market context

3.2 The past two decades have seen fundamental changes in how consumers communicate. The use of fixed-line telephone services (landlines) has steadily declined, while there have been substantial increases in the use of mobile services, over-the-top (OTT) voice services and messaging services.

Declining use of fixed voice services, while use of alternatives increases

3.3 Outgoing fixed call volumes declined by 71%, from 149 billion minutes in the year to Q3 2008 to 43 billion minutes in the year to Q3 2020.¹⁴ Mobile call volumes increased by 57% over the same period, from 116 billion minutes to 183 billion minutes.¹⁵

Figure 3.1: Mobile- and fixed-originated call volumes (billions of minutes)¹⁶



Source: Ofcom Telecommunications Market Data Update Q3 2020

¹⁴ Fixed Table 3 - 'Summary of call volumes (millions of minutes)'. Ofcom, 2021. [Telecommunications Market Data Update: Q3 2020](#). [Accessed 21 March 2021]

¹⁵ Mobile Table 2 - 'Call and message volumes by call type (billions of minutes/messages/PB)'. Ofcom, 2021. [Telecommunications Market Data Update: Q3 2020](#).

¹⁶ Fixed call volumes are based on Fixed Table 3 - 'Summary of call volumes (millions of minutes)' and mobile volumes are based on Mobile Table 2 - 'Call and message volumes by call type (billions of minutes/messages/PB)'. Ofcom, 2021. [Telecommunications Market Data Update: Q3 2020](#).

- 3.4 Over the last two decades, there has been a marked decline in the use of landlines, and in fixed call revenues. While the total number of UK landlines has remained relatively stable, at 32 million¹⁷, and the majority (78%) of households still have a landline, only 54% of people actually use their landline to make calls.¹⁸
- 3.5 Qualitative research carried out in 2019 by Ofcom¹⁹ on declining calls and changing behaviours suggests customers are making fewer fixed calls for a number of reasons, including increased mobile phone ownership, which now stands at 96% of all UK households²⁰, and the perceived convenience and low cost of using a mobile handset to communicate.²¹
- 3.6 Our research also suggests that consumer perceptions of landlines may have changed, with landlines now being perceived by respondents as outdated, with limited functionality, and poorer value for money compared to mobile services.²² Our research found that while usage of landlines was higher among people over 65, many said that they would migrate to mobile from a landline if they had to.²³
- 3.7 There has also been a notable decline in the use of landlines by businesses, although the exact extent of this is difficult to estimate given limitations in the data we receive from telecoms providers.²⁴ From the information received, the number of business landlines has declined by 44%, from 10.6 million in Q3 2008 to 6.0 million in Q3 2020.²⁵ Businesses are also making fewer landline calls, with call volumes falling 72%, from 48 billion minutes in the year to Q3 2008 to 13 billion minutes in the year to Q3 2020.²⁶
- 3.8 However, landlines remain valued by some. Our research suggests that some residential customers consider landlines to be superior in terms of sound quality and reliability, while also providing them with easy access to an established social network of landline users.²⁷ Some participants that ran micro-businesses did not want to change, as they were worried that the loss of a landline would mean a loss of location identity, and some feared that

¹⁷ Ofcom, 2021. *Telecommunications Market Data Update: Q3 2020*.

¹⁸ Ofcom, 2020. *Technology Tracker 2020*, pages 110 and 117. [Accessed 21 March 2021]

¹⁹ Futuresight was commissioned by Ofcom to research why the volume of landline calls had declined. The research involved in-depth interviews with a cross-section of 52 consumers and 12 micro-business decision-makers across all four UK nations, covering urban, suburban and rural locations. Ofcom, 2020. *Declining call and changing behaviour research 2020* [Accessed 21 March 2021].

²⁰ Ofcom, 2020. *Technology Tracker 2020*, page 110.

²¹ In our qualitative research residential consumers cited a number of key reasons on why their preferences have changed, including: major migration to mobile and OTT platforms; low cost/affordability of mobile services; and sheer ease, convenience and access to mobile as a personal device. For the full list please see the report. Ofcom, 2020. *Declining call and changing behaviour research 2020*.

²² Ofcom, 2020. *Declining call and changing behaviour research 2020*, Section 4.2, page 15.

²³ Our research found that despite usage of landlines being higher in the older age (65+) category, reliance on landline was driven more strongly by habit than by real need or dependence. Many of the participants in this age category claimed they could and would migrate if they had to. Ofcom, 2020. *Declining call and changing behaviour research 2020*, Section 4.2, page 15.

²⁴ This data does not cover the whole business market and does not fully capture managed VoIP use by businesses. The declines noted here may therefore be overstated.

²⁵ Summary of business exchange line numbers – All Operators, Q3 2007 and Q3 2020. Ofcom, 2021. *Telecommunications Market Data Update: Q3 2020*.

²⁶ Summary of business call volumes – All Operators. Ofcom, 2021. *Telecommunications Market Data Update: Q3 2020*.

²⁷ Ofcom, 2020. *Declining call and changing behaviour research 2020*, Section 1.2.1, page 6.

moving to use a mobile number would make customers think their business less trustworthy and reputable.²⁸

- 3.9 In some cases, landlines remain essential, for instance where they support services for vulnerable users (e.g. care alarms) or where there is no reliable mobile coverage or decent broadband connection. In addition, a very small minority of households (3%) have a landline, but no mobile services.²⁹

Use of mobile voice services continues to rise

- 3.10 In contrast to landlines, the use of mobile voice services has continued to rise over the last two decades (Figure 3.1) and mobile call volumes continue to increase year-on-year. Although mobile voice call volumes were flat in 2019, volumes increased by over 18% in the year to Q3 2020 – most likely due to the impact of the Covid-19 pandemic.³⁰
- 3.11 Our qualitative research suggests that many customers perceive mobile minutes (which form an integral part of the offer for pay-monthly mobile phone contracts) as ‘free’ compared to more expensive landline calls, with respondents noting a trend towards contracts with very high or unlimited minutes and texts.³¹

Increasing use of OTT voice services and OTT messaging services

- 3.12 Our recent research found that OTT services are now widely used. For instance, 58% of UK adults use their mobile for instant messaging (using services such as Facebook Messenger, Snapchat, WhatsApp), and 43% use their mobile for OTT voice or OTT video call services.³² WhatsApp is the most frequently used OTT service for voice calls on a daily basis, followed by Facebook Messenger.³³ Our qualitative research suggests that customers choose the service which most suits their needs and/or those of the person they are contacting for each type of communication, and may use multiple services for the same purpose.³⁴ Retailers are tailoring their packages to meet the demand for these OTT services, with some post-pay mobile contracts offering ‘free’ social media use add-ons to their packages

²⁸ Ofcom, 2020. *Declining call and changing behaviour research 2020*. Section 1.2.3, page 7.

²⁹ This figure comes from a combination of two questions: QC1 ‘Is there a landline phone in your home that can be used to make and receive calls?’ and QD1 ‘How many mobile phones in total do you and members of your household use?’. Ofcom, 2020. *Technology Tracker 2020*. pages 105 to 110 and 126 to 128.

³⁰ In Q3 2020 the number of outgoing mobile voice call minutes was 46.9 billion, while in Q3 2019 it was 39.6 billion minutes. Ofcom, 2021. *Telecommunications Market Data Update: Q3 2020*.

³¹ Ofcom, 2020. *Declining call and changing behaviour research 2020*.

³² Ofcom, 2020. *Technology Tracker 2020*, pages 180 and 183.

³³ Our research found that 24% of participants used WhatsApp daily, and that 16% of participants used Facebook Messenger daily for voice calls. Ofcom, 2020. [Ofcom Online Communication Services research February 2020 \(quantitative\)](#) [Accessed 21 March 2021] Base: All respondents who have used online communication services or apps in the past 12 months (1692)

³⁴ Ofcom, 2020. *Declining call and changing behaviour research 2020*.

or offering it as an integral part of their offers to customers, such as with Virgin Mobile³⁵ and VOXI.³⁶

- 3.13 Our qualitative research suggests that instant messaging and SMS services are considered valuable supplements to voice calling, with many respondents now seeing messaging as essential.³⁷ However, the volume of SMS/MMS messages has significantly decreased, driven largely by an increase in the use of OTT messaging services. In the year to Q3 2020, 14 billion fewer SMS/MMS messages were sent than in the year to Q3 2019, reducing by 21%, from 67 billion to 53 billion.³⁸
- 3.14 Online communication services are increasingly being used for regular text messaging, with 73% of UK adult internet users using these services to send messages at least weekly.³⁹ In February 2020, the level of daily WhatsApp usage for text messaging was similar to the daily use of SMS.⁴⁰
- 3.15 For those customers with a disability, our research suggests that smartphones have provided better accessibility to voice services. Features of OTT voice and messaging services such as voice activation for customers with dexterity and sight impairments, instant messaging and read notifications for deaf customers, or video calling for deaf people who use sign language, can provide these customers with much easier access to means of communication.⁴¹

Impact of Covid-19

- 3.16 The UK continues to face the challenges of the Covid-19 pandemic, affecting how people across the UK live, work and communicate. Use of mobile, fixed and OTT voice services increased, peaking in Q2 2020 during the spring lockdown, as many looked for ways to communicate with family, friends and colleagues while staying at home.
- 3.17 The use of mobile voice services increased significantly as a result of Covid-19. In comparison to periods before the spring lockdown (i.e. before 23 March 2020), mobile voice traffic⁴² increased by 10-45% across mobile network operators.⁴³ The average length

³⁵ Virgin Mobile offers 'Data-free socialising' on WhatsApp, Facebook Messenger, and Twitter which allows customers on their pay monthly and sim only subscriptions to message on these apps without contributing to their data cap. Voice and video calls through WhatsApp and Facebook Messenger are excluded. Offer outlined on [Virgin Media's website](#) [Accessed 14 January 2021]

³⁶ VOXI offers customers 'endless' social media use, allowing subscribers use of social media apps without this use being counted as contributing to a customer's data cap. Voice & video calls are not included. The social media apps included are Facebook, WhatsApp, Snapchat, Twitter, Instagram, Facebook Messenger, and Pinterest. Offer outlined on [VOXI's website](#) [Accessed 14 January 2021]

³⁷ Ofcom, 2020. *Declining call and changing behaviour research 2020*.

³⁸ Ofcom, 2020. *Communications Market Report 2020 - Interactive data*, page 16. [Accessed 21 March 2021]

³⁹ Ofcom, 2020. *Online Nation: 2020 Report*, page 144. [Accessed 21 March 2021]

⁴⁰ Ofcom, 2020. *Online Nation: 2020 Report*, page 4.

⁴¹ Futuresight was commissioned by Ofcom to research to better understand customers usage of, and attitudes towards, traditional and online services, and whether customers' needs are currently being served by these services. Futuresight conducted in-depth interviews with a cross-section of 56 consumers, 6 micro-business decision-makers and nine accessibility users across all four UK nations. Ofcom, 2020. *Ofcom Online Communication Services research (qualitative)*.

⁴² Total mobile voice traffic is measured here as total minutes of originated calls.

⁴³ Ofcom, 2020. *Connected Nations 2020: UK Report*, page 32. [Accessed 21 March 2021]

of mobile-originated calls increased from just over three and a half minutes (3 minutes 40 seconds) before the spring lockdown to around five and a half minutes (5 minutes 26 seconds) in the six weeks after the lockdown.⁴⁴

- 3.18 The use of OTT voice and video services also increased, as people have turned to online communications as a way of staying in touch whilst staying at home. In the 12 months to February 2020, 54% of online adults used online voice calling at least weekly. This figure increased to 72% by May 2020.⁴⁵ The percentage of online adults using online video calling at least weekly doubled, increasing from 35% in the 12 months to February 2020 to 71% by May 2020.⁴⁶
- 3.19 Despite the long-standing trend in declining use of fixed voice calls (see Figure 3.1), fixed call volumes increased by 1.7 billion minutes (16%) in Q2 2020, largely as a result of more people being at home due to Covid-19 lockdown measures. These call volumes then fell by 1.4 billion minutes (11%) in Q3 2020, when lockdown restrictions were relaxed.⁴⁷

Related reviews of wholesale voice markets

- 3.20 The delivery of retail voice services is underpinned by the good functioning of the wholesale markets. Our objective is to promote effective competition in wholesale markets to support choice, innovation, better quality services and lower prices for customers in retail markets. In this section we discuss our approaches to reviewing the relevant wholesale markets for voice services.

2017 Narrowband Market Review

- 3.21 In 2017 we published the Narrowband Market Review Statement (the 2017 NMR Statement)⁴⁸ which covered the following five markets: wholesale fixed analogue exchange lines (WFAEL); wholesale ISDN30; wholesale ISDN2; wholesale call origination; and wholesale call termination.⁴⁹ These markets relate to the wholesale inputs which underpin the delivery of fixed voice telephone services.
- 3.22 Wholesale fixed analogue exchange lines are standard fixed lines that are used by residential and business customers. ISDN is a digital exchange line service that supports telephony and some data services. ISDN30 is primarily used by larger businesses which require multiple phone lines. ISDN2 supports two voice or narrowband data channels (such data usage might include card payments or fax machines). These wholesale services are collectively known as narrowband access services. Wholesale call origination (WCO) is a

⁴⁴ Ofcom, 2020. [Mobile matters: Researching people's experience of using Android mobile services](#), page 16. [Accessed 21 March 2021]

⁴⁵ Ofcom, 2020. *Online Nation: 2020 Report*, page 142.

⁴⁶ Ofcom, 2020. *Online Nation: 2020 Report*, page 142.

⁴⁷ Ofcom, 2021. *Telecommunications Market Data Update: Q3 2020*.

⁴⁸ Ofcom, 2017. [Narrowband Market Review: Statement](#) [Accessed 21 March 2021]

⁴⁹ Narrowband refers to services (including telephony and fax) where the bandwidth available is limited by the network to that required to support telephony traffic. It is different to broadband, where services using much higher bandwidth can be supported.

complementary wholesale service which facilitates the provision of outbound telephone calls over these narrowband access services.

- 3.23 Wholesale call termination is a wholesale service for the termination of voice calls to UK geographic numbers (numbers starting 01 and 02). Given that every geographic call to a different network will require the provision of wholesale call termination, regulation of this market is important in supporting effective competition between telecoms providers.
- 3.24 In the 2017 NMR Statement, we found that BT continued to have SMP in the WFAEL, ISDN2, ISDN30 and WCO markets. We therefore decided that regulation of narrowband services was still needed, although we decided to significantly reduce the wholesale regulation that we apply to BT in these markets, based on market analysis undertaken as part of the review.
- 3.25 We also found that all holders of UK geographic numbers had SMP in WCT. We decided to impose a charge control and certain non-pricing remedies on all telecoms providers with SMP in WCT, as well as additional remedies that apply to BT only.

2018 Review of Donor Conveyance Charges

- 3.26 Number portability allows customers to keep their telephone numbers when switching communications providers.
- 3.27 When a mobile subscriber has ‘ported’ their number to another network, calls to that number are, in some cases, first routed to the network that originally held the number. Where that is the case, the call is identified as being made to a ported number and ‘onward routed’ to the mobile provider to which the number has been ported.
- 3.28 The 2018 Review of Donor Conveyance Charges (2018 DCC Review) looked at the wholesale porting charges (known as the donor conveyance charge) that mobile operators charge each other in order to recover certain costs associated with the provision of mobile number portability.⁵⁰ The 2018 DCC Review set the maximum DCC for 2018 – 2021.⁵¹

2018 Mobile Call Termination Market Review

- 3.29 Mobile call termination is a wholesale service provided by a mobile provider that enables other telecoms providers to connect to customers (i.e. call recipients) on its network. When fixed or mobile providers enable their customers to call a UK mobile number, they pay a wholesale charge to the mobile operator which terminates the call. The level of this charge is the mobile termination rate (MTR), set on a per-minute basis.⁵²

⁵⁰ Ofcom, 2018. [Review of mobile donor conveyance charges for the period 2018 to 2021](#) [Accessed 21 March 2021]

⁵¹ BT levies Average Porting Conveyance Charges (APCCs) on other telecoms providers for onward routing of fixed calls for numbers that have been ported to them. The APCCs are based on the costs incurred in the onward routing. These APCCs vary by telecoms provider, depending on the amount of conveyance across BT’s network used to onward route these calls. Industry convention is that costs are to be recovered are spread across all traffic to ported-out numbers.

⁵² Ofcom, 2018. [Mobile Call Termination Market Review 2018-2021: Final Statement](#) (2018 MCT Market Review Statement) [Accessed 21 March 2021]

- 3.30 As every call from one mobile network to a different network will incur a termination rate, regulation of this market is important in supporting effective competition between telecoms providers.
- 3.31 In the 2018 MCT Market Review Statement⁵³, we found that all providers of mobile call services had SMP in mobile call termination. As a result, we required providers to give access to MCT and imposed a charge control on mobile termination rates.

2018 Personal numbering – Review of 070 number range

- 3.32 070 numbers are used for personal or ‘follow-me’ services. When someone calls a 070 number, their telecoms provider pays a wholesale termination charge to the 070 service provider for the call to reach the recipient. The caller is then charged a retail price by their telecoms provider for making that call.
- 3.33 In the 2018 070 Market Review Statement⁵⁴ we found that each 070 provider holding a 070 number range(s) had SMP with respect to the wholesale market for terminating voice calls to 070 numbers. These providers could set very high wholesale termination rates for calls made to their numbers, harming consumers. As a result, we imposed a charge control for the wholesale termination rate charged for calls to 070 numbers, matching the regulated mobile termination rate, which was set in the 2018 MCT Market Review Statement.

2019 Future of interconnection and call termination – First consultation

- 3.34 In 2019 we published an initial consultation (the 2019 First Consultation)⁵⁵ outlining several suggested approaches to the regulation of interconnection and call termination in the forthcoming review period.
- 3.35 We noted that the migration of landlines to newer IP technology has implications for how we regulate telephone services. In particular, we explained how the migration to IP might impact regulation of interconnection between other networks and BT’s local exchanges.

2020 Wholesale Voice Markets Review 2021–2026 – consultation

- 3.36 In August 2020, we published our proposals for the regulation of the wholesale voice markets that underpin landline and mobile telephone calls in the UK (the August 2020 Consultation)⁵⁶: namely, WCO markets in the UK (excluding the Hull area); WCT markets; MCT markets; and 070 termination markets. We also reviewed the current price cap on DCCs. Our proposals are outlined in further detail in the relevant sections below.
- 3.37 We received 18 responses to our August 2020 Consultation, including three follow-up responses made by stakeholders in response to an invitation for further comment in light

⁵³ 2018 MCT Market Review Statement

⁵⁴ Ofcom, 2018. [Personal numbering – Review of the 070 number range](#) [Accessed 21 March 2021]

⁵⁵ Ofcom, 2019. [Future of interconnection and call termination: First consultation](#) [Accessed 21 March 2021]

⁵⁶ Ofcom, 2020. [Consultation: Wholesale Voice Markets Review 2021-26](#) (August 2020 Consultation) [Accessed 21 March 2021]

of the publication of the draft European Commission Delegated Act. All non-confidential responses are published on the Ofcom website.⁵⁷ We have considered the points made by respondents and we address them in the relevant sections of this statement.

Related market reviews of wholesale narrowband markets

Wholesale Fixed Telecoms Market Review 2021-26

3.38 In March 2021, we published the final statement of the Wholesale Fixed Telecoms Market Review 2021-26 (the WFTMR 2021 Statement).⁵⁸ The WFTMR 2021 Statement sets out our decisions for the regulation of the fixed telecoms markets that underpin broadband, mobile and business connections, for the period from April 2021 to March 2026. Of specific relevance to the services reviewed in this statement, the WFTMR 2021 Statement reviews the narrowband access services, WFAEL, ISDN2 and ISDN30 markets, for the 2021-26 review period. We concluded that the three criteria test is not met for any of these markets and have removed existing regulation from the WFAEL, ISDN2 and ISDN30 markets. Separately, Openreach has voluntarily committed to a number of measures to support transition for WLR, wholesale ISDN2 and wholesale ISDN30 product users.⁵⁹

Hull Area Wholesale Fixed Telecoms Market Review 2021-26

3.39 In July 2020, we consulted on the Hull Area Wholesale Fixed Telecoms Market Review 2021-26 (the Hull Review).⁶⁰ The Hull Review looks at the markets for WFAEL, ISDN2/30 and WCO in Hull. It also considers interconnection regulation in the Hull Area. In our consultation, we proposed the deregulation of the WFAEL, ISDN and WCO markets in the Hull Area. We have not yet published our decisions on the Hull Review, but as the regulation of WCO and interconnection in the Hull Area will be considered as part of the Hull Review, these services are not addressed in this statement.

Other related developments

Migration to IP networks

3.40 As mentioned in Section 2, telecoms providers with fixed voice networks in the UK are transitioning from providing telephone services using TDM networks to modern IP networks and are increasingly delivering telephone services over broadband connections, rather than traditional analogue service presentation over copper access networks. This

⁵⁷ Stakeholder responses to the August 2020 Consultation are available at: <https://www.ofcom.org.uk/consultations-and-statements/category-2/2021-26-wholesale-voice-markets-review/nocache?showall=1>.

⁵⁸ Ofcom, 2021. *Statement: Promoting investment and competition in fibre networks – Wholesale Fixed Telecoms Market Review 2021-26* (WFTMR 2021 Statement) [Accessed March 2021]

⁵⁹ Ofcom, 2019. *Letter from Openreach to Ofcom on 'WLR and ISDN2/30 voluntary commitment'* dated 25 November 2019 [Accessed March 2021]

⁶⁰ Ofcom, 2020. *Hull Area Wholesale Fixed Telecoms Market Review 2021-26* [Accessed March 2021]

change is driven by the obsolescence of TDM networks and the new focus on building fibre networks.

- 3.41 The migration will be a significant challenge for the industry. BT has announced its intention to retire its TDM network and move all its allocated geographic phone number blocks to its IP network.⁶¹ The remaining telecoms providers with TDM fixed networks are expected to transfer their fixed line telephone services to IP networks broadly over a similar period to BT.
- 3.42 Openreach is testing its migration to fibre and to IP-based voice services through two trials. The first, in Salisbury, is testing the processes for migrating customers to fibre services and, ultimately, withdrawing copper services. The second, in Mildenhall, will be testing the processes for withdrawing WLR, and migrating customers from legacy copper services to replacement copper services, which will support the delivery of telephony over copper-based broadband connections. We issued a statement on the regulatory changes we put in place to enable Openreach's trials.⁶²
- 3.43 There are also wider commitments to fibre build by Openreach and alternative networks (altnets). Openreach has achieved its target of 4.5 million homes and businesses with full fibre (FTTP) by March 2021⁶³, and has committed to an aim of 20 million by the mid-to-late 2020s.⁶⁴ Virgin Media plans to have its whole network – covering more than 15 million premises – capable of gigabit speeds by the end of 2021.⁶⁵ CityFibre has increased its rollout ambition from 5 million to up to 8 million premises in 285 towns and cities.⁶⁶ Hyperoptic is pursuing a target of rolling out its full-fibre network to 2 million premises (both residential and business) by the end of 2021 and 5 million by 2024.⁶⁷
- 3.44 The migration to IP-based services and fibre connections will enable customers to benefit from innovations in voice services and more reliable, faster broadband connections. However, industry will need to ensure that customers' migration is managed smoothly and that vulnerable consumers are protected.
- 3.45 In February 2019, we set out the roles and responsibilities of different organisations, and our expectations of telecoms providers to ensure a smooth migration to IP.⁶⁸ Those measures are focused on the needs of vulnerable consumers, including those dependent on a landline and on telecare services, and on addressing the potential implications for security alarms, payment terminal, monitoring systems and Critical National Infrastructure

⁶¹ BT has shared a presentation entitled 'All-IP Migration Interconnect Charging Update: phase 2 Number Block Migrations' (dated 12 May 2020) with us as well as other telecoms providers, which confirm its plan to move all of its allocated geographic phone number blocks to its IP network.

⁶² Ofcom, 2019. [Statement: Measures to support Openreach's trials in Salisbury and Mildenhall](#) [Accessed March 2021]

⁶³ BT, 4 February 2021. [Results for the nine months to 31 December 2020](#), [Accessed 4 March 2021]

⁶⁴ ISP review, 2021. [Openreach Delivers FTTP Broadband to 4.5 Million UK Premises](#) [Accessed 25 March 2021]

⁶⁵ Virgin, 10 November 2020. [Three things you need to know about Virgin Media's gigabit broadband](#) [Accessed 13 December 2020]

⁶⁶ CityFibre, 2021. [Nationwide Full Fibre Rollout Programme](#) [Accessed 17 March 2021]

⁶⁷ Ofcom, December 2020. [Connected Nations Report 2020](#), page 16. [Accessed 13 January 2021]

⁶⁸ Ofcom, 2019. [The future of fixed telephone services](#) [Accessed 23 March 2021]

(CNI) which use the PSTN. Broadly, the same expectations apply to migration to fibre connections.⁶⁹

- 3.46 In June 2020, we formally commissioned the Office of the Telecoms Adjudicator (OTA2) to secure agreement on a best practice guide for migration in the trial areas, which has now been published.⁷⁰ This includes the definition and identification of vulnerable consumers, protections for users of care alarms, issues around CNI and communications/common messaging. The guide is being tested via the Salisbury trial. We are conscious that the guide will continue to be developed as lessons are learnt from the trials and the OTA2 has consulted with industry on the principles which underpin this further development.

Retail voice-only commitments

- 3.47 Since April 2018, the prices which the majority of customers pay for their voice-only service have been protected through BT's voluntary commitments. We recently accepted a further set of voluntary commitments from BT, which include an inflation cap on increases to line rental and call charges for voice-only products (with increases to line rental itself capped to inflation plus 2.5%). These commitments will ensure continued price protection for BT's voice-only customers until March 2026.⁷¹

⁶⁹ We set those out in our consultation on the Salisbury trial. Ofcom, 2019. [Promoting competition and investment in fibre networks: Measures to support Openreach's proposed trial in Salisbury](#) [Accessed 23 March 2021]

⁷⁰ OTA2, 2020. [Trial Best Practice Guide](#) [Accessed 23 March 2021]

⁷¹ Ofcom, 2020. [Statement: Protecting voice-only landline telephone customers](#) [Accessed 26 March 2021]

4. Wholesale Call Origination

- 4.1 This section describes the product and geographic markets in relation to Wholesale Call Origination in the UK excluding the Hull Area and considers whether the three criteria set out in subsection 79(2B) of the Act are met.⁷²
- 4.2 Wholesale call origination is the wholesale service that enables calls to be made (rather than simply received) over telephone lines. The WCO service enables calls to be originated from wholesale lines and conveyed to the closest point in the network where those calls can be accessed by another telecoms provider.⁷³
- 4.3 Having considered stakeholder responses, we have decided that the three criteria set out in subsection 79(2B) of the Act are not met and accordingly Ofcom may not identify WCO as a market for the purpose of considering whether to make or review a market power determination. Consequently, we have decided to remove all SMP regulation from BT in relation to the supply of WCO in the UK excluding the Hull Area. We have also decided that we do not need to impose any transitional measures.

Background

- 4.4 In the 2017 NMR Statement we defined the relevant product market as the wholesale service that enables voice calls over a fixed narrowband network (i.e. WFAEL, ISDN2 or ISDN30).⁷⁴ As of 2017, the number of calls made over fixed lines had been falling for many years and increasingly residential and business customers were using alternative options to make voice calls – mobile phones and newer IP-based voice services including OTT calls from smartphones. Our review found that while these alternative services increasingly acted as a competitive constraint for some types of calls, and for some customers, they were not yet in the same market as fixed line voice calls. We therefore identified a separate market for WCO. We defined geographic markets for the UK excluding the Hull Area and, separately, the Hull Area.
- 4.5 Given this development of fixed voice competition and the availability of alternative options for many customers, in 2017 we imposed a lighter remedies package on BT in the WCO market than had previously been in place. In particular, we introduced a requirement for WCO charges to be fair and reasonable (in place of a cost-based charge control) and removed the no undue discrimination obligation on BT. We retained remedies that

⁷² As set out in more detail in Annex 1, when reviewing a market, Ofcom is required to consider whether the three criteria set out in subsection 79(2B) of the Act are met. Where Ofcom does not consider that the three criteria are met, it may not identify a market for the purposes of making a market power determination.

⁷³ In addition to WCO, providers of fixed voice services also need wholesale access to a telephone line (WFAEL) and a wholesale service that allows the call to be terminated at the call recipient (WCT and MCT). The provision of Wholesale Fixed Access Exchange Lines (WAFEL) was considered as part of the Wholesale Fixed Telecoms Market Review. We review the markets for Wholesale Fixed Call Termination (WCT) and Mobile Fixed Termination (MCT) in section 5 of this statement.

⁷⁴ We described these services in the background section. Wholesale fixed analogue exchange lines (WFAEL) are standard telephone lines (with analogue service presentation) that are used by residential and business customers. ISDN is a digital telephone service that supports telephone and switched data services.

required BT to provide network access on reasonable request to ensure that competing providers were able to offer call services to retail customers.

- 4.6 Since the 2017 NMR Statement, BT has announced that it will switch off its TDM network and transition to IP voice services by December 2025, i.e. before the end of this review period. In parallel, Openreach has consulted on plans to withdraw its WLR and ISDN products within the same timescale.⁷⁵ This has some important implications for the WCO market which we discuss below.

Our consultation proposal was to remove SMP regulation for WCO

- 4.7 In our August 2020 Consultation we provisionally concluded that the three criteria test would not be met in a market consisting of wholesale voice call origination on wholesale fixed access exchange lines (WFAEL) and Integrated Services Digital Network (ISDN2 and ISDN30) lines in the UK excluding the Hull Area. We expected high barriers to entry in the supply of WCO would fall away, and that the market would tend towards effective competition, as the market moves to IP technology for the delivery of voice calls over the review period.
- 4.8 Consequently, we proposed that the three criteria test would no longer be met in relation to WCO and that this market would not be susceptible to *ex ante* regulation. We also noted that BT has decided to offer voluntary commitments in relation to WCO, corresponding to those offered by Openreach in relation to WLR and ISDN.⁷⁶ Our provisional conclusion was in line with our finding in the WFTMR January 2020 consultation that the three criteria test was not met in the WFAEL and ISDN markets.

Stakeholder responses

- 4.9 BT⁷⁷, Virgin Media⁷⁸, FCS⁷⁹, and Telecom2⁸⁰ agreed with our proposal not to regulate the WCO market on the basis that it no longer fulfils the three criteria test. Virgin Media, FCS and Telecom2 said it was important to monitor BT's compliance with its voluntary commitments.
- 4.10 TalkTalk agreed that the three criteria test for WCO is not met. However, it said that Ofcom should provide more evidence to support its provisional position not to include either calls made from mobile phones or calls made using Over The Top (OTT) services. It said that the fact that the price of fixed line voice services rose at the same time as the price of mobile voice minutes declined is a somewhat narrow evidentiary basis. It also pointed out that

⁷⁵ Specifically, when BT closes its TDM network, the following Openreach products will no longer work: WLR3 analogue, ISDN 2, ISDN 30, LLU SMPF, SLU SMPF, Narrowband Line Share and Classic products. Openreach, 2018. *Upgrading the Access Network: the withdrawal of WLR products and the smooth transition to IP voice services – consultation*.

⁷⁶ August 2020 Consultation, paragraph 4.37.

⁷⁷ BT response to the August 2020 Consultation, page 4.

⁷⁸ Virgin Media response to the August 2020 Consultation, page 2.

⁷⁹ FCS response to the August 2020 Consultation, page 2.

⁸⁰ Telecom2 response to the August 2020 Consultation, page 2.

mobile and OTT call volumes have increased since 2017, whilst fixed line call volumes declined.⁸¹

- 4.11 UKCTA said that BT's voluntary commitments to 'fair and reasonable' prices could lead to large price increases, as BT itself would be able to interpret the meaning of 'fair and reasonable'. UKCTA said that Ofcom should cap WCO charges at CPI+0%.⁸²
- 4.12 Magrathea said that there is currently no meaningful alternative to WCO and that there are still many challenges to overcome before WLR closure (including lack of public awareness around the changes and a lack of clarity on how voice only customers will be served). Magrathea said that Ofcom should keep at least a base level of regulation over WCO until there is greater certainty.⁸³
- 4.13 Vodafone said that some end users are still dependent on their landlines and that absent any meaningful pricing safeguards there will be little incentive on BT to price WCO at a reasonable level. It said that Ofcom should implement a +CPI cap on prices for BT's Carrier Pre Select service up to September 2023.⁸⁴

Our reasoning and decisions

Developments in the WCO market

- 4.14 There are a number of ways in which voice calls can be provided over a fixed line and there are several providers of WCO in the UK. BT supplies WCO services over its TDM network to providers that use Openreach's WLR and ISDN products to provide access to the line over which the calls are provided.⁸⁵ This includes BT's own retail business as well as some other telecoms providers. Sky and TalkTalk (which use local loop unbundled services, LLU) and Virgin Media (which uses a cable network) mostly use their own networks to provide fixed voice services to customers.⁸⁶ They therefore generally provide their own wholesale call origination services.
- 4.15 When BT switches off its TDM network, providers that currently use WLR or ISDN from Openreach, and WCO from BT, will need to change the way they supply voice services to customers as they will no longer be able to use WLR or ISDN. Voice services over the Openreach network will be carried over a broadband connection rather than a dedicated

⁸¹ [TalkTalk](#) response to the August 2020 Consultation, page 1, paragraphs 2.2 – 2.6.

⁸² [UKCTA](#) response to the August 2020 Consultation, pages 5 – 6, paragraphs 20 – 22.

⁸³ [Magrathea](#) response to the August 2020 Consultation, pages 1 – 2.

⁸⁴ [Vodafone](#) response to the August 2020 Consultation, page 27.

⁸⁵ ISDN services are digital telephone services that supports telephone and switched data services. WLR services are those which support the provision of analogue telephony.

⁸⁶ Sky and TalkTalk have their own networks but make use of Openreach's network to provide a connection between the local exchange and the end user's premises (Wholesale Line Access). While these LLU networks ultimately rely on upstream inputs from Openreach, for the purposes of our WCO market evaluation we assume that regulated access to the Wholesale Local Access inputs is in place, and treat Sky and TalkTalk as independent competitors to Openreach in WCO. We considered the markets for Wholesale Local Access in Volume 2 of the WFTMR 2021 Statement. Ofcom, 2021. [Wholesale Fixed Telecoms Market Review](#) [Accessed 25 March 2021]

analogue telephone network. Providers will also need a suitable IP-based voice service in order to carry voice calls over those connections.⁸⁷

- 4.16 Broadband access products that can carry IP voice services, are already available. Broadband access lines fall within the Wholesale Local Access (WLA) markets and regulation of these connections was recently considered as part of the WFTMR 2021 Statement.⁸⁸
- 4.17 Providers will need to develop their own IP-based voice service or purchase a service from an existing supplier in order to be able to offer a voice service over broadband connections. We expect the widespread launch of managed IP-based voice services by a range of telecoms providers over the course of this review period.
- 4.18 Once providers that currently use WLR and WCO, or ISDN and WCO, have switched to using broadband access and IP-based voice services, they will be able to provide their own voice origination services and will no longer need to buy WCO from BT.

Market Definition

Product market

- 4.19 In our consultation we proposed that voice calls originated over WFAEL (which includes lines using WLR, MPF, cable, FTTP with an analogue telephone adaptor (ATA) and IP-based fixed voice services) and voice calls originated over ISDN should be included in the relevant product frame of reference.
- 4.20 In previous reviews we have found that customers are not willing to substitute in sufficient numbers to alternatives such as mobile or OTT services⁸⁹ in response to a small but significant change in the price of fixed calls. Consequently, we have defined narrow product markets that exclude these alternatives.
- 4.21 As noted in section 3, fixed call volumes have continued to decline since 2017. There were 39 billion minutes of fixed-originated calls in 2019, a reduction of 26% from 2017.⁹⁰ 78% of households had a landline in 2020, down from 82% in 2017.⁹¹
- 4.22 There are signs that use of alternative methods of communication has continued to grow throughout the UK. There were 161 billion minutes of mobile calls in 2019, an increase of

⁸⁷ Instead of carrying an analogue voice signal over a dedicated telephone network, IP based voice services convert the voice signal into data which can be carried over a multipurpose broadband network. From an end user perspective, the service will look very similar to their analogue landline as they will still make and receive calls by dialling a telephone number and will experience a similar or better line quality when compared to an analogue telephone service.

⁸⁸ Volume 2 of the Wholesale Fixed Telecoms Market Review Statement, Ofcom, March 2021.

⁸⁹ Over the top (OTT) voice services allow calls to be made via an app over the public internet. They include services such as WhatsApp and Skype. They differ from fixed and mobile telephone services in that they do not use a dedicated fixed or mobile network and because they do not use telephone numbers.

⁹⁰ Ofcom, 2020. [Telecommunications Market Data Update 2020 Q3](#), CSV file, Table 3: Summary of call volumes. [Accessed 25 March 2021]

⁹¹ Ofcom, 2020. [Ofcom Technology Tracker 2020](#), Table 27 QC1: Is there a landline phone in your home that can be used to make and receive calls? [Accessed 25 March 2021]. Ofcom, 2017. [Ofcom Technology Tracker 2017 H1](#), Table 21. [Accessed 25 March 2021]

5% from 2017.⁹² The proportion of households that have a mobile, but no landline, increased from 18% in 2017 to 22% in 2020.⁹³ The use of OTT voice services has also been increasing over the last few years, with the percentage of people that have ever used an OTT voice service growing from 55% in 2017 to 66% in 2020.⁹⁴

- 4.23 In response to TalkTalk, we do not consider that this pattern of volume changes is sufficient evidence to show that the relevant market should be widened to include mobile or OTT voice services; to conclude that there is a wider market we would need evidence that sufficient consumers would substitute from fixed voice services to mobile and/or OTT to render a small increase in the price of fixed voice services unprofitable.
- 4.24 The price of using a mobile phone to make calls has been falling for some time. The weighted average cost of using a mobile has fallen from £15.60 per month in 2016 to £12.57 per month in 2019, despite an increase in the average number of calls made and the amount of data used.⁹⁵ The price of mobile calls made outside of call bundles remains high⁹⁶, however, the increasing availability and take-up of mobile services with unlimited voice/text bundles and high inclusive data allowances has meant that out-of-bundle use is becoming less common.⁹⁷ OTT services such as WhatsApp remain available without users needing to incur charges.
- 4.25 Despite the falling price of mobile voice services, and consumers' increasing familiarity with OTT voice services, the prices of fixed voice services have remained relatively stable or have increased. Line rental charges have remained stable or have increased, although line rental charges will have reduced for some landline only customers as a result of the commitment BT made in 2017 to reduce line rental charges for its standalone voice customers by £7 per month.⁹⁸ The price of fixed call bundles and out of bundle calls has increased in recent years.⁹⁹
- 4.26 This indicates that mobile, OTT and other alternatives to making calls over a landline are placing less constraint on the price of making fixed calls at the retail level than the volume movements might suggest. Wholesale customers would also be unlikely to substitute to these alternatives in the event of a small but significant non-transitory increase in price (SSNIP) in the price of WCO. Accordingly, notwithstanding the clear trend towards greater

⁹² Ofcom, 2020. [Telecommunications Market Data Update 2020 Q3](#), CSV file, Mobile Table 2: Call and message volumes by call type. [Accessed 25 March 2021]

⁹³ 'Mobile only' responses to Tech Tracker Question QC1: "Is there a landline phone in your home that can be used to make and receive calls?". Ofcom, 2017. [Ofcom Technology Tracker 2017 H1](#), Table 21. Ofcom, 2020. [Ofcom Technology Tracker 2020](#), Table 27.

⁹⁴ "Yes" responses to Tech Tracker Question QE30: "Have you or anyone in your household ever used one of these services to make voice or video calls using the internet at home?". In 2020 "these services" being explained as services such as Skype Facetime, WhatsApp and Facebook Messenger, while in 2017 2017 'Skype' was the only example used to explain 'these services'. It should also be noted that in 2020 the response to Question QE30 was calculated by combining responses to questions D28A and E5A. [Ofcom Technology Tracker 2017 H1](#), Table 103. [Ofcom Technology Tracker 2020](#), Table 76.

⁹⁵ Ofcom, 2019. [Pricing Trends for Communications Services in the UK](#), figure 20. [Accessed 25 March 2021]

⁹⁶ Ofcom, 2019. [Pricing Trends for Communications Services in the UK](#), figure 22.

⁹⁷ Ofcom, 2019. [Pricing Trends for Communications Services in the UK](#), page 31.

⁹⁸ Ofcom, 2019. [Pricing Trends for Communications Services in the UK](#), figure 31.

⁹⁹ Ofcom, 2019. [Pricing Trends for Communications Services in the UK](#), figure 32.

use of mobiles and OTT services, we have therefore decided not to expand the product frame of reference to include them.

- 4.27 Given this, we have decided to use the product market set out in our consultation as a frame of reference in assessing whether the three criteria test is met, so as to consider whether to make a market power determination in the supply of WCO.¹⁰⁰
- 4.28 This means that that voice calls originated over WFAEL (which includes lines using WLR, MPF, cable and FTTP with an analogue telephone adaptor (ATA)) are included in the relevant product market as are calls originated over ISDN lines. As we set out in the WFTMR 2021 Statement and our August 2020 Consultation we expect that IP-based voice services will form part of the WFAEL and WCO markets as the major providers migrate to IP-based voice as their main technology for supplying voice services to customers.¹⁰¹ We are therefore including IP-based voice services provided over broadband access lines within the relevant product market.

Geographic market

- 4.29 In our consultation we proposed that the relevant geographic frame of reference should be the UK excluding the Hull Area. None of our stakeholders commented on this part of our analysis.
- 4.30 WCO is very closely related to the underlying access product that is used to carry the calls and so our assessment of geographic market definition for WFAEL and ISDN respectively are also relevant for WCO. In our recent WFTMR 2021 Statement, we considered a WFAEL market comprising the UK excluding the Hull Area and an ISDN market comprising the UK excluding the Hull Area.
- 4.31 Having considered stakeholder responses, having regard to the EC SMP Guidelines and in light of the conclusions in the WFTMR 2021 Statement regarding WFAEL and ISDN, we consider that a single market for WCO in the UK excluding the Hull Area is an appropriate frame of reference to consider the three criteria test.

Three criteria test

- 4.32 As set out in more detail in Annex 1, Ofcom must consider whether the three criteria set out in subsection 79(2B) of the Act are met before assessing whether to make a market power determination. Where Ofcom does not consider that the three criteria are met, it may not identify a market for this purpose.
- 4.33 In identifying a market, Ofcom may have regard to various recommendations or guidelines published by the European Commission, including the 2020 EC Recommendation. The

¹⁰⁰ We note that, where a narrower product market does not pass the three criteria test, a wider product market definition that included additional sources of competition would also be unlikely to pass the three criteria test.

¹⁰¹ The WFTMR 2021 Statement, Volume 2 Section 9.

WCO market is not listed in the 2020 EC Recommendation as a market in which ex ante regulation may be warranted.¹⁰²

- 4.34 We have also had regard to our statutory duties, which include an obligation to carry out our functions with a view to securing that regulation does not involve the imposition or maintenance of regulatory burdens that are unnecessary.¹⁰³
- 4.35 In the 2017 NMR Statement, we found that the three criteria test was satisfied in the market we identified for the supply of WCO. As part of this review, we have assessed whether the factors on which this finding was based will continue to be present for the duration of the next review period in relation to the WCO market identified in this review.

High and non-transitory barriers to entry

- 4.36 In the 2017 NMR Statement we found this criterion was satisfied on the basis of the following factors:
- the high costs of building a sufficiently large direct access network;
 - the historical reliance by some telecoms providers on WLR and WCO to supply voice services to certain types of customers (e.g. business customers, fixed voice only customers and customers outside the network reach of cable and LLU networks) which suggested it has not been cost effective or feasible to use MPF or cable to supply these customers; and
 - although there may be scope for a greater role for rivals to provide a competitive alternative for WLR and WCO, substitution of this type was not of sufficient likelihood and scale to eliminate the high barriers to entry.
- 4.37 We do not expect these factors to hold true for the duration of the review period. With the closure of BT's TDM network and the withdrawal of Openreach's WLR and ISDN products, providers offering voice services to customers will need to turn to new methods of supply (i.e. broadband access connection and IP-based voice services) over the course of the review period.
- 4.38 We expect significant growth in the use of IP-based voice services as customers who value voice services at a fixed location are migrated to IP-based voice services. Once that transition has taken place, providers will be able to provide their own wholesale call origination services, or buy in those services from third parties, without the need to buy WCO from BT.
- 4.39 We expect the widespread launch of IP-based voice services during the review period. Effective competition in the supply of broadband access will be an important enabler of

¹⁰² Note, retail access to the public telephone network at a fixed location for residential and non-residential customers was previously identified as a market susceptible to ex ante regulation in the 2007 EC Recommendation but not in the 2014 EC Recommendation which superseded it.

¹⁰³ Section 6 of the Act.

this change and the broadband access lines that carry IP-based voice services are regulated as part of our WFTMR 2021 Statement.¹⁰⁴

- 4.40 We therefore expect reliance on WCO from BT to diminish as the review period progresses and scope for rivals to provide a competitive alternative increases. As a result of these developments, we have concluded that there are not high and non-transitory barriers to entry in the voice services falling within our frame of reference.

Market structure that does not tend towards effective competition in the relevant time horizon

- 4.41 In the 2017 NMR Statement we found that barriers to entry were high and persistent in the supply of WCO in the UK excluding the Hull Area; we also found that the market structure did not tend towards effective competition. While mobile and OTT services were likely to offer increasing competitive pressure, over that review period, we said that they did not yet offer a sufficient constraint on WCO. We said that a significant number of customers were served by telecoms providers reliant on BT's WCO, observing that BT's market share, although declining, was still high (48% in Q4 2016/17).
- 4.42 As set out above, in this review period, we expect to see material changes in the structure of competition in the supply of WCO. We expect a decline in the number of WLR and ISDN lines as BT's TDM network is switched off and as WLR and ISDN products are discontinued. The services that will replace those provided over BT's TDM network will be supplied by other providers and we expect significant growth in the use of IP-based voice services as customers who value voice services at a fixed location are migrated to all-IP services. On this basis the voice services within our frame of reference will, therefore, tend towards effective competition over the review period.

The insufficiency of competition law alone to adequately address the market failure(s) concerned

- 4.43 The three criteria tests are cumulative, and all three criteria need to be satisfied for a market to be susceptible to *ex ante* regulation. Given that the first two criteria are not met we have not considered this criterion further.

Conclusion to market analysis

- 4.44 In light of the expected developments during the review period, our forward-looking assessment in relation to the supply of WCO finds that the relevant market does not meet two of the three criteria in subsection 79(2B) of the Act and therefore, in accordance with subsection 79(2A) of the Act, it is not susceptible to a market power determination and new *ex ante* SMP regulation in the supply of WCO.

Transitional arrangements

- 4.45 We have also considered whether it might be necessary to impose transitional regulation on BT in relation to the supply of WCO during the interim period pending the switch off of

¹⁰⁴ We have set out our regulation of the WLA markets in the WFTMR 2021 Statement.

BT's TDM network and the widespread launch of managed IP-based voice services. While the market we have identified in relation to WCO is no longer susceptible to *ex ante* regulation, there remains a substantial number of end users that are supplied over BT WLR and ISDN lines and it will take time for providers to migrate all of their customers onto IP-based voice services. Some telecoms providers will therefore be reliant on the supply of WCO from BT, while migration takes place, so that they can continue to provide outbound calls.¹⁰⁵

4.46 BT has offered voluntary commitments in relation to WCO, corresponding to those offered by Openreach in regard to WLR and ISDN for the purposes of copper retirement.¹⁰⁶ BT's commitments are to:

- continue to provide WCO, over WLR and ISDN2/30, to new telecoms providers until September 2023 and to existing telecoms providers (including any new telecoms providers served up to September 2023) until December 2025;
- continue to provide network access with respect to WCO products on fair and reasonable terms; maintain a published reference offer; and notify changes to terms and conditions on the same basis as now;
- in relation to charges in particular, price WCO on a fair and reasonable basis until withdrawal i.e. on wholesale terms that do not distort downstream competition by squeezing margins; and
- consider the interests of vulnerable end-users when setting WCO prices.

4.47 We agree with Virgin Media, FCS and Telecom2 that it will be important for BT to comply with these commitments so that providers that are temporarily reliant on WCO can continue to compete effectively while they are moving to IP based voice.

4.48 We do not agree with UKCTA and Vodafone that a CPI-based price cap should be in place for the transition period. As noted above we removed a price cap on WCO and replaced it with a requirement for fair and reasonable prices in the 2017 NMR Statement. Imposing a CPI cap would go further than is necessary to address our competition concerns. A CPI cap would also dampen the incentive on telecoms providers to prepare for the withdrawal of WCO from 2023.

4.49 Having regard to BT's voluntary commitments, and our wider statutory duties to remove regulation where it is no longer required, we have therefore decided not to impose such transitional provisions.

¹⁰⁵ Ofcom has power under subsection 46 (8A) of the Act to treat a person whom it has previously determined to be a person having significant market power as continuing to do so for so long as Ofcom considers necessary to ensure a sustainable transition for those benefitting from obligations imposed on that person as a result of the previous determination.

¹⁰⁶ Openreach, 2019. [Letter to Ofcom on WLR and ISDN2/30 voluntary commitment](#) [Accessed 25 March 2021]

5. WCT and MCT market definition and SMP assessment

- 5.1 In this section we consider market definition and market power in relation to wholesale call termination (WCT) and mobile call termination (MCT), using the framework described in Annex 1.
- 5.2 The relevant conditions in these markets in this review period will remain largely unchanged since our decisions on these issues in the 2017 NMR Statement and 2018 MCT Market Review Statement. We have taken a similar approach to market definition as in those reviews.
- 5.3 In relation to WCT, we have decided that the relevant markets are:
“wholesale call termination services that are provided by [named fixed communications provider](FCP) to another communications provider, for the termination of voice calls to United Kingdom geographic numbers in the area served by that FCP.”
- 5.4 In relation to MCT, we have decided that the relevant markets are:
“termination services that are provided by [named mobile communications provider](MCP) to another communications provider, for the termination of voice calls to UK mobile numbers in the area served by that MCP.”
- 5.5 We are satisfied that the WCT markets and MCT markets continue to meet the three criteria test and so remain susceptible to ex ante regulation.
- 5.6 Based on the above, we have identified a total of 188 separate markets for wholesale WCT services and a total of 65 separate markets for wholesale MCT services. We have decided that each telecoms provider has SMP within the relevant market applicable to that provider, i.e. in relation to the numbers for which they provide termination services.¹⁰⁷

Market definition and three criteria test

Our proposals

- 5.7 In our August 2020 Consultation we proposed that there were separate relevant markets for termination services for fixed and for mobile calls.
- 5.8 We said in relation to WCT that conditions are different for mobile call termination and for termination of non-geographic numbers.¹⁰⁸ As such, in our view, it was not appropriate to consider termination to mobile and non-geographic numbers to be part of the same product market.

¹⁰⁷ The WCT and MCT providers that we have identified as having SMP are listed in the relevant notifications of the SMP conditions we are imposing on them at Annex 5.

¹⁰⁸ When we refer to non-geographic numbers in the context of WCT, we exclude mobile numbers.

- 5.9 We said in relation to MCT that there are no sufficiently close substitutes at the retail level to broaden the retail market beyond calls to a specific UK mobile number. We also said that OTT is not a sufficient constraint to broaden the market and that there are also no sufficiently close substitutes at the wholesale level to broaden the market at the wholesale level.
- 5.10 For both WCT and MCT:
- For hosted numbers¹⁰⁹, we proposed to define the market in relation to the number range holder.
 - With respect to ported numbers¹¹⁰, we proposed that both the donor provider as well as the recipient provider should be considered as providing a termination service.

Stakeholder responses

- 5.11 Most respondents to our proposals on the market definition for WCT agreed with our assessment (BT¹¹¹, the FCS¹¹², Magrathea¹¹³, TalkTalk¹¹⁴, Telecom2¹¹⁵, and Vodafone¹¹⁶). Simwood disagreed with our view that the number range holder retains ultimate control over the number range and said that it is the hosting provider that sets the termination rate in practice.¹¹⁷
- 5.12 Most respondents agreed with our market definition in relation to MCT (FCS¹¹⁸, Magrathea¹¹⁹, TalkTalk¹²⁰, Telecom2¹²¹, Telefonica¹²², and Vodafone¹²³). However, BT disagreed with our proposed market definition for MCT.¹²⁴ BT said that for some types of calls, such as international calls that are priced higher relative to other call types, any increase in the retail price from these levels due to the SSNIP could result in substitution to OTT calls. In BT's view, calls to mobiles may sit within a wider product market including OTT calls and potentially other forms of communication on social media (e.g. Facebook, Instagram, and instant messaging apps).

¹⁰⁹ A number range holder may not always control its own access network and may instead choose to purchase some, or all of the network elements required to physically terminate the call from another telecoms provider. We refer to such arrangements as hosting, the range holder using such services as a hosted provider and the telecoms provider providing the services as the hosting provider.

¹¹⁰ Under a process known as "porting", when customers change network they can take their current mobile number with them.

¹¹¹ [BT](#) response to the August 2020 Consultation, page 9.

¹¹² The [FCS](#) response to the August 2020 Consultation, pages 2-3.

¹¹³ [Magrathea](#) response to the August 2020 Consultation, at page 2.

¹¹⁴ [TalkTalk](#) response to the August 2020 Consultation, page 2, paragraphs 3.2 and 3.3.

¹¹⁵ [Telecom2](#) response to the August 2020 Consultation, page 2.

¹¹⁶ [Vodafone](#) response to the August 2020 Consultation, page 27.

¹¹⁷ [Simwood](#) response to the August 2020 Consultation, pages 5-6.

¹¹⁸ The [FCS](#) response to the August 2020 Consultation, page 3.

¹¹⁹ [Magrathea](#) response to the August 2020 Consultation, page 2.

¹²⁰ [TalkTalk](#) response to the August 2020 Consultation, page 3, paragraph 4.2.

¹²¹ [Telecom2](#) response to the August 2020 Consultation, page 2.

¹²² [Telefonica](#) response to the August 2020 Consultation, page 4, paragraph 2.1.

¹²³ [Vodafone](#) response to the August 2020 Consultation, page 27.

¹²⁴ [BT](#) response to the August 2020 Consultation, pages 9-10.

Our reasoning and decisions

5.13 Both WCT and MCT are concerned with the termination of voice calls and, as such, there are shared features, which are relevant to our assessment of market definition in each case. Accordingly, in considering the relevant market definitions and SMP determinations in respect of WCT and MCT, we first set out the points which apply to both, before setting out our decisions in relation to WCT and MCT separately. In making our assessment of market definition, we have had regard to the EC SMP Guidelines.

Features of call termination relevant to market definition for both WCT and MCT

Demand-side substitution at the retail level

- 5.14 The purpose of a voice call is to contact a specific person, business or organisation. Therefore, the opportunities for demand-side substitution are limited to alternative methods of contacting that specific intended recipient.
- 5.15 In terms of the demand response at the retail level, for alternative methods of contact to make a small but significant non-transitory increase in price (SSNIP) unprofitable would require:
- the originating provider to respond to an increase in termination rates by increasing its retail prices;
 - callers to be aware of this price increase;
 - callers responding to this increase in retail prices by using other services to contact the recipient party and/or ceasing to contact that recipient as frequently; and
 - this substitution to be of an extent that an increase in termination rates above competitive levels would be unprofitable.
- 5.16 Even if fully passed through to retail prices, a 10% increase in the termination rate would not manifest itself as a 10% increase in retail price. If a SSNIP in the wholesale charge is small relative to retail prices it may not have an impact on customers' perception of retail prices or their behaviour. In that case, it would be unlikely that alternative methods for contacting a recipient would be sufficiently close substitutes to make a SSNIP unprofitable.

Demand-side substitution at the wholesale level

- 5.17 As wholesale demand for call termination is derived from retail demand, once the originating provider's retail subscriber has chosen to call a particular number, the originating provider has little alternative to purchasing termination from the provider controlling that number. Although in theory OTT VoIP bypass could be used, we consider this would be highly unlikely in practice in response to a SSNIP in call termination.¹²⁵

¹²⁵ OTT VoIP bypass is a mechanism whereby calls which are initiated as voice calls to a fixed number are diverted to terminate by an OTT VoIP provider on mobile or internet apps, without the knowledge of the calling party. This requires the originating provider, or transit provider, to enter a commercial agreement with the OTT provider and the calling party needs to have the relevant app installed. We do not have any information to suggest that OTT bypass currently occurs within the UK to a material extent or is likely to within the review period. Further, given that substitution is not

Supply-side substitution at the wholesale level

- 5.18 Supply-side substitution could occur if competitors were able to offer call termination to the particular number called. However, such competition could occur only if the provider that controlled the number were to grant entry to another provider to terminate calls on its number range. A provider is unlikely to have an incentive to give up its monopoly on call termination and we are not aware that this happens in practice. Therefore, we do not consider that there is a realistic prospect of supply-side substitution that would make a SSNIP unprofitable.

Aggregating the product market

- 5.19 If the analysis points to a separate product market being defined for termination to each individual number, it may be reasonable to widen the product market by aggregating individual product markets, if the individual markets face homogeneous competitive conditions.
- 5.20 We consider that fixed termination markets and mobile termination markets, respectively, would satisfy this criterion. As described above there is no demand- or supply-side substitution between individual telephone numbers, and the number holder is the only viable supplier of call termination. Recipients of calls to fixed geographic numbers and to mobile numbers do not bear the cost of the call and lack the ability to influence termination rates. There is little variation in the costs of providing call termination between different fixed geographic numbers. Similarly, there is little variation in the cost of providing call termination between mobile numbers. Consequently, all holders of geographic numbers and holders of mobile numbers respectively face homogenous competitive conditions across the numbers they hold.
- 5.21 There are some variations in competitive conditions between mobile call termination and WCT. The cost of providing mobile call termination is materially higher than the cost of terminating a fixed call.¹²⁶ Accordingly, we look at MCT and WCT separately, notwithstanding the strong similarities between them.

Geographic market definition

- 5.22 We consider that the geographic extent of each market is the area served by that provider. The competitive conditions a provider faces in providing termination services are not affected by the number of other telecoms providers in a particular geographic area since, as set out above, voice termination provided by one provider is not a substitute for termination provided by another.

straightforward, we do not consider that it would become materially more prevalent in response to a SSNIP in call termination, the value of which would be tiny, as discussed below.

¹²⁶ As discussed in Section 6, the cost of terminating a mobile call is approximately 0.5ppm, whereas the cost of terminating a fixed call is approximately 0.03ppm.

WCT market definition

*Geographic numbers*¹²⁷

5.23 This section takes as our starting point voice calls to phone numbers that are at a fixed location, that is, to numbers beginning 01 or 02. In Section 6 we explain that the cost of terminating a fixed call is approximately 0.03 ppm. Therefore, a SSNIP would equate to a price increase of up to 0.003 ppm, which would be highly unlikely to materially affect the choices made by either retail or wholesale customers. Accordingly, there are no sufficiently close substitutes at the retail level or wholesale level to broaden the market beyond the focal product of calls to a fixed geographic number.

Ported numbers

5.24 Where numbers have been ported, we have decided to include termination services provided by both donor providers and recipient providers. Calls to ported numbers are usually first routed to the provider that originally held the number (the donor provider) before being routed to the provider to which the number has been ported (the recipient provider), as the originating provider does not know the number has been ported. As a result, while WCT to these numbers is ultimately provided by the recipient provider, the originating provider has no option but to purchase WCT from the donor provider. We therefore consider that the donor provider as well as the recipient provider should be considered as providing a termination service.

Conclusion on WCT market definition

5.25 Given our analysis and the reasons described above, we conclude that the relevant markets are:

“wholesale call termination services that are provided by [named fixed communications provider](FCP) to another communications provider, for the termination of voice calls to United Kingdom geographic numbers in the area served by that FCP.”

Three criteria test for WCT

5.26 We are satisfied that the WCT markets we have identified for the purpose of making market powers determinations meet the three criteria in subsection 79(2B) of the Act. In making our assessment, we have had regard to the 2014 EC Recommendation which identifies wholesale call termination markets as ones which may have the characteristics which justify *ex ante* regulation, on the grounds they meet the three criteria test.

¹²⁷ We do not extend the product market definition to include WCT to non-geographic numbers. This is because competitive conditions are different for termination of non-geographic numbers than for termination of calls to fixed geographic numbers. We are proposing a review of the pricing of access charges for non-geographic calls alongside our ongoing Future of Numbering Policy Review. Ofcom, 2020. [Ofcom's proposed Plan of Work 2020/21](#), page 34. [Accessed 19 March 2021]

High and non-transitory barriers to entry

- 5.27 For the reasons set out above, the originating provider has little choice but to purchase call termination once its retail subscriber chooses to call a geographic number. There is no realistic prospect of demand- or supply-side substitution for call termination in these circumstances. Entry could occur only if the provider that controlled the number were to grant access to another provider to terminate calls on their number range. Accordingly, we are satisfied that there are high and non-transitory barriers to entry in these markets.

Market structure that does not tend towards effective competition in the relevant time horizon

- 5.28 Because of the absence of substitutes, the provider holding the geographic number called has a monopoly. Accordingly, we are satisfied that as a result of the structure of the WCT markets, there is no scope for effective competition for the duration of the review period.

The insufficiency of competition law alone to adequately address the market failure(s) concerned

- 5.29 Because of their monopoly position, providers of call termination have the ability and incentive to charge excessive prices or otherwise to provide access on unfair and unreasonable terms. Competition law alone does not provide a means of addressing these harms in a sufficiently timely and effective manner and would not give telecoms providers sufficient certainty over the course of the review period about the rates that they will pay for termination of calls to fixed geographic numbers.

Conclusion to WCT market analysis

- 5.30 For the reasons set out above, our forward-looking assessment in relation to the supply of WCT finds that the relevant market meets the three criteria in subsection 79(2B) of the Act and therefore, in accordance with subsection 79(2A) of the Act, it is susceptible to a market power determination and new *ex ante* SMP regulation in the supply of WCT.

MCT market definition

- 5.31 The starting point for our analysis in this section is voice calls to a UK mobile number. In Section 6 we explain that the cost of terminating a mobile call is less than 0.5 ppm. Therefore, a SSNIP would equate to a price increase of no more than 0.05 ppm, which would be highly unlikely to materially affect the choices made by either retail or wholesale customers. We note BT's comment that international calls are priced higher than other calls¹²⁸; in which case we would also expect a SSNIP in the MTR to have only a small effect on retail prices, if any.
- 5.32 BT also said "where competition occurs in areas other than price, [...] recent literature advocates the use of a Small but Significant and Non-transitory Decrease in Quality test (the SSNDQ test)". BT considered it more likely that a SSNDQ test would lead to product market definition inclusive of OTT calls given the importance of non-price factors such as call quality in this market.¹²⁹

¹²⁸ BT response to the August 2020 Consultation, page 9.

¹²⁹ BT response to the August 2020 Consultation, page 10.

- 5.33 We do not agree that an SSNDQ test is an appropriate way to define the relevant market in this instance. The literature referred to by BT suggests that a SSNDQ test may be appropriate where quality is costly and is the key driver of consumer choice, or in multi-sided markets where “free” products and services are provided to attract customers to a platform, with the value of their paying attention to the platform being exploited in other ways without charging them a price. MCT is not a multi sided market and is not provided “free”; it is charged for directly on a per minute basis. Nor is MCT a market where quality plays a central role in attracting customers as is the case in some of the markets where SSNDQ tests are proposed.
- 5.34 Accordingly, there are no sufficiently close substitutes at the retail level or wholesale level to broaden the market beyond the focal product of calls to a specific UK mobile number.

Numbers and services falling within our proposed product market definition

- 5.35 For similar reasons as those discussed in paragraph 5.24 above, and in more detail in the 2018 MCT Market Review Statement, our market definition includes:
- International calls to the UK;
 - Calls to voicemail and national roaming;
 - Calls to call forwarding services;
 - Other calls to UK mobile numbers (e.g. test calls, calls to customer services)¹³⁰;
 - Calls to ported numbers; and
 - Calls to UK numbers allocated to MCT providers in the Channel Islands and the Isle of Man.

International and roaming calls

- 5.36 Our market definition includes calls to UK mobile numbers originated internationally. It includes calls to UK mobile numbers while roaming abroad but does not include calls to overseas numbers while international consumers are roaming in the UK. For calls to UK numbers while roaming abroad, the UK provider will first effectively terminate the call from the perspective of the originating or transiting provider, before forwarding to the relevant foreign network. For calls to overseas numbers roaming in the UK, these will first be effectively terminated by the overseas provider, before being forwarded to the UK visited network. These calls are subject to roaming agreements, and competitive conditions therefore differ in comparison to calls to UK mobile numbers.

Ported numbers

- 5.37 Where numbers have been ported, we propose to include termination services provided by both donor providers and recipient providers. Where calls are not directly routed, calls to ported numbers are first routed to the provider that originally held the number being called (the donor provider), before subsequently terminating on the recipient provider’s network. We therefore consider that, where calls are not directly routed, the donor provider as well as the recipient provider should be considered as providing a termination

¹³⁰ 2018 MCT Market Review Statement, paragraphs 3.77 to 3.80, 3.83 and 3.84.

service. This is a change from the markets defined in the 2018 MCT Market Review Statement, which only included calls to the donor provider, to bring it into line with our approach in WCT.

Providers in the Channel Islands and the Isle of Man

- 5.38 Calls to relevant UK numbers allocated to MCT providers in the Channel Islands and the Isle of Man would, to the extent they provide MCT services to those numbers in the UK (i.e. at a handover point on their network in the UK), fall within our proposed market definition.

Conclusion on MCT market definition

- 5.39 Given our analysis and the reasons described above, we conclude that the relevant markets are:

“termination services that are provided by [named mobile communications provider](MCP) to another communications provider, for the termination of voice calls to UK mobile numbers in the area served by that MCP.”

Three criteria test for MCT

- 5.40 We are satisfied that the MCT markets we have identified for the purpose of making market powers determinations meet the three criteria in subsection 79(2B) of the Act. In making our assessment, we have had regard to the 2014 EC Recommendation which identifies wholesale call termination markets as ones which may have the characteristics which justify *ex ante* regulation, on the grounds that they meet the three criteria test.

High and non-transitory barriers to entry

- 5.41 For the reasons set out above, the originating provider has little choice but to purchase call termination once its retail subscriber chooses to call a mobile number. There is no realistic prospect of demand- or supply-side substitution for call termination in these circumstances. Entry could occur only if the provider that controlled the number were to grant access to another provider to terminate calls on their number range. Accordingly, we are satisfied that there are high and non-transitory barriers to entry in these markets.

Market structure that does not tend towards effective competition in the relevant time horizon

- 5.42 Because of the absence of substitutes for call termination, the provider holding the mobile number called has a monopoly. Accordingly, we are satisfied that as a result of the structure of the MCT markets, there is no scope for effective competition for the duration of the review period.

The insufficiency of competition law alone to adequately address the market failure(s) concerned

- 5.43 Because of their monopoly position, providers of call termination have the ability and incentive to charge excessive prices or otherwise to provide access on unfair and unreasonable terms. Competition law alone does not provide a means of addressing these harms in a sufficiently timely and effective manner and would not give telecoms providers sufficient certainty over the rates that they will pay for termination of calls to mobile numbers.

Conclusion to market analysis for MCT

- 5.44 For the reasons set out above, our forward-looking assessment in relation to the supply of MCT finds that the relevant market meets the three criteria in subsection 79(2B) of the Act and therefore, in accordance with subsection 79(2A) of the Act, it is susceptible to a market power determination and new *ex ante* SMP regulation in the supply of MCT.

Market power assessment

Our proposals

- 5.45 In our August 2020 Consultation we proposed that each WCT provider has SMP in the market for call termination to geographic numbers it holds in the area served by that provider.
- 5.46 We also proposed that each MCT provider has SMP in the corresponding relevant market.

Stakeholder responses

- 5.47 Most respondents agreed with our SMP assessment for WCT (BT¹³¹, the FCS¹³², Magrathea¹³³, TalkTalk¹³⁴, Telecom2¹³⁵, and Vodafone¹³⁶). Simwood wanted Ofcom to update the WCT product market definition to include the concept of hosting (so that the hosting provider is considered to be subject to the SMP and by extension to GC B3).¹³⁷ While Vodafone agreed with our SMP assessment for WCT, it also said that “where the number range owning CP makes use of a hosting provider to terminate the traffic on their behalf, any regulatory obligations on making the regulated termination available should apply in a transparent way.”¹³⁸
- 5.48 Most respondents agreed with our SMP assessment for MCT (the FCS¹³⁹, Magrathea¹⁴⁰, TalkTalk¹⁴¹, Telecom2¹⁴², Telefonica¹⁴³ and Vodafone)¹⁴⁴. BT said that OTT calls offered by competing providers were an indirect competitive constraint on prices for the traditional wholesale MCT service and therefore mitigate – and potentially in the future eliminate – any SMP concerns.¹⁴⁵ BT also said that competition from OTT players in the retail mobile market may in the future justify relaxing SMP remedies imposed on providers of the

¹³¹ BT response to the August 2020 Consultation, page 10.

¹³² The FCS response to the August 2020 Consultation, page 3.

¹³³ Magrathea response to the August 2020 Consultation, page 2.

¹³⁴ TalkTalk response to the August 2020 Consultation, page 2, paragraph 3.4.

¹³⁵ Telecom2 response to the August 2020 Consultation, pages 2-3.

¹³⁶ Vodafone response to the August 2020 Consultation, page 28.

¹³⁷ Simwood response to the August 2020 Consultation, pages 6-8.

¹³⁸ Vodafone response to the August 2020 Consultation, page 28.

¹³⁹ The FCS response to the August 2020 Consultation, page 3.

¹⁴⁰ Magrathea response to the August 2020 Consultation, page 2.

¹⁴¹ TalkTalk response to the August 2020 Consultation, page 3, paragraph 4.3.

¹⁴² Telecom2 response to the August 2020 Consultation, page 3.

¹⁴³ Telefonica Response to the August 2020 Consultation, page 4, paragraph 2.1.

¹⁴⁴ Vodafone response to the August 2020 Consultation, page 28.

¹⁴⁵ BT Response to the August 2020 Consultation, pages 10-11.

wholesale MCT service, including the removal of the more intrusive SMP remedies such as cost based price controls.

Our reasoning and decisions

Approach to the assessment of market power

- 5.49 In the sections above, we defined separate markets for WCT and MCT.
- 5.50 In this section we assess whether providers that operate in those markets have SMP as defined in section 78 of the Act. In making our assessment, we have had regard to the EC SMP Guidelines. We assess by reference to the following criteria:
- high current and future market shares;
 - high barriers to entry;
 - an absence of effective countervailing buyer power; and
 - evidence of pricing above competitive levels.
- 5.51 As discussed above, there are shared features between WCT and MCT relevant to our assessment of SMP. We therefore assess how both meet these criteria below, before setting out our conclusions in relation to WCT and MCT separately.

Market shares

- 5.52 Given our proposed market definition for both WCT and MCT, it follows that each number range holder has 100% of the market for calls terminating to numbers that it controls.

Barriers to entry and expansion

- 5.53 Market entry could only occur if a terminating provider were to grant entry to another provider to terminate calls on its number range. As mentioned above, we think it is unlikely that a provider would allow entry in this way as it would introduce competition and reduce its profits. We consider that as a result, barriers to entry are high and will remain high throughout the review period in WCT and MCT.¹⁴⁶

Countervailing buyer power

- 5.54 Countervailing buyer power (CBP) could exist if purchasers of termination services (i.e. other telecoms providers) could constrain the price of termination by threatening to refuse to purchase termination, or by threatening to raise their own termination rates in response to termination rate above the competitive level. However, the ability and incentive for telecoms providers to constrain prices using CBP is limited. Threatening to stop purchasing termination in response to a price increase, is unlikely to be credible as telecoms providers have a commercial incentive to offer their customers the ability to call all numbers. While in theory a telecoms provider with a high share of WCT or MCT volumes could threaten to

¹⁴⁶ We describe our view that OTT VoIP bypass is unlikely to be a sufficient constraint in the market definition section above.

increase their own termination rates, in response to a termination rate increase by the other party' this mechanism did not prevent very high termination rates in the past. Even if larger MCT providers were able to secure a low rate for themselves this would not protect other providers. Fixed providers are unable to threaten to raise their termination rates for geographic numbers because of the WCT charge control.

Pricing behaviour

- 5.55 The submissions we received from providers of both WCT and MCT as part of their obligation to notify Ofcom of their termination rates suggested their termination charges in the previous financial year were at the level of the cap that we set in our charge control. This is consistent with a finding of SMP.

Conclusion on market power in WCT

- 5.56 We do not agree with Simwood that the hosting provider holds SMP, where the number range holder contracts with a hosting provider. Although the number range holder may choose to purchase some or all of the network elements required to physically terminate the call from a hosting provider and this may extend to the hosting provider concluding termination agreements, the number range holder retains ultimate control over the number range. The purchase of hosting services is a commercial decision for the range holder, as is the choice of hosting provider. The intervention of a hosting provider can only occur with the authorisation of the number range holder and consequently wholesale call termination cannot occur without, directly or indirectly, the agreement of the number range holder.
- 5.57 Similarly, where a number range holder sub-allocates its numbers to another provider, wholesale call termination cannot occur without, directly or indirectly, the involvement of the original number range holder.
- 5.58 Our assessment that each number range holder has 100% share of the market for numbers that it controls enables a presumption of SMP in each relevant market. In addition, our assessments under the other criteria above are also consistent with a finding of SMP. We therefore conclude that each provider has SMP in the market for call termination to geographic numbers in the area served by that provider.¹⁴⁷ These providers are listed in the relevant legal instrument at Annex 5.

Conclusion on market power in MCT

- 5.59 We reviewed the constraint provided by OTT call services as part of our market definition exercise above. Based on that assessment we do not agree with BT that competition from OTT services means that there is no SMP in the provision of MCT. We note BT's comments about the potential for the constraint from OTT services to increase in the future, however we do not foresee a material change in circumstances during the review period.

¹⁴⁷ We also discuss hosting arrangements in Section 7.

- 5.60 Our assessment that each mobile operator has 100% of the market share for numbers that it controls enables a presumption of SMP in each relevant market. In addition, our assessments under the other criteria above are also consistent with a finding of SMP. We therefore conclude that each MCT provider has SMP in the corresponding relevant market. These providers are listed in the relevant legal instrument at Annex 5.

6. WCT and MCT market remedies

- 6.1 In this section, we set out the remedies that we are putting in place to address the competition concerns that could arise from providers having SMP in the provision of WCT and MCT. We look first at the appropriate regulation of WCT, and then the appropriate regulation of MCT, for UK calls that terminate within the UK. We then address the regulation of MCT and WCT for international calls that terminate within the UK.
- 6.2 The remedies we are putting in place to address the competition concerns in WCT markets are:
- A network access obligation on all WCT providers;
 - A charge control on all WCT providers (without a price notification obligation) for UK calls that terminate in the UK on UK geographic numbers;
 - For BT specifically, a requirement not to unduly discriminate, a requirement to publish a Reference Offer and financial reporting obligations; and
 - For calls to UK geographic numbers originating outside the UK, a requirement that the termination rate is no more than the reciprocal geographic termination rate charged by the relevant international telecoms provider for a call originating from the UK provider, or the UK domestic WCT rate, whichever is higher.
- 6.3 Our remedies in relation to WCT are the same as the conditions that currently apply to providers of these services, except we will no longer include a price notification obligation on any WCT providers. We have set the level of the charge control for WCT at the same level as was applied in 2020, but have adjusted it in line with inflation.
- 6.4 The remedies we are putting in place to address the competition concerns in MCT markets are:
- A network access obligation on all MCT providers;
 - A charge control on all MCT providers (without a price notification obligation) for UK calls terminating in the UK; and
 - For calls to UK mobile numbers originating outside the UK, a requirement that the termination rate is no more than the reciprocal mobile termination rate charged by the relevant international telecoms provider for a call originating from the UK provider, or the UK domestic MCT rate, whichever is higher.
- 6.5 Our remedies in relation to MCT are the same as the conditions that currently apply to providers of these services, except we will no longer include a price notification obligation. We have set the level of the charge control for MCT to reflect the Long Run Incremental Cost (LRIC) of providing mobile termination services using our 2021 cost model.
- 6.6 We have changed the price regulation for the termination of international calls. For the review period UK providers will be subject to a reciprocity condition. The aim of this measure is to encourage providers in the UK and elsewhere to set low termination rates, which we think are in the best interests of UK consumers.

WCT remedies

6.7 In the following paragraphs we set out, in relation to each of our WCT remedies, our August 2020 proposals and the responses we have received. We then explain our reasoning and decisions, having taken into account consultation responses.

WCT network access obligation – all WCT providers

Our proposals

6.8 In our August 2020 Consultation we proposed to retain an SMP condition that requires all WCT providers to provide network access on reasonable request on fair and reasonable terms, conditions and charges (save where a charge control applies).¹⁴⁸

Stakeholder responses

6.9 We received responses from seven stakeholders (BT¹⁴⁹, FCS¹⁵⁰, Magrathea¹⁵¹, TalkTalk¹⁵², Telecom2¹⁵³, UKCTA¹⁵⁴ and Vodafone¹⁵⁵), all of whom agreed with the network access obligation in relation to WCT. We address BT's response in respect of the application of the condition to its interconnection services in Section 7 of this statement.

Our reasoning and decisions

6.10 In the absence of a requirement to provide network access on fair and reasonable terms and conditions, providers with SMP in WCT could have the ability and incentive to refuse access to their network or make access subject to unfair or unreasonable terms. This could place the originating provider at a competitive disadvantage and could distort retail competition.

6.11 A network access obligation ensures telecoms providers can offer their customers end-to-end calls to all geographic numbers in the UK, which is in the interests of consumers and promotes competition in the provision of retail offers.

6.12 We have therefore decided to set an SMP condition on providers of WCT, requiring them to provide network access on fair and reasonable terms and conditions (save where a charge control applies).

¹⁴⁸ This obligation applies to network access and to any associated facilities (such as interconnection) which are required in order to access WCT.

¹⁴⁹ [BT](#) response to the August 2020 Consultation, page 12.

¹⁵⁰ [FCS](#) response to the August 2020 Consultation, page 3.

¹⁵¹ [Magrathea](#) response to the August 2020 Consultation, page 2.

¹⁵² [TalkTalk](#) response to the August 2020 Consultation, paragraph 3.5.

¹⁵³ [Telecom2](#) response to the August 2020 Consultation, page 3.

¹⁵⁴ [UKCTA](#) response to the August 2020 Consultation, page 6.

¹⁵⁵ [Vodafone](#) response to the August 2020 Consultation, page 28.

WCT charge control obligation – all WCT providers

Our proposal

- 6.13 In our August 2020 Consultation, we proposed to set a charge control on the WCT rates for fixed calls. We proposed to base the WCT price cap on our 2017 estimate of LRIC¹⁵⁶, adjusted for inflation, using the formula set out in our August 2020 Consultation.¹⁵⁷ In practice this means that the charge control will remain at a constant level in real terms over the review period.
- 6.14 In the 2017 NMR Statement we introduced an obligation for all telecoms providers who have SMP in WCT to notify Ofcom annually of the fixed termination rate (FTR) charged in the previous charge control year. The remedy was designed to allow us to monitor compliance effectively and enforce against telecoms providers that did not comply with the charge control. In our August 2020 Consultation we proposed to remove this notification requirement for WCT on the grounds of proportionality.

Stakeholder responses

- 6.15 We received seven responses on our proposed charge control, six of whom agreed with our proposal (BT¹⁵⁸, FCS¹⁵⁹, Magrathea¹⁶⁰, TalkTalk¹⁶¹, Virgin Media¹⁶² and Vodafone¹⁶³). Magrathea was concerned that telecoms providers that had not built out to BT's Digital Local Exchanges (DLEs) where BT currently offers WCT would be charged more than the regulated FTR to terminate their calls.¹⁶⁴
- 6.16 Telecom2 argued that Ofcom failed in its approach to capping termination rates, as retail charges for out of bundle calls remain high and can cause consumer harm and bill shock.¹⁶⁵

Our reasoning and decisions

- 6.17 For the reasons set out below, and having taken into account stakeholder responses, we have decided to set a charge control on the termination rates of fixed calls. We have maintained the price cap at its current level in real terms.

Reason for a charge control and relevant cost standard

- 6.18 In the absence of a charge control, telecoms providers with SMP in WCT could set charges for WCT at an excessively high level. This would not only increase the margin of the WCT provider, but also alter the incentives of its rivals on the retail side of the market (by

¹⁵⁶ Our 2017 model estimated LRIC of 0.0269ppm for the 2020/21 period in 2016/17 prices.

¹⁵⁷ We proposed that the new FTR cap would take effect from 1 June 2021, after a 2-month implementation period, during which we propose that FTRs remain at their 2020/2021 level.

¹⁵⁸ BT response to the August 2020 Consultation, page 12.

¹⁵⁹ FCS response to the August 2020 Consultation, page 3.

¹⁶⁰ Magrathea response to the August 2020 Consultation, page 3.

¹⁶¹ TalkTalk response to the August 2020 Consultation, page 2.

¹⁶² [Virgin Media](#) response to the August 2020 Consultation, page 2.

¹⁶³ Vodafone response to the August 2020 Consultation, page 29.

¹⁶⁴ Magrathea response to the August 2020 Consultation, page 3.

¹⁶⁵ Telecom2 response to the August 2020 Consultation, page 4.

reducing their margins and/or leading them to increase retail prices), all of which could distort competition in retail markets and harm consumers.

- 6.19 Given the persistent nature of SMP in WCT markets, and the distortions which would be caused by high FTRs, a charge control on termination rates is necessary to promote competition in the retail markets. A charge control allows us to intervene in a consistent and timely manner to prevent high prices and provides legal and regulatory certainty for providers that need WCT.¹⁶⁶
- 6.20 Our view is that a cost-orientated charge control remains the most effective way to minimise the risk of distortions that could be caused by excessive FTRs, and that the LRIC standard remains the appropriate cost standard. Our reasons for this include the following:¹⁶⁷
- **FTRs at LRIC facilitate more effective competition.** The FTR is an incremental cost for calls that terminate on another network (off-net calls) and so FTRs are likely to influence the price of such calls. This is particularly the case for smaller telecoms providers for whom off-net calls are likely to be a larger proportion of all calls. FTRs above LRIC can therefore put pressure on retail prices, particularly for smaller providers. They may also increase the costs for smaller telecoms providers of competing for customer segments that make more calls than they receive.
 - **Allocative efficiency considerations do not necessarily point to an optimal FTR which is above LRIC.** While it could in theory be allocatively efficient for FTRs to contribute to common as well as incremental costs through a mark-up above LRIC, in practice the optimal level of any mark-up over LRIC is highly uncertain. This is, for example, because FTRs are two-way charges and the opportunity to recover common costs on the retail side of the market reduces the optimal mark-up.
 - **In terms of choosing LRIC over LRIC+, effective retail competition should give WCT providers an incentive to minimise costs** under either a LRIC or LRIC+ cost standard and so productive efficiency considerations provide little to choose between them.
- 6.21 We are of the view that all providers of WCT with SMP should be subject to the same charge control, as symmetric FTRs best address competition concerns. For example, if some telecoms providers were able to set higher FTRs while rivals were only able to set prices at LRIC, this could provide the telecoms provider with high FTRs with a distortionary competitive advantage. Depending on the level of the FTR, the additional revenues could allow it to discount its retail offers in a way not related to greater efficiency or the provision of a service better meeting the needs of consumers.

¹⁶⁶ Whilst excessive prices charged by a dominant provider are potentially an infringement of the Competition Act, we do not consider that ex post intervention would be timely nor would it provide legal and regulatory certainty.

¹⁶⁷ Long Run Incremental Cost (LRIC), the cost standard currently used to set WCT and MCT termination rates, measures the incremental cost to a telecoms provider of providing a service in the long run. It includes the variable and fixed costs associated with the service increment in question. LRIC+ includes these costs as well as a mark-up for joint and common costs.

Specification of the charge control

- 6.22 We last reviewed the costs of providing wholesale fixed call termination in 2017 (the 2017 WCT model). The level of the FTR price cap is set at 0.0292ppm for the period from 1 April 2020 to 31 March 2021. This price level derives from our estimate of the LRIC of providing WCT adjusted for inflation between 2016/17 and 2020/21.¹⁶⁸
- 6.23 Given the very low level of the FTR cap, even changes to the current FTR that are proportionally quite large are still very small in absolute terms. WCT charges in aggregate make up a very small proportion of overall industry revenues. For example, BT's 2019 Regulatory Financial Statement recorded external revenues from WCT charges of £5m for the year ended 31 March 2020.¹⁶⁹ To put WCT revenues in perspective, this represents less than 0.2% of BT's fixed voice revenues across the same period.¹⁷⁰
- 6.24 In that context, provided that WCT charges remain low and continue to reflect the LRIC of providing call termination to fixed numbers overall, small variations on the level of the charge are unlikely to have a significant impact on the risks described above.
- 6.25 Therefore, we consider that a charge control for the review period, based on the 2017 WCT cost model, will be sufficient to resolve our competition concerns and that it is not necessary to undertake a new cost modelling exercise.¹⁷¹
- 6.26 With regards to Magrathea's concern in relation to charges for telecoms providers that had not built out to a DLE, providers can choose to build their own network to the relevant Point of Connection (POC), which in the case of BT's TDM network is the DLE, or they can choose to purchase additional conveyance services from BT (or another provider) to convey calls between their own network and the POC. This is a commercial decision for that provider and any charges for conveyance or transit of calls are a matter for commercial negotiation between telecoms providers.
- 6.27 In response to Telecom2, the purpose of the WCT charge control is to prevent providers from setting excessive wholesale charges for the termination of calls to geographic numbers in the UK. In our view a charge control is an effective remedy to achieve that end. We note that many end users buy calls as part of a bundle and any assessment of retail prices should consider both in bundle and out of bundle calls.¹⁷² In any event retail regulation is not within the scope of this review.¹⁷³

¹⁶⁸ Costs were estimated in 2016/17 prices using our 2017 WCT cost model. The level of the price cap in nominal terms was determined by uprating these estimated using the Consumer Price Index as set out in conditions 5C.4 and 5C.8 from our 2017 NMR Statement.

¹⁶⁹ BT, 2020. [Regulatory Financial Statement](#) page 25. [Accessed 23 March 2021]

¹⁷⁰ BT had retail fixed access and call revenues of £3.1 billion for the year ended 31 March 2020, see Table 1 of Ofcom's [Telecommunications Market Data update Q1 2020](#). [Accessed 23 March 2021]

¹⁷¹ In order to allow time for providers of WCT to adjust their prices we have set the charge control at its current level (0.0292ppm) for the first two months of the review period. The level of the charge control then increases in line with the CPI for the remaining five periods of the review period. This is set out under condition 3A in Annex 5.

¹⁷² We have also found that the majority of calls are 'in bundle' and the consumer is therefore not charged separately for these calls. Ofcom, 2020. [Pricing trends for communications services in the UK](#), pages 40 – 43. [Accessed 23 March 2021].

¹⁷³ We have reviewed standalone voice-only services in 2017 and have recently decided to accept BT's commitments in relation to those services. Ofcom, 2021. [Protecting voice-only landline telephone customers](#) [Accessed 23 March 2021]

- 6.28 We proposed to remove the notification requirement for WCT charges on the grounds of proportionality. Since we introduced the requirement, we have not significantly relied on this information for the purpose of enforcement action. In view of this, and in line with our aim to make regulations less burdensome, we have decided to remove this requirement.
- 6.29 If we have reason to suspect non-compliance with the cap, we can use our formal information gathering powers to request the relevant termination rate information from telecoms providers.

Additional non-pricing remedies for WCT – BT only

Our proposals

- 6.30 BT is currently subject to a number of non-price SMP conditions for WCT that do not apply to other telecoms providers. These have been applied to BT because of BT's scale and importance in the provision of WCT.
- 6.31 In our August 2020 Consultation, we proposed to maintain the following conditions:
- a requirement not to unduly discriminate;
 - a requirement to publish a Reference Offer; and
 - reporting obligations.

Stakeholder responses

- 6.32 We received six responses to our proposal to impose non-price remedies on BT, with most respondents agreeing with our proposals. BT was the only stakeholder to disagree with our proposals.¹⁷⁴
- 6.33 Telecom2¹⁷⁵, Magrathea¹⁷⁶, Vodafone¹⁷⁷, FCS¹⁷⁸ and TalkTalk¹⁷⁹ specifically agreed with our proposal for a no undue discrimination requirement. In particular, Vodafone said that it remains vital that BT is unable to discriminate given its scale and market position (as both a significant originator, terminator, transit provider, hosting partner, supplier of number portability conveyance and a range of special services that necessitate the need for BT interconnection).¹⁸⁰ In addition, Telecom2 and Vodafone also specifically agreed with our proposal to require a Reference Offer. Finally, Vodafone also supported the financial reporting requirements.
- 6.34 BT disagreed with our proposal to impose a no undue discrimination obligation on BT only.¹⁸¹ BT's comments on no undue discrimination related to both WCT and

¹⁷⁴ BT response to the August 2020 Consultation, page 19.

¹⁷⁵ Telecom2 response to the August 2020 Consultation, page 3.

¹⁷⁶ Magrathea response to the August 2020 Consultation, page 2.

¹⁷⁷ Vodafone response to the August 2020 Consultation, page 28.

¹⁷⁸ FCS response to the August 2020 Consultation, page 3.

¹⁷⁹ TalkTalk response to the August 2020 Consultation, paragraph 3.7.

¹⁸⁰ Vodafone response to the August 2020 Consultation, page 28.

¹⁸¹ BT response to the August 2020 Consultation, page 19.

interconnection; we therefore address BT's comments relating to no undue discrimination in Section 7 below.

Our reasoning and decisions

- 6.35 We have decided to impose additional remedies on BT. We consider this is appropriate because of BT's scale and importance in the provision of WCT. BT is the largest provider of WCT and accounts for a large share of WCT in the UK.¹⁸² This reflects BT's role as a holder of number ranges for a large proportion of end users and as a donor provider for numbers that have been ported to other providers.
- 6.36 Our competition concern in respect of BT's SMP is that BT could set prices or other terms for WCT that discriminate between telecoms providers in a way that harms competition (for example by imposing terms of supply that disadvantage certain providers). BT's high share of WCT volumes and its importance as a partner for other fixed providers means that the impact of discriminatory conduct by BT would have a greater effect on the availability of WCT and on downstream competition than similar conduct undertaken by other geographic number range holders.
- 6.37 We note that BT will withdraw all its WLR services by the end of the review period. This may cause some numbers currently held by BT to be transferred to other providers' networks, which would diminish its share of WCT volumes.¹⁸³ It may be that in future BT's market position will change as a consequence, but we expect BT's share of WCT to remain high throughout the review period, as we expect it will remain a large supplier of fixed telecoms services to end users and a donor provider for other retailers.
- 6.38 Having taken account of the stakeholder comments we received, we remain concerned that BT's size in terms of subscribers, fixed call termination volumes and as a number range holder could give it the ability and incentive to set terms for WCT that discriminate between telecoms providers in a way that harms competition (for example by imposing terms of supply that disadvantage certain providers).
- 6.39 We do not consider *ex post* competition law would be sufficient in these circumstances to address the additional competition concerns arising from BT's SMP. We have therefore decided to impose the measures set out below in order to prevent and monitor the conduct with which are concerned.

Requirement not to unduly discriminate

¹⁸² We collected WCT volumes from BT and six other large providers of telecommunications services (Sky, Telefónica, Three, TalkTalk, Virgin Media and Vodafone). BT provided [X] minutes of WCT in 2019/20. The next largest supplier was [X] with [X] minutes followed by [X] with [X] minutes. BT accounted for approximately [X]% of minutes terminating on fixed geographic numbers in 2019/20 (Ofcom estimate based on geographic call termination volumes from BT and six other providers. Although we did not collect data from all providers, we found it likely that our data captured the majority of WCT volumes (based on Ofcom Market Intelligence data showing that [X] of exchange lines in the UK are accounted for by BT, Sky, Virgin Media, Vodafone and TalkTalk. If the number of calls terminated per exchange line is constant this would imply that BT's overall share of WCT volumes was around [X] in 2019/20).

¹⁸³ If numbers are ported to other providers, the new provider will terminate the call. However, BT will remain involved in the termination of the call as it will be the donor provider for that call. This means that BT's share of termination volumes will not reduce as much as would be the case in a system where calls are directly routed between providers.

- 6.40 Where dominant providers are vertically integrated, like BT, they may have an incentive to provide WCT on terms and conditions that disadvantage downstream rivals or to discriminate selectively between competing providers. In addition, as noted above, BT's scale in the provision of WCT means the effect of such conduct on downstream competition would be felt more widely than if exercised by another terminating provider.
- 6.41 Of the six stakeholders that commented on this in their response, five (FCS¹⁸⁴, Magrathea¹⁸⁵, TalkTalk¹⁸⁶, Telecom2¹⁸⁷ and Vodafone¹⁸⁸) agreed that Ofcom should maintain a no undue discrimination obligation on BT. One provider, BT, disagreed with our proposal.¹⁸⁹
- 6.42 Having taken account of consultation responses, we remain of the view that BT, a vertically integrated provider, could have an incentive to provide WCT on terms and conditions that disadvantage downstream rivals or to discriminate selectively between competing providers.
- 6.43 We consider that the scope for such discriminatory conduct is likely to be mitigated to some extent by the package of other remedies we are imposing for WCT. For example, unduly discriminatory terms and conditions may be inconsistent with the obligation to provide network access on fair and reasonable terms and conditions. Moreover, given the charge control on termination rates which we are setting, BT is limited in its ability to discriminate on price.
- 6.44 However, we consider that even with the package of other remedies we are imposing for WCT, there remains a risk that BT could unduly discriminate against certain providers. BT could discriminate in ways that are not captured easily under other regulations, for example, a requirement for some providers to adhere to technical standards that are not required of others. Given BT's scale in the provision of WCT this could have a significant impact on the availability of WCT. We therefore consider that a no undue discrimination obligation continues to be necessary to prevent such conduct from occurring.

Requirement to publish a Reference Offer

- 6.45 As set out above, both Vodafone and Telecom2 supported our proposal to impose a requirement on BT to publish a Reference Offer.¹⁹⁰ We did not receive any further comments on the Reference Offer.
- 6.46 We consider it appropriate to retain the condition on BT to publish a Reference Offer for its provision of WCT. The Reference Offer provides stakeholders and industry with transparency about the terms and conditions on which providers can purchase WCT from BT, to enable faster negotiations, to minimise the risk of disputes and to enable

¹⁸⁴ FCS response to the August 2020 Consultation, page 3.

¹⁸⁵ Magrathea response to the August 2020 Consultation, page 2.

¹⁸⁶ TalkTalk response to the August 2020 Consultation, paragraphs 3.7 – 3.8.

¹⁸⁷ Telecom2 response to the August 2020 Consultation, pages 3 – 4.

¹⁸⁸ Vodafone response to the August 2020 Consultation, page 28.

¹⁸⁹ BT response to the August 2020 Consultation, page 19.

¹⁹⁰ Vodafone response to the August 2020 Consultation, pages 29 – 30; Telecom2 response to the August 2020 Consultation, page 3.

comparison between terms and conditions of their supply contracts and those in the Reference Offer.

- 6.47 We consider it appropriate for the published Reference Offer to include:
- A clear description of the services on offer.
 - Terms and conditions including charges and ordering, provisioning, billing and dispute resolution procedures. The Reference Offer should provide sufficient information to enable providers to make technical and commercial judgements such that there is no material adverse effect on competition.
 - Conditions relating to maintenance and quality (service level agreements and guarantees). The inclusion of service levels, as part of the contractual terms of the Reference Offer, that provides for a minimum acceptable level of service, will ensure that services are provided in a fair, reasonable, timely and non-discriminatory fashion.
- 6.48 Where BT provides WCT to itself on terms that differ from the Reference Offer it must publish those terms and make them available to third parties. This is to enable providers to compare the terms under which BT supplies WCT to itself with those in the Reference Offer and their own supply contracts.

Reporting obligations

- 6.49 We are imposing regulatory reporting remedies in the form of accounting separation and cost accounting obligations. These are discussed in Section 8.

MCT remedies

MCT network access obligation

Our proposal

- 6.50 In our August 2020 Consultation, we proposed to retain an SMP condition that requires all MCT providers with SMP to provide network access on reasonable request on fair and reasonable terms and conditions.

Stakeholder responses

- 6.51 All respondents to this question agreed with our proposal.¹⁹¹

Our reasoning and decisions

- 6.52 In the absence of a requirement to provide network access on fair and reasonable terms, MCT providers with SMP would have an incentive and the ability to set high prices for call termination, or could limit access in other ways, such as setting unfair or unreasonable

¹⁹¹ BT response to the August 2020 Consultation, page 12; FCS response to the August 2020 Consultation, pages 3 – 4; Magrathea response to the August 2020 Consultation, page 3; TalkTalk response to the August 2020 Consultation, paragraph 4.4; Telecom2 response to the August 2020 Consultation, page 5; Telefónica response to the August 2020 Consultation, page 4; Vodafone response to the August 2020 Consultation, page 29.

terms or refusing access to their network. This could place the originating provider at a competitive disadvantage and could distort retail competition.

- 6.53 A network access obligation ensures telecoms providers can offer their customers end-to-end calls to all mobile numbers in the UK, and promotes competition in the provision of retail offers.
- 6.54 In order to address this competition concern, we have decided to maintain an access obligation on all MCT providers.

MCT charge control obligation

Our proposal

- 6.55 In our August 2020 Consultation we proposed a charge control on mobile termination rates. We proposed to use a bottom-up cost model (the 2020 MCT model) to calculate the LRIC of MCT.¹⁹² This model was an updated version of the previously-used MCT models, accounting for new historical traffic data and to update the WACC assumption in the model. The net effect of these changes was to lower the output MCT rate from its current level of 0.468ppm to a value between 0.257ppm and 0.485ppm for 2021/22.

Stakeholder responses

- 6.56 We received seven responses on our proposals: BT¹⁹³, FCS¹⁹⁴, Magrathea¹⁹⁵, TalkTalk¹⁹⁶, Telecom2¹⁹⁷, Telefónica¹⁹⁸ and Vodafone.¹⁹⁹
- 6.57 Broadly, stakeholders agreed with our proposals, though some stakeholders had comments or concerns with specific elements of our proposed approach. These comments include:
- **WACC:** Two respondents, BT²⁰⁰ and TalkTalk²⁰¹, commented on our calculation of WACC, with BT believing we had underestimated the appropriate level of WACC and TalkTalk believing we had overestimated it.
 - **Cost trends:** Telefónica suggested in its response that Ofcom supplement the data we hold on cost trends with some 'light-touch' information requests to stakeholders, to better assess the impact of updating these assumptions on the outputs of the model.²⁰²

¹⁹² August 2020 Consultation, paragraphs 6.48 – 6.61 and Annex 6.

¹⁹³ BT response to the August 2020 Consultation, pages 12 – 14.

¹⁹⁴ FCS response to the August 2020 Consultation, page 4.

¹⁹⁵ Magrathea response to the August 2020 Consultation, page 3.

¹⁹⁶ TalkTalk response to the August 2020 Consultation, pages 4 – 5.

¹⁹⁷ Telecom2 response to the August 2020 Consultation, page 5.

¹⁹⁸ [Telefónica](#) response to the August 2020 Consultation, page 5.

¹⁹⁹ Vodafone response to the August 2020 Consultation, page 29.

²⁰⁰ BT response to the August 2020 Consultation, page 12.

²⁰¹ TalkTalk response to the August 2020 Consultation, paragraphs 4.8-4.10.

²⁰² Telefónica response to the August 2020 Consultation, page 5.

Our reasoning and decisions

6.58 For the reasons set out below and having taken into account stakeholders' responses, we have decided to impose a charge control on mobile termination rates. We have decided that a charge control set at LRIC remains the appropriate cost standard, and to use a bottom-up cost model (the 2021 MCT model) to calculate the LRIC of mobile termination rates.

Reason for a charge control and relevant cost standard

6.59 As we discuss above in relation to WCT, in the absence of price regulation, telecoms providers with SMP in MCT would have the ability and incentive to charge excessively high mobile termination rates (MTRs). Although it is possible that excess profits from MTRs set above cost could be passed through to some extent to the mobile provider's customers, for example through lower retail call prices or investment (this is known as the 'waterbed effect'), high MTRs could nevertheless distort competition in retail markets and thereby harm customers.

6.60 Before MTRs were regulated, mobile providers set very high MTRs and this had a number of adverse effects on competition. For example, high termination rates distorted pricing incentives, leading to high prices for out-of-network calls. Subsequent regulation of MTRs has brought rates down with charges set at cost.

6.61 Given the persistent nature of SMP in MCT markets, and the distortions which would be caused by high MTRs, our view is that *ex ante* price regulation is necessary to promote competition in the retail markets. In this context, given that MCT is a key component of network access to secure end-to-end connectivity and noting that all telecoms providers which hold mobile numbers have SMP in MCT, it would not be sufficient to rely on *ex post* competition law. Price regulation allows us to intervene in a consistent and timely manner, and provides legal and regulatory certainty.

6.62 Our view is that a cost-orientated charge control remains the most effective way to minimise the risk of distortions that could be caused by excessive MTRs, and that LRIC remains the appropriate cost standard. This issue has been considered in detail in previous market reviews. For example, in the 2015 MCT Market Review Statement we considered in detail whether LRIC or LRIC+ was more appropriate.²⁰³ In 2018, we concluded that these arguments remained applicable and we remain of that view.²⁰⁴ As we explained in 2015, LRIC is the most appropriate cost standard because, amongst other things:

- **MTRs at LRIC facilitate more effective competition.** MTRs above LRIC would increase the cost of subscribers making calls to other networks and therefore reduce the incentive to compete on retail call prices. This would particularly be the case for smaller mobile providers as a larger proportion of their customers' total calls are to recipients on other networks.²⁰⁵ Higher MTRs would also put smaller providers at a

²⁰³ Ofcom, 2015. [MCT Market Review Statement](#), section 6. [Accessed 23 March 2021]

²⁰⁴ Ofcom, 2018. [MCT Market Review Statement](#), section 5. [Accessed 23 March 2021]

²⁰⁵ See, for example, paragraphs 6.101-6.113, *2015 MCT Market Review Statement*.

disadvantage when competing for customers that are net makers of calls, and at a competitive advantage when competing to customers that are net receivers of calls.^{206,207} In addition, evidence suggests that removing barriers to entry caused by high termination rates set at LRIC+ in the past contributed to the increased competition in the market.²⁰⁸

- **Allocative efficiency considerations do not necessarily point to an optimal MTR which is above LRIC.** MTRs above LRIC would distort mobile providers' perception of incremental costs of calls and serving particular customers. Although in theory it could be efficient for MTRs to also contribute to common costs through a mark-up above LRIC, recovering common costs through retail prices instead could reduce distortions and therefore tend to reduce the optimal mark-up. The presence of call externalities, which result if receivers also benefit from calls, could also point to a lower optimal MTR in order to encourage calls where the value to the caller is lower than the incremental cost.²⁰⁹
- **A LRIC cost standard would be unlikely to discourage efficient investment:** Although an MTR set at LRIC could reduce overall industry profits in comparison to a LRIC+ cost standard (by reducing revenues from fixed and international provider), there is no evidence that the previous reduction from LRIC+ to LRIC in 2011 was associated with lower investment.²¹⁰
- Economic efficiency considerations do not suggest the harm from modelling errors resulting in MTRs below LRIC would be significant, or more harmful than MTRs above LRIC. The plausible scale of any potential modelling errors that might lead to MTRs below LRIC would be unlikely to lead to any significant reduction in allocative efficiency, and the associated risk would be similar to the risk of modelling errors resulting in MTRs above LRIC. In addition, MTRs below LRIC would be unlikely to have a significant impact on the return on investment (therefore dynamic efficiency) as revenues could also be recovered from the retail side of the market, and the impact would be modest in the context of total industry revenues.²¹¹

6.63 We are of the view that all providers of MCT with SMP should be subject to the same price cap, as symmetric MTRs best address competition concerns. For example, if some mobile providers were able to set higher MTRs while rivals were only able to set lower MTRs, this could provide the provider with high MTRs with a distortionary competitive advantage. Depending on the level of the MTR, the revenues could allow some mobile providers a competitive advantage that is not related to greater efficiency or the provision of a service better meeting the needs of customers.

²⁰⁶ See, for example, paragraphs 6.114-6.127, *2015 MCT Market Review Statement*.

²⁰⁷ In our *2018 MCT Market Review Statement*, regarding the procompetitive benefits of LRIC, we recognised that retail competition had become increasingly focused on data offers. See, for example, paragraph 4.79 of the *2018 MCT Market Review Statement*. This continues to be the case however we remain of the view that voice calls remain important with most packages typically offering high volumes of inclusive calls, which is more commercially viable when MTRs are low.

²⁰⁸ For example, see paragraphs 6.134-6.151, *2015 MCT Market Review Statement*.

²⁰⁹ For example, see paragraphs 6.24-6.42, *2015 MCT Market Review Statement*.

²¹⁰ For example, see paragraphs 6.63-6.84, *2015 MCT Market Review Statement*.

²¹¹ For example, see paragraphs 6.46-6.53 and 6.85-6.90, *2015 MCT Market Review Statement*.

- 6.64 In previous market reviews we have also considered whether a ‘Bill and Keep’ regime, which would be equivalent to setting termination rates at zero, might be appropriate. In our 2018 MCT Market Review Statement, we concluded that this could be the case if there were strong externality benefits (e.g. call externalities or competition arguments), or the transaction costs outweighed the revenues from MTRs.²¹² We did not have evidence that this was the case in 2018, and do not have evidence that it is likely to be the case during this review period. If it becomes efficient for providers, they would be able to agree a Bill and Keep arrangement between themselves.²¹³
- 6.65 In summary, we remain of the view that MTRs above LRIC could be damaging to competition. There is no clear evidence that rates below LRIC would maximise economic efficiency, and stakeholders broadly agreed with our proposals. We have therefore decided that a charge control set at LRIC remains the appropriate cost standard.

Summary of the 2021 MCT model

- 6.66 In order to calculate the LRIC of MCT in the UK we have decided to use an updated version of our previous model. We are therefore using a bottom-up cost model (the 2021 MCT model) which is published alongside this statement and explained briefly in this section and in greater detail in Annex 2.
- 6.67 The 2021 MCT model is structured similarly to our previous bottom-up MCT models.²¹⁴ It first calculates the amount of traffic (both voice and data) to be carried, then builds a network capable of carrying this traffic using routing factors and cost driver assumptions. It calculates the cost of this network, and spreads this cost over time using an economic depreciation algorithm. Finally, it determines cost recovery across services based on the routing factors used to build the network. We consider MCT as a ‘final increment’ with no common costs (such as the common costs of a ‘coverage network’) being allocated to MCT.²¹⁵
- 6.68 When we consulted on our proposed charge control and the appropriate model for calculating the LRIC of MCT, the EU regulatory framework continued to apply during the transition period. We therefore considered whether the European Commission’s model (known as the ‘Eurorates’ model), which has been used to set a single maximum MTR

²¹² Ofcom, 2018. *MCT Market Review Statement*, paragraphs 4.72-4.73.

²¹³ In our 2019 First Consultation, we noted that our preliminary view was that the options of deregulation or mandated Bill and Keep are unlikely to be appropriate. There was limited support from stakeholders for there to be a mandated Bill and Keep regime. Ofcom, 2019. [Future of interconnection and call termination](#) [Accessed 23 March 2021]

²¹⁴ We have previously calculated the cost of MCT using a bottom-up cost model first developed for the 2011 MCT Market Review Statement, significantly updated for the 2015 MCT Market Review Statement and used again for the 2018 MCT Market Review Statement.

²¹⁵ Under this approach, the incremental costs associated with incoming voice traffic are derived by first calculating the model outputs (i.e. service demand, asset volumes and cashflows for each network element) with incoming voice traffic included and, second, with incoming voice traffic excluded. The incremental service demand, asset volumes and cashflows for each network element are then be used as inputs to the economic depreciation algorithm. The output of this algorithm is the LRIC of an incoming minute of voice traffic in pence per minute (ppm) terms.

across all EU Member States, would be appropriate to set a UK-specific charge control.²¹⁶ Its output LRIC MTR is lower than that of our own model.

6.69 However, as set out in our August 2020 Consultation, the Eurorates model has been built to set rates across all EU Member States, while our own model is UK-specific. We continue to believe that the Eurorates model is not as well-suited to setting a UK-specific charge control as our own model.

6.70 All stakeholders who responded to our consultation question on this matter agreed with our approach to use an updated version of our previous model. We continue to believe this provides the best estimate of LRIC of MCT in the UK that is available to us and have therefore decided to base our modelling of MCT rates for the review period on the 2021 MCT model. We describe this model in greater detail in the following section.

Updates included in the 2021 MCT model

6.71 The 2021 MCT model is an updated version of, and very similar to, the 2020 MCT model on which we consulted in our August 2020 Consultation. This model was in turn based on the 2018 MCT model, with updated traffic volumes and WACC assumption. We considered that these updates struck an appropriate balance between the accuracy required and the regulatory burden any more extensive update would place on our stakeholders. For this statement, and considering stakeholder responses to our August 2020 Consultation, we have made the following decisions in producing the 2021 MCT model:

- **WACC:** Two respondents, BT²¹⁷ and TalkTalk²¹⁸, commented on our calculation of WACC, with BT believing we had underestimated the appropriate level of WACC and TalkTalk believing we had overestimated. We have conducted a detailed analysis of the WACC in the recently-published WFTMR 2021 Statement, and we have used the outputs of that analysis in this review.²¹⁹ We have therefore updated the WACC assumption from a pre-tax real rate of 5.8% in the 2020 MCT model to 5.7% in the 2021 MCT model.
- **Traffic volumes:** The 2020 MCT model accounted for around five years of additional traffic data compared with the previously used model, as the 2018 MCT model had retained the traffic inputs and forecasts from the 2015 MCT model. This update was broadly cost-neutral on the output LRIC. Since then, we have three additional quarters of traffic data covering the first nine months of 2020. Due to changes in usage driven by Covid-19, call and data traffic per subscriber have increased noticeably from the previous trend. All else equal, these changes would be likely to decrease the unit costs of MCT. However, we do not believe that consumers' use of voice and data during 2020 provides a reasonable basis on which to forecast traffic to the end of the charge control period as there may be a drop in usage later in the review period as the pandemic

²¹⁶ European Commission, 2020. [Voice call termination rates in the EU \(Eurorates\)](#) [Accessed 23 March 2021]

²¹⁷ BT response to the August 2020 Consultation, page 12.

²¹⁸ TalkTalk response to the August 2020 Consultation, paragraphs 4.8-4.10.

²¹⁹ In the WFTMR 2021 Statement, we have estimated a WACC applicable to mobile activities of BT Group. As set out in Annex 2, this WACC is an appropriate benchmark for a UK MNO. In our analysis for the 2021 WFTMR, we have taken account of the responses from BT and TalkTalk.

recedes. Forecasting the scale and timing of this drop would involve even greater uncertainty than in other forecasting exercises. We have decided not to update the traffic assumptions from the 2020 MCT model, as we believe doing so would not materially improve the accuracy of the model outputs.

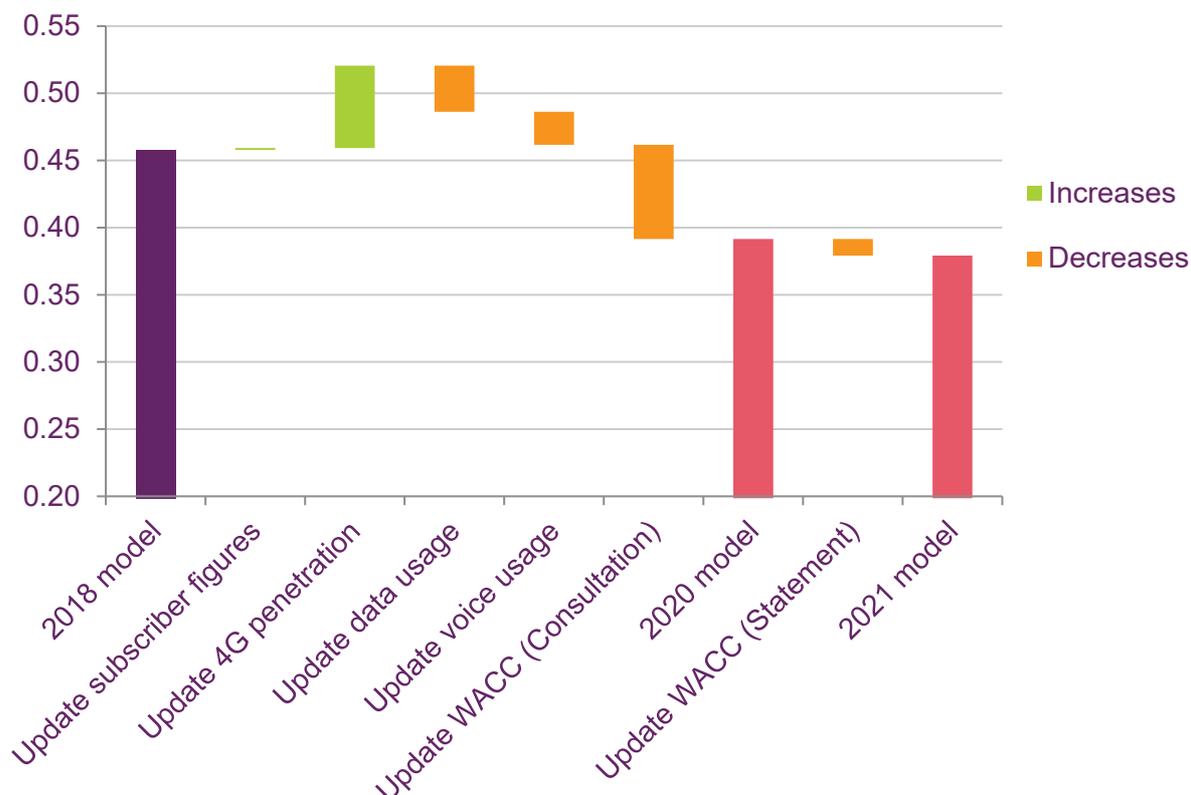
- **Cost trends:** Telefónica suggested in its response that we supplement the data we hold on cost trends with some ‘light-touch’ information requests to stakeholders, to better assess the impact of updating these assumptions on the outputs of the model.²²⁰ While we acknowledge that the accuracy of the model would be increased were we to update these cost trends, we do not believe that a ‘light-touch’ data request to stakeholders would allow us to update the cost trends without introducing inconsistency into the model. A more extensive data request and collection exercise would be required. This would, however, be likely to impose a significant burden on stakeholders given the necessary scope of such a request. Even if we were to conduct such an update, we do not believe it is likely to affect the outputs of the model enough to materially affect our regulatory aims. We note that other stakeholders supported our light-touch approach proposed in our August 2020 Consultation, and one other stakeholder (TalkTalk) specifically commented that a more detailed update to the model would be disproportionate.²²¹ We have decided not to undertake such an update for the 2021 MCT model.

6.72 Overall, the combined impact of the traffic volume updates and the updated WACC result in a 2021/22 MCT LRIC of 0.379ppm, as compared to 0.392ppm from the 2020 MCT model and 0.458ppm from the 2018 MCT model (updated to 2021/22 real prices). We show the breakdown of each of our updates to the 2018 MCT model, including our final 2020/21 WACC assumption, in the chart below.

²²⁰ Telefónica response to the August 2020 Consultation, page 5.

²²¹ TalkTalk response to the August 2020 Consultation, page 5, paragraph 4.11.

Figure 6.1: Impact of updating the 2018 MCT model, 2021/22 real ppm



Source: 2021 MCT model, Ofcom

6.73 The 2021 MCT model, like the 2020 MCT model it is based on, is broadly in line with stakeholder data and does not appear to systematically generate higher or lower values of asset counts and gross book value costs in its network. We consider that the 2021 MCT model provides a reasonable estimate of MCT over the forecast period having struck an appropriate balance between accuracy and regulatory burden.

Our approach to updating the MCT model

6.74 The updates we have made to improve the accuracy of the 2021 MCT model are shown above. We have not performed a comprehensive update to the model. In particular, the model does not account for 5G and Voice-over-WiFi (VoWiFi) technologies. We are still early into the deployment of 5G and it is not yet clear how much it may be used to carry voice or to change the balance of voice and data used on other technologies, so it is unclear whether the introduction of 5G would have a significant impact on our output MTR.

6.75 It is likely that a more detailed exercise that incorporates these elements would produce different results. However, given the historically low levels of MTRs at the present time²²², even changes to the current MTR that are proportionally quite large are still very small in

²²² MTRs have come down significantly over time, from around 8ppm in 2003 to around 4ppm in 2011, then to around 0.8ppm in 2014. The current regulated MTR is slightly under 0.5ppm.

absolute terms. In addition, MTRs represent less than 3% of mobile revenues and net revenues for MNOs from MTRs are low, around £65m in 2019.²²³

- 6.76 As such, provided that MTRs remain at low levels that reflect LRIC, it is unlikely that the additional accuracy provided by a more detailed modelling exercise would be significant in absolute terms. Such additional accuracy would not materially affect our regulatory aim of addressing the competitive distortions that can arise as a result of high MTRs. Therefore, in our view the modelling exercise we have undertaken is sufficiently accurate and a more detailed assessment is unnecessary.
- 6.77 Furthermore, as mentioned above, undertaking a more detailed modelling exercise would be a significant task involving a major data gathering exercise which would place a burden on Ofcom and our stakeholders. We have been particularly mindful to minimise regulatory burdens as far as possible during the ongoing disruption caused by Covid-19 so that stakeholders are able to focus resources on maintaining vital communications services and networks.
- 6.78 This approach is similar to what we proposed in our August 2020 Consultation. In their responses, stakeholders were supportive of this approach. While some stakeholders suggested small adjustments to our approach, no stakeholders argued that a more significant modelling exercise was preferable.
- 6.79 A case-by-case discussion of each of the main elements of the 2021 MCT model is included in Annex 2.

MCT rates over the charge control period

- 6.80 Based on the 2021 MCT model, the MTRs over the charge control period are:

Table 6.2: Current MTR, forecast MTR and values of X (real 2021/22 ppm)

	From 1 April 2020	From 1 June 2021	From 1 April 2022	From 1 April 2023	From 1 April 2024	From 1 April 2025
Current MTR	0.468					
Forecast MTR		0.379	0.371	0.379	0.387	0.393
X-value			-2.2%	+2.1%	+2.4%	+1.5%

Source: 2021 MCT model, Ofcom

- 6.81 The new MTR will take effect from 1 June 2021 after a two-month implementation period during which MTRs will remain at their present level.

²²³ Termination revenues are obtained by considering total and net termination volumes of 81.5 and 13.9 billion minutes, respectively and the 2018-19 MTR of 0.468 ppm. Total mobile revenues for 2019 are estimated to be £13.4 billion. Ofcom, 2021. [Telecoms data updates](#) [Accessed 23 March 2021]

Removal of MTR reporting requirements

Our proposal

6.82 In our August 2020 Consultation we proposed to remove the requirement for telecoms providers who hold SMP in MCT to notify Ofcom annually of the MTR charged in the previous charge control year.

Stakeholder responses

6.83 Magrathea and Telefónica welcomed our proposal to remove the requirement to notify termination charges.²²⁴

Our reasoning and decision

6.84 In the 2018 MCT Market Review Statement we introduced an obligation for all telecoms providers who hold SMP in MCT to notify Ofcom annually of the MTR charged in the previous charge control year.²²⁵ The remedy was designed to allow us to monitor compliance and enforce against telecoms providers that did not comply with the charge control.

6.85 More specifically, the obligation was in response to a concern that a number of smaller MCT providers were not complying with our previous requirement for MCT providers to publish their MTRs on their website and to notify 28 days in advance of any changes to MTRs.

6.86 We proposed to remove this notification requirement for MCT on the grounds of proportionality. Since we introduced the requirement, we have not relied on this information significantly for the purpose of enforcement action. In view of this, and in line with our aim to make regulations less burdensome, we have decided to remove this requirement.

6.87 If we have reason to suspect non-compliance with the charge control, we can use our formal information gathering powers to request the relevant termination rate information from telecoms providers.

Financial reporting

Our proposal

6.88 In our August 2020 Consultation we proposed not to impose accounting separation and cost accounting remedies on MCT providers.

²²⁴ Magrathea response to August 2020 Consultation, page 3; Telefónica response to August 2020 Consultation, page 4.

²²⁵ Ofcom, 2018. *MCT Market Review Statement*, section 4.

Stakeholder responses

6.89 No stakeholders commented specifically on our proposals not to impose accounting separation and cost accounting remedies on MCT providers.

Our reasoning and decision

6.90 In line with our approach in previous MCT reviews, we do not consider that it would be proportionate to impose accounting separation and cost accounting remedies on MCT providers. We anticipate that the total cost of requiring each MCT provider to invest in and develop appropriate accounting separation and cost accounting systems could be significant.

WCT and MCT regulation on international calls

Our proposal

6.91 In our August 2020 Consultation, we proposed a reciprocity condition for setting termination rates for international calls, whereby the termination rate charged by the UK telecoms provider can be no more than the reciprocal termination rate charged by the relevant international telecoms provider for a call originating in the UK, or the UK domestic rate, whichever is the higher.

6.92 Since our consultation was published, the European Commission has brought in new legislation that determines fixed and mobile termination rates within the EU (Eurorates).²²⁶ This includes new rules on termination rates for calls from outside the EU, which will apply to calls from the UK.

Stakeholder responses

6.93 We received 12 responses to our consultation proposals for the regulation of termination rates for calls originated outside of the UK, from BT, FCS, ITSPA, Magrathea, Simwood, TalkTalk, Telecom2, Telefónica, Three, UKCTA, Virgin Media and Vodafone.

6.94 We wrote to all of the stakeholders that responded to our consultation to give them an opportunity to comment on the proposals from the European Commission about termination rates for international calls and whether it had an impact on their view of our consultation proposals. We received a further three responses (BT²²⁷, Telefónica²²⁸ and Virgin Media²²⁹) in response to this request. Where a respondent has changed its views about the reciprocity proposal from its initial response, we report its latest views as expressed in their Eurorates Response.

²²⁶ European Commission, 2020. [Commission adopted Delegated regulation on EU-wide voice-call termination rates](#) [Accessed 23 March 2021]

²²⁷ [BT \(Eurorates Response\)](#) response to the August 2020 Consultation.

²²⁸ [Telefónica \(Eurorates Response\)](#) response to the August 2020 Consultation.

²²⁹ [Virgin Media \(Eurorates Response\)](#) response to the August 2020 Consultation.

6.95 Most stakeholders agreed with our proposal for reciprocity in principle, with some providing additional comments on the principles underpinning our proposal. Some respondents raised several questions around the practical challenges of implementing reciprocity. We also received a number of comments that were beyond the scope of this market review. We summarise these responses in more detail below.

Principles of reciprocity

6.96 Most respondents to our consultation welcomed the reciprocity proposal in principle. BT, Telefónica, Three and Vodafone provided additional comments on the reciprocity condition.

International termination with EU countries

6.97 Telefónica and Three said that, instead of a reciprocity condition, the UK should seek to be added to the Annex list of the EC Delegated Act, in order to secure reciprocal low termination rates with the EU.²³⁰

- Telefónica and Three suggested this would likely require Ofcom to set a price cap on termination rates for calls originating from the EU.²³¹
- Telefónica said that this approach was the only long-term option for UK providers to benefit from EC regulation applying to calls originating from the EU.²³² [X]²³³
- Three said that should the UK fail to be added to the Annex list then it would support the reciprocity proposal, though it considered pricing freedom to be preferable. Three suggested that if pricing freedom were allowed, this may not lead to an increase in termination rates between UK providers and EU providers, because such increases would make it more difficult for providers to offer competitive international calling and roaming rates.²³⁴

6.98 BT and Vodafone supported the reciprocity proposal with respect to calls to and from the EU.²³⁵ BT also considered the UK to have an equivalent termination rate regime to the EU and should therefore be included on the Annex list of the EC Delegated Act.

International termination with non-EU countries

6.99 Three supported the reciprocity proposal for calls originating from non-EU countries, but suggested that Ofcom should go further and allow for pricing freedom. [X] Three argued that under pricing freedom, the ability of UK telecoms providers to charge non-EU

²³⁰ Telefónica (Eurorates Response) response to the August 2020 Consultation, paragraph 1.8; Three response to the August 2020 Consultation, paragraph 2.3.

²³¹ Three response to the August 2020 Consultation, paragraph 2.3; Telefónica (Eurorates Response) response to the August 2020 Consultation, paragraph 1.13.

²³² Telefónica (Eurorates Response) response to the August 2020 Consultation, paragraph 1.8.

²³³ [X]

²³⁴ Three response to the August 2020 Consultation, paragraphs 2.10-2.12.

²³⁵ BT (Eurorates Response) response to the August 2020 Consultation, paragraph 1.1; Vodafone response to the August 2020 Consultation, page 29.

providers high termination rates would result in stronger competition for UK retail consumers, and thus lead to lower retail prices for UK consumers.²³⁶

- 6.100 BT and Vodafone supported the reciprocity proposal with respect to calls originating from non-EU countries.²³⁷ However, Vodafone noted that, with respect to non-EU telecoms providers, the reciprocity condition would likely lead to similar outcomes as pricing freedom. Vodafone said that this is because UK providers are net senders of calls to international providers and would therefore have no incentive to increase the termination rates charged by providers on both sides.²³⁸

Implementation challenges of reciprocity

- 6.101 While most respondents welcomed the reciprocity proposal, they also raised concerns regarding various implementation challenges.
- 6.102 Some respondents told us that it can be difficult to determine the origin of a call due to missing, incomplete or malformed CLIs (BT, Telefónica and Three²³⁹) or that international telecoms providers may ‘spoof’ the CLI of a call to make it appear to come from a country or operator that would receive a lower termination rate (TalkTalk and Three).²⁴⁰
- 6.103 Some respondents highlighted that it can be difficult to determine what termination rate is being charged due to the opacity of international termination rates, and the use of intermediaries to transit international calls, and that telecoms providers cannot apply the correct termination rate for the relevant counterparty in these cases.²⁴¹
- 6.104 Virgin Media said if a telecoms provider is unable to charge differential termination rates for calls of different origins, then the advantages of reciprocity identified by Ofcom would not be realised and could lead to distortions across the market.²⁴²
- 6.105 [redacted]²⁴³
- 6.106 Other issues raised about the implementation of the reciprocity condition include:

²³⁶ Three response to the August 2020 Consultation, paragraphs 2.14-2.15.

²³⁷ BT response to the August 2020 Consultation, page 17; Vodafone response to the August 2020 Consultation, page 29.

²³⁸ Vodafone response to the August 2020 Consultation, paragraph 3.36.

²³⁹ BT response to the August 2020 Consultation, page 17; Telefónica response to the August 2020 Consultation, paragraphs 3.9-3.10; Three response to the August 2020 Consultation, paragraph 2.16.

²⁴⁰ TalkTalk response to the August 2020 Consultation, paragraph 5.2; Three response to the August 2020 Consultation, paragraph 2.16.

²⁴¹ Three response to the August 2020 Consultation, paragraph 2.16; ITSPA response to the August 2020 Consultation, page 9; Simwood response to the August 2020 Consultation, page 19; BT response to the August 2020 Consultation, page 17. BT also noted that not all UK providers have international gateways and those that do not have one will be using services of a UK transit provider with international gateways, with no knowledge of which surcharge rate is being applied by the foreign carrier.

²⁴² Virgin Media response to the August 2020 Consultation, page 2.

²⁴³ [redacted]

- Difficulty in identifying the originating network for ported numbers.^{244,245}
 - ITSPA and Simwood said that for some providers applying a surcharge on internationally originated calls will require BT's permission, and that it may not be in BT's interests to agree.²⁴⁶
- 6.107 Some respondents therefore called for guidance or further clarity from Ofcom on those implementation issues²⁴⁷, such as the termination charges to apply when there is imperfect information, or suggested an industry approach.²⁴⁸
- 6.108 For instance, BT and Three suggested that Ofcom should allow UK operators to either apply a default high rate on, or have complete pricing freedom over, calls with missing, incomplete, or malformed CLIs, or where the CLIs can be identified as having been spoofed.²⁴⁹ BT also suggested UK transit providers should publish their surcharge rates if one is applied.²⁵⁰
- 6.109 BT highlighted that each third country may have multiple telecoms providers, with different fixed and mobile termination rates. It suggested that for the ease of billing, a UK transit telecoms provider should be able to choose to charge a 'blended rate' of termination charges to other UK telecoms providers when handing their international transit. It asked Ofcom to provide guidance on the calculation of such blended rates.²⁵¹
- 6.110 Three asked that Ofcom allows enough time to identify and react to changing termination rates from international providers, for example by requiring providers to ensure reciprocity on a quarterly basis.²⁵²
- 6.111 [X].²⁵³

²⁴⁴ BT response to the August 2020 Consultation, page 17. BT said that differential surcharge rates between telecoms providers for termination of fixed calls will create a differential on calls to UK customers that have ported their numbers. It suggested that industry should consider whether the interconnect model for ported fixed calls should move to the "donor pays all" model used by mobile telecoms providers.

²⁴⁵ Three response to the August 2020 Consultation, paragraph 2.16. A customer of an international provider may port their telephone number from one provider ('Provider A') to another ('Provider B'). When that international customer makes a call to a UK number, the UK provider responsible for terminating the call will be able to identify Provider A, but not the provider that originated the call (Provider B). Three noted that where customers from international providers port their mobile number, it would see the 'A-number' of the original donor provider. Three proposed that Ofcom explicitly allows charging MTRs based on the A-number for these cases.

²⁴⁶ ITPSA response to the August 2020 Consultation, page 9; Simwood response to the August 2020 Consultation, pages 18-19.

²⁴⁷ BT response to the August 2020 Consultation, page 17. BT asked Ofcom to consider convening an industry forum or workshop prior to implementation in April 2021.

²⁴⁸ Three response to the August 2020 Consultation, paragraph 2.16; ITSPA response to the August 2020 Consultation, page 9; TalkTalk response to the August 2020 Consultation, paragraph 5.2.

²⁴⁹ BT response to the August 2020 Consultation, page 17; Three response to the August 2020 Consultation, paragraph 2.16.

²⁵⁰ BT response to the August 2020 Consultation, page 17.

²⁵¹ BT response to the August 2020 Consultation, page 17.

²⁵² Three response to the August 2020 Consultation, paragraph 2.16.

²⁵³ [X]

Other concerns raised by stakeholders

- 6.112 BT asked for clarification on the treatment of 03, 070 and 08 number ranges. BT believed that while the international call volumes terminating on such numbers are currently low, they should nonetheless be subject to the reciprocity condition to prevent telecoms providers from bypassing the cost associated with geographic international transit through non-geographic fixed numbers.²⁵⁴
- 6.113 Simwood said the relevant definitions in the legal instruments appear ambiguous with respect to a group structure and considered there to be a risk of unintended consequences.²⁵⁵
- 6.114 Some respondents raised concerns that are outside of Ofcom's jurisdiction or beyond the scope of this review:
- Telefónica asked that Ofcom evaluates and discourages the practice of other EEA providers applying mark-ups to the rates for which they are legally obliged to terminate calls to their mobile customers.²⁵⁶
 - Telecom2 asked for Ofcom to regulate retail charges for mobile use outside of the EEA.²⁵⁷
 - UKCTA urged Ofcom to remind other national regulators that, in its view, differentiated rates based on origin go against the most-favoured-nation principle of the WTO General Agreement on Trade in Services (GATS), which the EU has adopted.²⁵⁸
 - BT suggested the inclusion of number ranges used by Crown Dependencies in the proposed reciprocal charging model.²⁵⁹

Our reasoning and decisions

Background

- 6.115 In the 2017 NMR Statement and 2018 MCT Market Review Statement, we set a single charge control on fixed termination rates, and a single charge control on mobile termination rates, regardless of the origin of the call.²⁶⁰
- 6.116 In our August 2020 Consultation, we considered whether UK regulation should be changed to allow for more pricing flexibility for UK providers when terminating calls that originate outside the UK. We proposed a reciprocity condition on the basis that it would be most likely to deliver reciprocal low termination rates between the UK and international providers, which we considered was the best outcome for consumers.

²⁵⁴ BT response to the August 2020 Consultation, page 17.

²⁵⁵ Simwood response to the August 2020 Consultation, page 19.

²⁵⁶ Telefónica response to the August 2020 Consultation, paragraphs 3.14-3.16.

²⁵⁷ Telecom2 response to the August 2020 Consultation, page 5.

²⁵⁸ UKCTA response to the August 2020 Consultation, paragraph 26.

²⁵⁹ BT response to the August 2020 Consultation, pages 17-18.

²⁶⁰ Ofcom, 2018. *MCT Market Review Statement*, section 4.

- 6.117 In August 2020, after the publication of our consultation, the European Commission (EC) published a draft Delegated Act to be made under Article 75 EECC, which proposed the specific termination rates which providers in the EU must apply for terminating all voice calls, including calls to certain non-geographic numbers, within the EU (Eurorates).²⁶¹ The Delegated Act was adopted on 18 December 2020.²⁶²
- 6.118 The Delegated Act requires termination rates for calls originating from outside the EU to be set at the relevant Eurorates if one of two conditions are satisfied. The two conditions are as follows:
- the termination rate of the third country telecoms provider for calls originating in an EU Member State is equal to or lower than the relevant Eurorate in that EU Member State ('Condition 1.4a'). Satisfaction of this condition is within the control of individual third country telecoms providers; or
 - the Commission determines that termination rates in the third country for calls originating in the EU are regulated in accordance with principles equivalent to those set out in Article 75 and Annex III to the EECC (which govern the setting of Eurorates), and the third country is listed in the Annex of the Delegated Act ('Annex list'). It would be for the UK to satisfy the Commission that this condition is met and if it did so, all UK providers would be charged Eurorates for UK originated calls terminating in the EU.²⁶³
- 6.119 Under the charge controls we have set out in this statement:
- The UK fixed termination rates should remain below the fixed Eurorate throughout the review period;²⁶⁴
 - The UK mobile termination rates will be lower than most of the mobile Eurorates for the first two or three years of the review period²⁶⁵, but higher thereafter as the Eurorates falls to a harmonised rate of 0.2 eurocents per minute; and
 - The UK termination rates for calls to 070 numbers, which are subject to a charge control aligned with the UK mobile termination rate charge control, will be higher than the applicable Eurorate for fixed calls, throughout the market review period.
- 6.120 A UK provider could therefore only satisfy the first condition for obtaining Eurorates for mobile and 070 calls if they voluntarily lowered their mobile and 070 termination rates below the UK regulated rate(s).

²⁶¹ European Commission, 2020, [Draft Delegated Act on Union-wide voice call termination rates](#) [Accessed 24 March 2021]

²⁶² European Commission, 2020. *Commission adopted Delegated regulation on EU-wide voice-call termination rates.*

²⁶³ European Commission, 2020. [Delegated Act on Union-wide voice-call termination rates](#) [Accessed 23 March 2021].

²⁶⁴ Comparisons between UK termination rates and Eurorates are complicated by the fact that Eurorates are specified in euros or other European currencies.

²⁶⁵ Depending on the GBP/EUR exchange rate. The Eurorates associated with some countries, such as Sweden and Cyprus, are lower than the UK rates throughout the review period at the current (23 March 2021) exchange rates.

Consumers benefit most from reciprocal low termination rates

- 6.121 In our view UK consumers would benefit most in a scenario where the termination rate in the destination country is low and the termination rate in the UK is low (reciprocal low rates).
- 6.122 Low rates in the destination country will reduce the cost of making calls from the UK to that country and will help ensure that call prices are low for customers calling that country from the UK. Low termination rates will also reduce the cost of providing inclusive roaming services (such as ‘roam like at home’) in that destination country and we consider that inclusive roaming services are more likely to be maintained if termination rates remain low.
- 6.123 The impact on UK consumers of changes in UK termination rates for incoming international calls is more ambiguous as these charges are paid by the international counterparty when its customers call the UK. Higher termination charges for international calls that terminate in the UK could have both positive and negative impacts on UK consumers:
- **UK consumers could benefit from a ‘waterbed effect’.** High UK termination charges on international calls would increase UK telecoms providers’ termination profits, which could make UK consumers better off if these were passed onto them through lower retail prices and/or more investment in the quality of the service received (the ‘waterbed effect’).
 - **UK consumers may receive fewer calls from outside the UK.** High UK termination charges on international calls could be passed on to retail prices in those countries and higher retail prices in those countries could reduce the number of calls received by UK consumers, to the detriment of UK consumers who value those calls.
- 6.124 The consumer benefit of the waterbed effect is difficult to determine. In the academic literature, there is a strong theoretical prediction of a negative relationship between termination rates charged to fixed telecoms providers and retail prices for mobile customers.²⁶⁶ The underlying theory is that if high mobile termination charges lead to greater profits for mobile providers, they will have an incentive to set lower retail charges in order to win more mobile customers and earn more termination revenue. However, the extent of the waterbed effect is difficult to measure and some profits may be retained by telecoms providers.²⁶⁷

²⁶⁶ See, for example, Genakos, C. and T. Valletti, 2015, ‘Evaluating a decade of mobile termination rate regulation’, *Economic Journal*, F33, which states that the negative relationship between termination rates charged by mobile providers to fixed providers and prices paid by mobile customers is “a rather strong theoretical prediction that holds under many assumptions about the details of competition among Mobile operators.”

²⁶⁷ Genakos and Valletti found that using data from 2002 to 2006, when revenues from termination rates charged to fixed telecoms providers were high, there was a significant negative relationship between termination rates and mobile prices. This relationship became insignificant when an extended dataset from 2002 to 2011 was used. Genakos and Valletti attributed their finding that a waterbed effect was no longer significant using more recent data to the diminishing importance of fixed to mobile calls relative to mobile to mobile calls. However, in these studies, Genakos and Valletti measure the overall impact of reduced MTRs on mobile prices in a scenario where there is no differentiation of MTRs depending on the source of the call (i.e. fixed or mobile). Their results did not isolate the impact of the waterbed effect

- 6.125 The consumer harm caused by higher termination rates on calls received is also difficult to determine. If UK telecoms providers increase termination rates, there may also be harm to UK consumers if those termination rate increases lead to a reduction in the total number of calls UK consumers receive from abroad. Where UK termination rate increases lead to higher prices on calls to the UK, but these calls are still made or they cause international callers to switch to OTT when calling the UK, this would not necessarily harm UK consumers.²⁶⁸ The magnitude of the harm would therefore depend on the extent to which termination rate increases would be passed through to retail prices on calls to the UK, how responsive callers to the UK are to increases in retail prices, whether those callers switch to OTT, and how much UK consumers value any calls foregone.
- 6.126 Three said that providers should be given pricing freedom and that even if this leads to reciprocal high rates, the waterbed effect would intensify the competition for retail customers, leading to lower retail prices.²⁶⁹ We do not agree with this assessment as it ignores the harm to UK consumers caused by high termination rates in the destination country and the potential harm from a reduced volume of calls received by UK consumers as a result of high UK termination rates.
- 6.127 Overall, we remain of the view that reciprocal low rates deliver the best outcomes for UK consumers. Low termination rates are likely to result in lower prices for UK consumers making international calls and, in terms of mobile termination rates, most likely to result in inclusive roaming being sustained. Low termination rates would also enable a high number of calls to the UK. In addition, reciprocal low termination rates are the most desirable outcome from the perspective of efficient pricing and overall consumer welfare.
- 6.128 In contrast, scenarios with high termination rates charged on calls from the UK result in some consumer harm. Whether UK telecoms providers also charge high termination rates ('reciprocal high rates') or maintain low rates (a 'low-high outcome'), this would result in higher prices for UK consumers making international calls and could put pressure on the sustainability of inclusive roaming services.
- 6.129 It is more difficult to determine whether UK consumers would be better off when comparing reciprocal high rates and a low-high outcome. The main difference between the scenarios is a trade-off between the volume of calls received (which may fall if termination rates for calls to the UK are high) and the benefit of higher UK profits leading to a waterbed effect (which can only happen if termination rates for calls to the UK are high). As mentioned earlier, the magnitude of both of these effects is difficult to determine.

(where high MTRs for fixed to mobile calls could result in lower mobile prices), from the 'competition effect' (where high MTRs for mobile to mobile calls can lead to increases mobile prices). See Genakos, C. and T. Valletti, 2015. *Evaluating a decade of mobile termination rate regulation*, Economic Journal.

²⁶⁸ In Section 5 we described why the impact of a SSNIP in the termination rate would be unlikely to alter consumer behaviour if passed onto retail prices. However, the potential increases in termination rates by UK telecoms providers discussed here could be much greater than a SSNIP, and thereby could impact the number and type of calls to the UK.

²⁶⁹ Three response to the August 2020 Consultation, paragraphs 2.14-2.15.

Reciprocity is the approach most likely to achieve reciprocal low termination rates

- 6.130 In our August 2020 Consultation we said that an approach to regulation based on reciprocity was most likely to result in reciprocal low termination rates. Reciprocity will prevent UK providers raising their termination rates, where a counterparty keeps their own rate low. The ability of UK telecoms providers to respond to high rates will also help deter providers abroad from charging a high termination rate for calls from the UK.
- 6.131 We rejected the option of capping charges for all calls, regardless of origin, at the UK domestic rate because the ability of international providers to raise their own rates, without provoking a response from UK providers, would be more likely to lead to high rates for calls from the UK.
- 6.132 We also rejected the option of allowing UK providers to set rates freely for international calls because this would be likely to lead to reciprocal high rates in circumstances where the UK provider would prefer that outcome (e.g. because it has a large net inflow of call traffic from that country).
- 6.133 We do not agree with Three that pricing freedom is preferable to reciprocity. We cannot dismiss the possibility that a UK provider might prefer reciprocal high termination rates (e.g. because of a net traffic inflow). If that is the case, then pricing freedom would allow UK providers to bring high termination rates about, to the detriment of UK consumers.
- 6.134 We recognise that there may be circumstances where a reciprocity requirement on UK providers will not prevent high termination rates. This could be the case where an international counterparty has pricing freedom and where it prefers reciprocal high termination rates. However, we are of the view that reciprocal low rates are more likely under a reciprocity condition than under any alternative approach. Low termination rates are plausible in certain scenarios (for example, where traffic is roughly balanced and where telecoms providers have the incentive to maintain roaming agreements). Although the outcome with these telecoms providers could also be reciprocal high rates, we consider this no worse than the low-high outcome that could result if we were to maintain the current approach to regulation.

Relationship between our decision and the Delegated Act

- 6.135 We consider that our decision to impose a reciprocity condition will offer the best chance of supporting reciprocal low termination rates for calls between the UK and the EU under the Delegated Act.
- 6.136 As noted above, the Delegated Act provides two conditions under which reciprocal low termination rates can be secured between UK and EU providers. Condition 1.4a can be satisfied by individual UK telecoms providers. Alternatively, the UK can apply to be added to the Annex list, which would secure reciprocal low rates for all UK providers.

Condition 1.4a

- 6.137 Under Condition 1.4a, UK providers can benefit from low termination rates if they keep their own termination rate at or below the level set for that country in the Delegated Act

(i.e. the relevant Eurorate for that Member State). Where UK providers prefer low rates (as might be the case if there is a net outflow of calls to that Member State from the UK) then they can use Condition 1.4a in the Delegated Act to secure that outcome.

- 6.138 In the alternative scenario where the UK provider prefers reciprocal high rates (e.g. because there is a large net inflow of call traffic to the UK from that Member State) then European counterparties can ensure they are charged the UK domestic rate for call termination by keeping their own rates at or below that level; in which case the UK reciprocity condition will prevent UK providers from charging more than the domestic termination rate.
- 6.139 We therefore expect that the reciprocity approach will offer the best chance of ensuring reciprocal low termination rates for calls between the UK and the EU.

Annex list

- 6.140 We note that a number of stakeholders are in favour of the UK applying to be added to the Annex list. This would have some advantages for UK providers if the UK were to be listed, in that they could charge the UK domestic termination rate for calls from the EU and still be eligible for the relevant Eurorate for calls that they terminate in EU Member States. This is a potentially more straightforward way of ensuring reciprocal low termination rates, as it would remove the need for UK providers to charge different rates for UK and EU calls and remove the need to adjust that rate when there are currency fluctuations.
- 6.141 It is for the UK Government to decide whether it will apply to be added to the Annex list. Any application process would take some time since it requires an assessment of whether UK termination rates for calls from the EU are regulated in accordance with principles equivalent to those used to set Eurorates, followed by an amendment to EU legislation to list the UK within the Annex.²⁷⁰
- 6.142 Should the UK Government decide to make an application for the UK to be added to the Annex list, we would support the UK Government as necessary. We also recognise that should the UK make an application it may be necessary to re-visit some of the regulations we have set out in this statement. If that happens, and it is in the interests of UK consumers to do so, we will specify any necessary amendments in a further consultation.
- 6.143 In the meantime, as discussed above, UK providers can secure low termination rates for calls that terminate in the EU under Condition 1.4a.

Implementation of reciprocity

- 6.144 In response to the concerns raised by respondents on the challenges of implementing the reciprocity condition, we set out below some of the implementation details of reciprocity.
- 6.145 **Masked, missing, incomplete and fraudulent CLI:** To ensure that the correct termination rate is charged by the UK telecoms providers and to incentivise originating providers to

²⁷⁰ In particular, the European Commission will assess whether, on the basis of information provided by the UK, voice termination rates for calls originated from Union numbers and terminated to numbers in the UK are regulated in accordance with principles equivalent to those set out in Article 75 of Directive (EU) 2018/1972 and Annex III thereto.

provide complete CLI, we agree with the suggestion made by Three and BT that UK telecoms providers should have pricing freedom on the termination rate for calls with masked, missing, incomplete, or fraudulent CLI.²⁷¹ However, we would expect UK telecoms providers to take reasonable steps to identify the correct CLI, so as to apply the correct termination rate to charge. Providers should only set a termination rate without constraint if the reasonable steps that they have taken do not disclose the CLI they require.

- 6.146 **Opacity of international termination rates and transit charges:** We accept that there may be limited transparency about termination rates charged by non-UK telecoms providers. However, we consider that obtaining the information needed to identify the termination rates they are being charged is the responsibility of each telecoms provider through their commercial arrangements. Therefore, we consider that industry is best placed to resolve this issue.
- 6.147 **Capability to charge differential termination rates:** We recognise the possibility that some providers may need to change their systems to enable them to take advantage of the flexibility provided by a reciprocity condition. This would be a commercial decision for those providers. We note that it would also be necessary to incur these costs in order to take advantage of pricing freedom and that regulating termination rates for calls regardless of origin would allow no flexibility for providers.
- 6.148 **BT cooperation required to apply reciprocal WTR:** It is the responsibility of telecoms providers to ensure that their commercial arrangements, including those with their transit providers, allow them to comply with their regulatory obligations in relation to their termination rates.
- 6.149 **Blended rate:** On BT's proposal that a 'blended rate' can be charged by UK transit providers for billing convenience, our view is that a blended rate would likely breach the reciprocity condition as the blended rate will be higher than the counterparty termination rate for some countries.
- 6.150 **Ported numbers:** Three expressed its inability to identify the true number holder of a ported number, and is only able to apply the relevant MTR for the original number range holder. We accept that ported numbers may add an additional step into the process of determining the appropriate termination rate to charge, but we consider that it is the responsibility of the UK telecoms provider to take reasonable steps through its commercial arrangements to identify the appropriate termination rates.
- 6.151 **Buffer time:** We accept Three's concern that reciprocal changes in termination charges cannot immediately come into effect following a rate change by a third country telecoms provider. We therefore consider that a UK telecoms provider should reciprocate any rate change as soon as is reasonably practicable.
- 6.152 [X].

²⁷¹ This is similar to the approach adopted by the EU in the EC Delegated Act, paragraph 15: "Union operators should receive a valid CLI assigned to every incoming call. Consequently, Union operators would not be bound to apply Union-wide termination rates to termination of calls if the CLI is missing, invalid or fraudulent."

6.153 Some respondents have called for further action by Ofcom to support the implementation of the reciprocity proposal, for example by providing guidelines, convening industry workshops, or consulting on implementation details. We have provided guidance and clarification on the various implementation concerns in this section. We currently do not see any areas where industry workshops overseen by Ofcom appear necessary, but will continue to assess whether additional measures would be necessary in light of the experience of implementation.

Other concerns raised by stakeholders

- 6.154 On BT's suggestion that non-geographic number ranges should also be subject to the reciprocity condition, non-geographic numbers, with the exception of mobile numbers and the 070 range, are outside of the scope of our market definition and, subject to these exceptions, we have not found SMP in relation to non-geographic numbers as part of this review.²⁷² It therefore would not be appropriate or proportionate to extend WCT regulation to non-geographic number ranges, especially given BT reports that the international call volumes terminating on such numbers are currently low.
- 6.155 On Simwood's concern about ambiguity in the definitions in the legal instruments with respect to a group structure, this is likely to be addressed by section 32(4) of the Communications Act, which we consider applicable to the interpretation of the terms "Dominant Provider" and "International Call Provider".²⁷³

²⁷² Competitive conditions for non-geographic number ranges (i.e. the 08x, 09x and 118 number ranges) are different to those for geographic numbers. See for example Ofcom's 2013 [Simplifying non-geographic numbers statement](#). [Accessed 23 March 2021]

²⁷³ Section 32(4) of the Act provides, *inter alia*, that where one or more persons are employed or engaged to provide the network or service under the direction or control of another person, the provider of the network or service is that other person.

7. WCT: interconnection

- 7.1 Interconnection is the linking of one network to another to enable end-users of different networks to communicate with one another. Telecoms providers require interconnection to access wholesale call termination (WCT) services.
- 7.2 Having set out in Section 5 our decision that all providers have SMP in WCT in each market applicable to that provider, and in Section 6 the remedies we are setting to address that SMP, we now consider whether additional regulation is needed for interconnection in order to ensure our WCT remedies are effective. In making our assessment, we have considered the impact of the forthcoming migration of voice services from the current, time division multiplexing (TDM) technology networks to modern internet protocol (IP) networks.
- 7.3 In view of the particular characteristics of BT's SMP, we have decided to apply specific interconnection remedies to address its SMP in the WCT market. These remedies are summarised in Figure 7.1 below. Given BT's planned migration to IP-based technology in this market review period, our regulation of BT's TDM interconnection services will come to an end on 1 April 2025. We are also imposing regulations in relation to BT's IP interconnection services, including transparency obligations about its migration timetable.
- 7.4 Having considered responses to our August 2020 Consultation and other stakeholder submissions, we have implemented the proposals we made in our August 2020 Consultation subject to the following changes:
- Clarificatory amendments to our guidance on the fair and reasonable charges obligation for IP interconnection.
 - BT will not be required to publish Key Performance Indicators (KPIs) for IP interconnect circuit provisioning, given that order volumes are likely to be low.
 - To give BT time to implement the remedies we are imposing for IP interconnection, the obligation to publish transparency measures for IP interconnection, notably to publish a reference offer for IP interconnection, will apply from 1 October 2021.
- 7.5 For telecoms providers other than BT, we are imposing the network access condition applying to WCT, which also requires telecoms providers to provide such associated facilities as are reasonably necessary and requires those facilities to be provided on fair and reasonable terms, conditions and charges. Such associated facilities include interconnection, accommodation and related services required to access WCT.

Figure 7.1: Summary of our decisions for specific interconnection remedies for WCT on BT

Remedies for the review period (2021-2026)	TDM	IP
Network access obligation	Yes	Yes
Requirement not to discriminate unduly	Yes	Yes
Publish a reference offer	Yes	Yes
Requirement to notify charges	Yes	Yes
Accounting separation	Yes	Yes
Cost accounting	Yes	Yes
Transparency as to quality of service	Yes	Yes
Charge control on TDM interconnect circuits ²⁷⁴	Yes	
Fair and reasonable charges obligation for IP interconnection, supplemented by guidance		Yes
Prohibition of additional charges		Yes
Transparency obligation concerning BT's timetable for migration of point of connections (POCs) for WCT to its IP network		Yes

Source: Ofcom.

Background

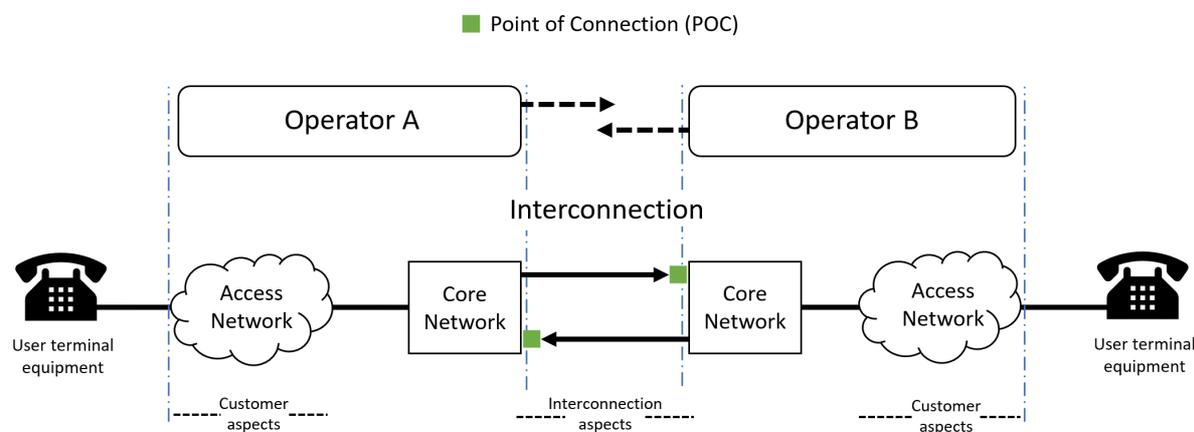
Overview of interconnection

- 7.6 Interconnection refers to the physical infrastructure and services which enable telecoms providers to connect with each other, in order for their customers to make or receive calls. Interconnection is relevant to our regulation of WCT, because in order for a telecoms provider to access the regulated fixed termination rate (FTR) for call termination, it needs to interconnect in the manner that is specified by the terminating telecoms provider.²⁷⁵
- 7.7 Telecoms providers interconnect their networks to pass calls between their customers, allowing these calls to be terminated, or received, on customers' phones as illustrated in Figure 7.2 below.

²⁷⁴ The charge control will apply until the earlier of (i) one month from the date when the migration of number blocks from a BT Digital Local Exchange (DLE) to an IP point of connection (POC) is completed; and (ii) 1 April 2025.

²⁷⁵ All telecoms providers have obligations related to interconnection under General Condition A1 (GC A1), which states that: "This condition requires all providers of public electronic communications networks to negotiate interconnection agreements with other network providers on request and requires all communications providers to respect the confidentiality of information obtained in connection with network access negotiations." Ofcom, [Unofficial consolidated version of General Conditions of Entitlement](#) as at 24 March 2021. [Accessed 25 March 2021]

Figure 7.2: Interconnection and termination



Source: Ofcom.

Interconnection technology

- 7.8 Traditionally, fixed telephone services in the UK have been provided using dedicated circuit-switched telephone networks, which use Time Division Multiplexing (TDM) technology. However, over the last decade, a technology transition has been underway as telecoms providers have begun to transfer services to modern IP networks that use a common infrastructure for both broadband and telephone services.
- 7.9 During the initial phase of this transition, telecoms providers deployed core IP networks but maintained the traditional analogue service presentation for telephone services. More recently, telecoms providers have begun to dispense with analogue services presentation and to deliver IP-based telephone services to customers' premises over broadband connections (sometimes referred to as 'all-IP').
- 7.10 While many telecoms providers (including major operators such as Sky and TalkTalk) have already transitioned their core networks from TDM to IP, other major telecoms providers (including BT and Virgin Media) currently provide most of their fixed line telephone services using TDM networks. During the next few years, the remaining telecoms providers will transfer their fixed line telephone services to IP core networks and most operators will transition from analogue service presentation to broadband service presentation.

Wholesale call termination on TDM networks

- 7.11 Fixed line TDM networks are dedicated networks whose principal function is to connect telephone calls. They have distinct switching elements, typically comprising of:
- **Local exchange elements** – switching elements to which customer lines are directly or indirectly connected, and which provide call origination, call termination, and local switching functions for those customers; and

- **Tandem switching elements** – larger networks generally have additional switching elements which connect calls between local exchange elements.
- 7.12 WCT is made available at the local exchange elements as these are the closest point to end-users' telephone lines where access can be provided.
- 7.13 In BT's network, the local exchange elements are its over 600 Digital Local Exchanges (DLEs) located around the UK. Other telecoms providers wishing to terminate geographic calls on BT's network must interconnect at each of BT's DLEs in order to have access to WCT and therefore only be charged the regulated fixed termination rate. Alternatively, telecoms providers can reduce their network requirements by interconnecting at the tandem layer of BT's network, in which case BT also provides additional tandem switching and conveyance services to deliver calls to the DLEs. At present, BT provides these services on a commercial basis.

Wholesale call termination on IP networks

- 7.14 In contrast to TDM networks, IP networks are multipurpose networks that provide data services such as broadband internet access as well as telephony. Unlike TDM networks, they do not have dedicated switching functions to connect calls. Instead, calls are encoded as IP packets and conveyed across a common IP network infrastructure that is used for all services.²⁷⁶
- 7.15 IP network architecture differs from that of TDM networks in two other important respects that are relevant to interconnection and WCT:
- IP networks typically have a small number of points of connection (POC) located at core network nodes, which are remote from most end-users' fixed lines. For example, BT's IP network has around 15 POCs. It also permits interconnection via internet peering or via an internet peering partner.²⁷⁷
 - Call conveyance costs are generally considered not to be strongly distance dependent because telephony traffic is usually a tiny fraction of the overall volume of data traffic carried by the network.
- 7.16 Consequently, some telecoms providers make WCT available at multiple POCs.

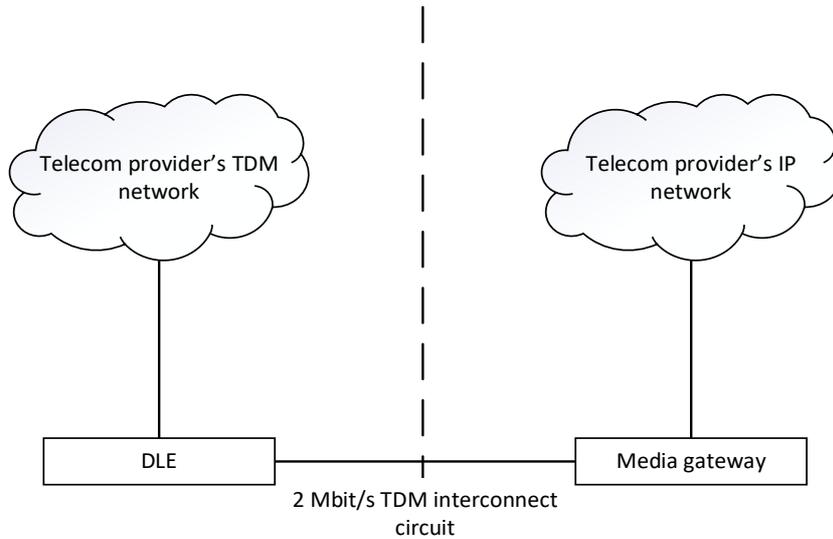
Interconnection between TDM and IP networks

- 7.17 TDM and IP networks use different communications protocols and data formats for call control and transport. Translation is therefore required to facilitate interconnection between TDM and IP networks, adding to the cost of interconnection. This translation is carried out by equipment called a media gateway as illustrated in Figure 7.3 below.

²⁷⁶ Telephone services are controlled by network elements known as call servers which are responsible for call setup and teardown. These network elements typically serve large numbers of end-users and are located at the core of the network, remote from most end-users' fixed lines.

²⁷⁷ BT, 2020. BT [IP Exchange Technical Description, Appendix A](#), version 6.5, [Accessed 17 February 2020] (login required to access).

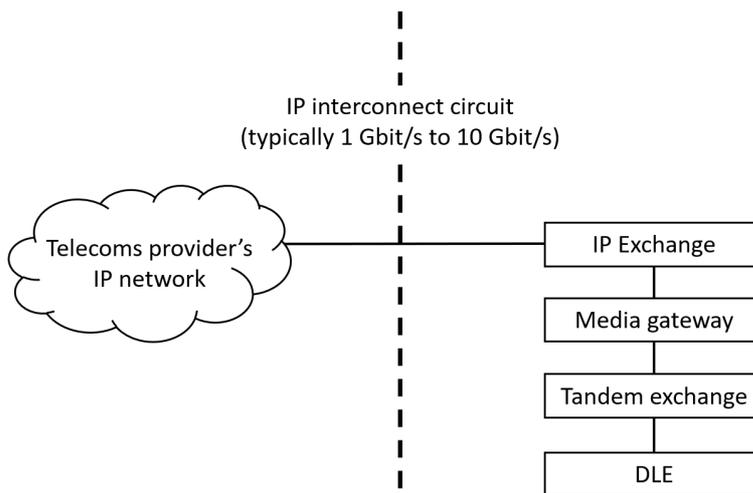
Figure 7.3: TDM interconnection between a TDM network and an IP network



Source: Ofcom.

7.18 A telecoms provider with an IP network wishing to terminate geographic calls to numbers residing on BT’s TDM network could therefore deploy its own media gateways and use TDM interconnect circuits to interconnect at BT’s DLEs or tandem exchanges as discussed above. Alternatively, it could use BT’s IP Exchange service (IPEX). BT would then provide the media gateways and convey the converted traffic to the DLE supporting its customer as illustrated in Figure 7.4 below. This approach minimises the network requirements for the telecoms provider. BT currently provides this service on a commercial basis.

Figure 7.4: IP interconnection to BT’s TDM network



Source: Ofcom.

BT's migration process

- 7.19 Openreach plans to withdraw Wholesale Line Rental (WLR) services by 2025 in preparation for the withdrawal of BT's TDM Network.
- 7.20 For interconnection purposes, calls will continue to be routed between networks on the basis of number block allocations.²⁷⁸ As part of its migration to an IP-based network, BT will therefore transfer the POC at which WCT is made available to its IP network on a number block basis. After allowing time for telecoms providers to make the necessary preparations, BT will transfer the POC for number blocks from the relevant DLE to its IP network. In order to access WCT, other telecoms providers will then reconfigure their networks to route calls to the number blocks in question to BT's IP network.
- 7.21 We discuss BT's plans for interconnection migration in more detail later in this section.

Overview of interconnection services provided by BT

- 7.22 The interconnection services provided by BT in support of WCT are relevant to our consideration of remedies. We therefore provide an overview of these services.

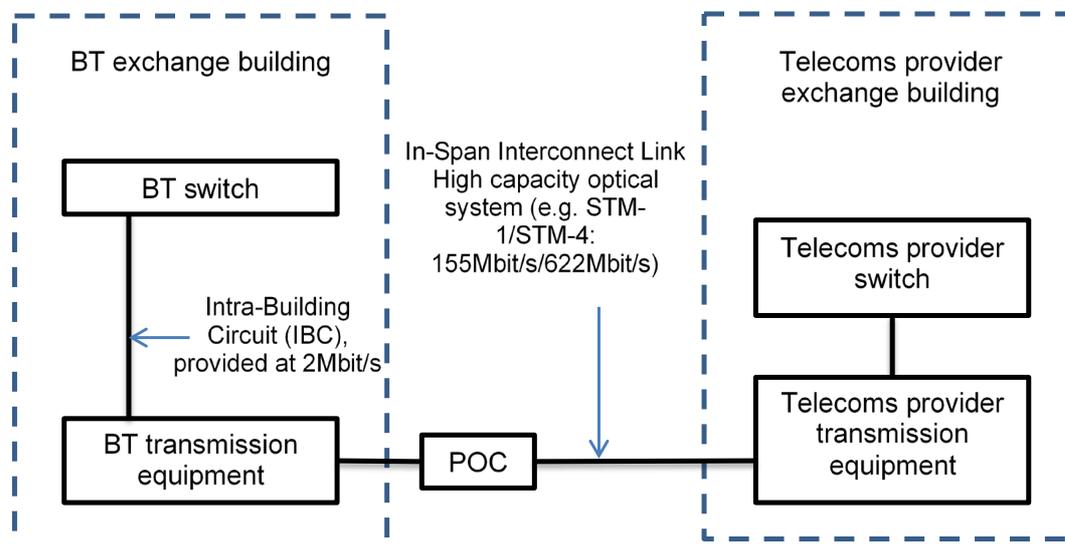
TDM interconnection

- 7.23 BT currently supports the following four types of interconnect circuit, using TDM technology:
- **In-Span Interconnect (ISI):** to provide ISI, a telecoms provider builds its own network up to a Point of Connection (POC), generally located just outside the BT exchange. BT then connects its network to the POC. Individual interconnect circuits, of 2 Mbit/s capacity, are then provided via the ISI link. An Intra Building Circuit (IBC) of 2 Mbit/s capacity is required to connect the ISI circuit to BT's switch. The ISI configuration is shown below in Figure 7.5.
 - **Interconnect Extension Circuit (IEC):** IECs allow a telecoms provider to extend its interconnection with BT from a POC provided via ISI (as above) to another switch site. IECs are provided at 2 Mbit/s capacity and again require IBCs.
 - **Customer Sited Interconnect (CSI):** CSI does not require any infrastructure to be built by the telecoms provider. Instead, BT builds to the telecoms provider's site. Individual 2 Mbit/s interconnect circuits are then provided via this CSI link as required. Once again, IBCs are also required. The telecoms provider can use the BT-provided CSI infrastructure to interconnect to other BT exchanges.

²⁷⁸ Telecoms providers obtain geographic telephone numbers from Ofcom in blocks (generally of 10,000 or 1,000 numbers). These blocks are also used for call routing for interconnection purposes. For each number block, the telecoms provider holding the block specifies where WCT may be obtained. On BT's TDM network, each number block is associated with a particular DLE. A small proportion of BT's number blocks already reside on its IP network. For these number blocks the relevant POCs are the IPEX POCs.

- **Virtual Interconnect Circuits (VICs):** VICs enable customers to interconnect using ISI or CSI to a tandem exchange where BT then provides a ‘virtual’ circuit across its network to connect to another BT exchange (e.g. a DLE).²⁷⁹

Figure 7.5: ISI Link Architecture



Source: Ofcom.

IP interconnection

7.24 BT currently supports three methods of IP interconnection in the UK:

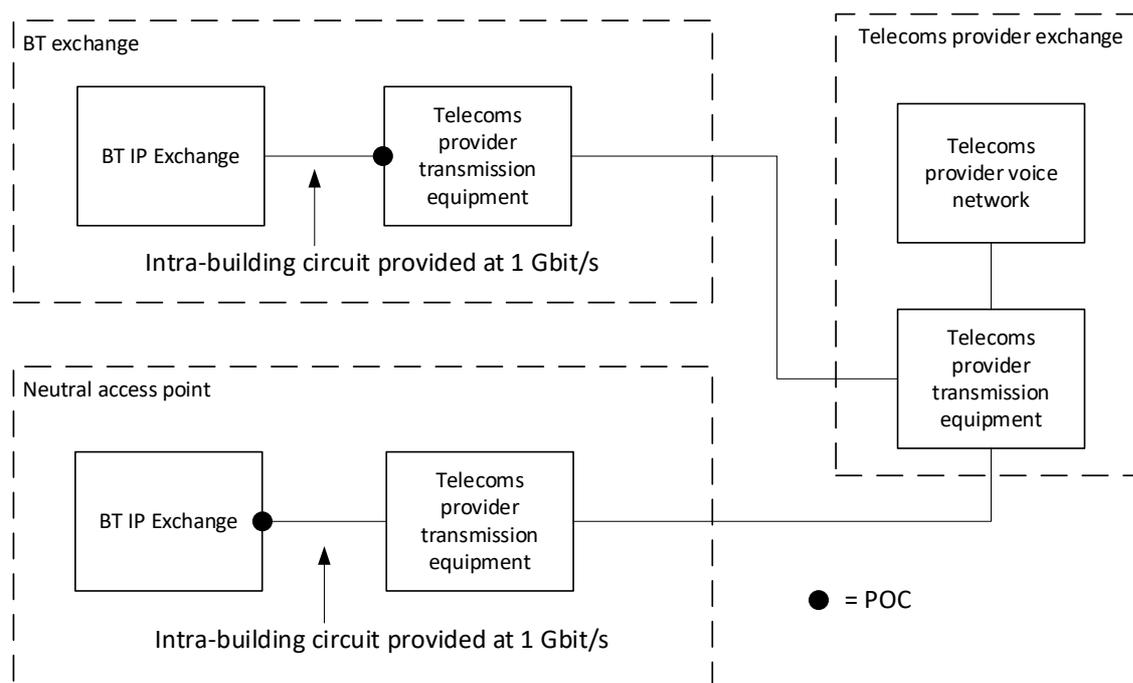
- **Direct access at BT exchanges:** a telecoms provider builds its own network to one of the exchanges at which BT provides IP interconnection. The POC is the telecom provider’s network terminating equipment (NTE) located in the co-location area of the exchange. BT provides a fibre intra-building circuit for the provider to plug into its equipment. This is used to provide an Ethernet circuit to connect the telecoms provider’s equipment to IPEX.
- **Direct access at a neutral access point:** BT also provides interconnection at the Telehouse data centre in London. The telecoms provider builds its own network to the data centre. The POC is the NTE of BT’s IPEX equipment located in the data centre. The telecoms provider provides an intra-building fibre circuit for BT to plug into its equipment. This is used to provide an Ethernet circuit to connect the telecoms provider’s equipment to IPEX.
- **Indirect access via the internet:** telecoms providers can also interconnect via internet peering or via an internet peering partner.

7.25 Figure 7.6 below illustrates the direct access configurations.

²⁷⁹ VICs were agreed through commercial negotiations between BT and telecoms providers without intervention from Ofcom, even though they involve charges referenced to regulated services (i.e. IECs).

- 7.26 For number blocks residing on its IP network, BT currently provides WCT at all the direct access POCs and via indirect access.
- 7.27 In contrast to BT’s TDM interconnect charges which are set primarily on a per-circuit basis, BT’s IP interconnect charges are set primarily on a port capacity basis. A port is the capability to make a call. Thus, a telecoms provider renting a port capacity of 100 ports has the capability to deliver 100 simultaneous calls to BT for WCT.

Figure 7.6: Direct access architecture



Source: Ofcom.

Regulation imposed in the 2017 Narrowband Market Review

BT

- 7.28 In the 2017 Narrowband Market Review Statement (2017 NMR Statement) we found that BT had SMP in the provision of WCT and WCO in the UK excluding the Hull Area.²⁸⁰ We concluded that BT was able to exercise the SMP it holds in relation to WCT and WCO through the pricing and/or provision of interconnection to these services since:
- BT’s SMP in WCO would allow it to discriminate against competing providers seeking interconnection to this service.
 - BT has a large customer base served by a very widely distributed set of terminating nodes. This means that providers interconnecting with BT for WCO and WCT services need to connect to more than 600 DLEs.

²⁸⁰ Ofcom, 2017. *Narrowband Market Review: Statement*, paragraphs 17.109 and 18.44

7.29 As a result, we decided that the interconnect circuits required to reach the terminating (and originating) nodes on the BT network should be regulated.²⁸¹ We imposed a set of remedies on BT’s provision of TDM interconnect circuits as listed in Figure 7.7.

Figure 7.7: Remedies applied to BT’s provision of TDM interconnect circuits in the 2017 Narrowband Market Review²⁸²

Remedies applicable to BT’s provision of CSI, ISI, IEC, IBC and path protection
Provide network access on reasonable request, on fair and reasonable terms, conditions and charges (except where the interconnect services basket (ISB) charge control is applicable)
Requirement not to discriminate unduly
Requirement to publish a reference offer
Requirement to notify charges
Accounting separation
Cost accounting
Transparency as to quality of service
Charge control on the interconnect services basket (ISB) of TDM interconnect circuits provided at the DLE (CSI, ISI, IEC and IBC circuits) using a LRIC+ cost standard comprising of: ²⁸³ <ul style="list-style-type: none"> • A cap on the interconnect services basket at CPI+0% annual change in the basket price;²⁸⁴ and • Sub caps on individual ISB services at +10% on top of the ISB cap (i.e. CPI+10%)²⁸⁵

Source: Ofcom.

7.30 We decided not to regulate interconnection to BT’s fixed voice IP networks in the 2017 Narrowband Market Review because we did not expect BT to undertake significant migration to IP during the market review period, and because we considered that the availability of TDM interconnect circuits would exert a degree of constraint on BT’s commercial arrangements to use IP to deliver traffic to DLEs.²⁸⁶

²⁸¹ Ofcom, 2017. 2017 NMR Statement, paragraphs 17.109-17.111.

²⁸² Ofcom, 2017. 2017 NMR Statement, Sections 17, 18 and 19.

²⁸³ We decided that a charge control was required for BT’s TDM interconnect circuits because the topology and scale of BT’s TDM network meant that telecoms providers needed to purchase more (and different) interconnect circuits from BT as compared to other telecoms providers.

²⁸⁴ Given the relatively small external revenue from interconnect circuits at BT’s DLEs and the falling volumes, we considered that it would not be proportionate to build a detailed cost model to set charges for interconnect services. We considered that keeping charges flat in real terms would best meet our objective to maintain a stable regulatory environment and not deny BT the opportunity to recover its efficiently incurred costs of providing TDM interconnect.

²⁸⁵ We did this as it would provide a safeguard to customers from large price increases (in real terms) and mitigate the risk of BT gaming the basket control, while providing pricing flexibility to BT.

²⁸⁶ Ofcom, 2017. 2017 NMR Statement, paragraphs 17.86 to 17.91 and footnote 771.

Providers other than BT

7.31 While we recognised that providers other than BT had SMP in WCT, we did not impose specific regulation on their interconnection circuits (with the exception of KCOM).²⁸⁷ We said that a competitive distortion requiring further *ex ante* intervention was less likely to arise in the provision of interconnection where providers were of a similar size and subject to the same regulatory obligations.²⁸⁸

Approach to remedies for BT

Our proposals

7.32 In our August 2020 Consultation we proposed to regulate the provision of interconnection, accommodation and related services by telecoms providers. We proposed that all telecoms providers should be required to provide such services on fair and reasonable terms, conditions and charges.

7.33 We also proposed that BT's provision of such services should be subject to additional remedies which in broad terms would:

- maintain the current package of remedies which applies to BT's provision of TDM interconnection, including a charge control;
- apply a broadly comparable package of remedies to BT's provision of IP interconnection, with a lighter touch approach to pricing remedies; and
- apply additional transparency measures in relation to BT's IP interconnection migration, to address the competition concerns that may arise because of the transition from TDM to IP.

Stakeholder responses

7.34 Many respondents commented on our broad package of remedies for BT rather than our specific proposals. The FCS²⁸⁹, Magrathea²⁹⁰, Simwood²⁹¹, TalkTalk²⁹², Telecom2²⁹³, Vodafone²⁹⁴ and Virgin Media²⁹⁵ broadly supported our proposal to maintain the current package of remedies for BT's TDM interconnection services and to apply a broadly comparable package to BT's IP interconnection services. A telecoms provider, Name

²⁸⁷ In the 2017 NMR Statement we also imposed interconnection remedies on KCOM in the Hull area, due to its SMP in WCO.

²⁸⁸ Ofcom, 2017. 2017 NMR Statement, paragraphs 17.114-17.115.

²⁸⁹ The [FCS](#) response to the August 2020 Consultation, page 4.

²⁹⁰ [Magrathea](#) response to the August 2020 Consultation, page 4.

²⁹¹ [Simwood](#) response to the August 2020 Consultation, page 10.

²⁹² [TalkTalk](#) response to the August 2020 Consultation, page 6, paragraphs 6.1 to 6.5.

²⁹³ [Telecom2](#) response to the August 2020 Consultation, pages 5-6.

²⁹⁴ [Vodafone](#) response to the August 2020 Consultation, pages 29-30.

²⁹⁵ [Virgin Media](#) response to the August 2020 Consultation, page 3.

Withheld-2²⁹⁶, also supported our proposal to regulate BT's TDM interconnection services. A telecoms provider, [redacted], [redacted].²⁹⁷

- 7.35 BT supported our proposal that its TDM interconnection services should be subject to a charge control. It requested that the entire set of remedies applicable to the TDM interconnection should be disapplied after WCT has been made available at an IP POC.²⁹⁸
- 7.36 BT said that our proposal to apply the network access and non-discrimination obligations to its IP interconnection services was unjustified, unnecessary and disproportionate because:
- BT is subject to General Condition A1 (Obligation to negotiate interconnection) and the End-to-End Connectivity Condition which in practice restrict its ability to negotiate charges for interconnection.
 - Ofcom's analysis suggested that the scope for harm is reduced because IP interconnection is simpler and cheaper than TDM interconnection.
 - BT expected a material improvement in competition over the review period because services replacing WLR would be supplied by a range of telecoms providers, and because the transition to IP interconnection would reduce the barriers to direct interconnection.
 - Ofcom had not substantiated its argument that BT's high share of WCT volumes and importance as an interconnect partner for other fixed providers means that the impact of discriminatory conduct by BT would have a greater effect on downstream competition than similar conduct by other telecoms providers.²⁹⁹

Our reasoning and decisions

- 7.37 As we have discussed in Section 6, our competition concern about BT's SMP in the provision of WCT is that it would have the ability and incentive to provide access subject to unfair or unreasonable terms or refuse access to its network and to discriminate between telecoms providers in a way that harms competition. Moreover, BT's high share of WCT volumes and importance as a partner for other fixed providers means that the impact of discriminatory conduct by BT would have a greater impact on the effectiveness of the WCT remedies than similar conduct undertaken by other telecoms providers.
- 7.38 We believe that the same competition concern applies where telecoms providers require interconnection, accommodation and related services in order to obtain WCT from BT. Absent regulation, there is a risk in the forthcoming market review period that BT could leverage its SMP in the provision of WCT into the provision of interconnection, accommodation and related services, thereby undermining the effectiveness of the WCT remedies.

²⁹⁶ [Name Withheld-2](#) [redacted] response to the August 2020 Consultation, page 1.

²⁹⁷ [redacted]

²⁹⁸ [BT](#) response to the August 2020 Consultation, page 20.

²⁹⁹ [BT](#) response to the August 2020 Consultation, pages 18, 20 and 21.

- 7.39 We recognise that two of the factors that led us to impose regulations on BT's TDM interconnection in the 2017 Narrowband Market Review will change during this market review period as a result of BT's plans to withdraw its TDM network.
- 7.40 First, telecoms providers will migrate end-users from WLR-based services to replacement services in preparation for the withdrawal of WLR in 2025. As set out in Section 4, when this process is complete, telecoms providers will no longer require TDM interconnection from BT to obtain WCO.
- 7.41 Second, once BT has migrated the POCs for all its number blocks from its DLEs to its IP network, telecoms providers will require IP interconnection rather than TDM interconnection to obtain WCT. As discussed above, BT's IP network has far fewer points of interconnection than its TDM network, of which only a subset would typically be used to interconnect with another large network. As a result, IP interconnection is likely to be more straightforward, and costs are likely to be significantly lower, than for TDM, and the scope for BT to leverage its SMP in WCT into interconnection may reduce somewhat by the end of the market review period.
- 7.42 However, these changes will have not fully played out until towards the end of the market review period. Telecoms providers will continue to require TDM interconnection to obtain WCT for those number blocks residing on BT's TDM network. As we discuss later, BT's draft plan is to migrate the number blocks from its TDM network to its IP network over a 12-18 month period starting in early 2023. Consequently, telecoms providers will continue to rely on TDM interconnection for a significant extent for much of the market review period.
- 7.43 In addition, the extent to which IP interconnection may strengthen competition in transit and reduce BT's importance as an interconnect partner for other fixed providers is uncertain. IP interconnection may reduce the barrier to interconnection between networks (because it is cheaper and simpler) but other barriers remain, such as the administrative cost of negotiating interconnection, and these barriers mitigate against the potential increase in interconnections between networks, except on very high traffic routes.
- 7.44 If the risk that BT may be able to leverage its SMP in WCT into interconnection were to be realised, there would also be significant scope for harm. As discussed in section 6, BT is the largest provider of WCT accounting for more than half of all WCT. Consequently, the impact of discriminatory conduct by BT would have a greater downstream impact on the effectiveness of the WCT remedies than similar conduct undertaken by other telecoms providers.
- 7.45 As we discuss in more detail below, there is also a risk that uncertainty about BT's migration plans or unexpected changes to those plans could also frustrate competition.
- 7.46 We do not consider that General Condition A1 or the End-to-End Connectivity Condition would adequately mitigate these risks as BT has suggested. General Condition A1.2 requires a provider of a public electronic communications network (PECN) to negotiate with another provider of a PECN, to the extent requested, with a view to concluding an

agreement for interconnection within a reasonable period.³⁰⁰ It does not, however, impose any obligations relating to the terms of such agreements. The End-to-End Connectivity Condition places certain obligations on BT concerning the purchase of WCT from other telecoms providers.³⁰¹ It does not, however, impose any obligations on BT's provision of WCT, interconnection, accommodation and related services in support of the provision of WCT by BT.

7.47 To effectively address our competition concerns we have decided to implement our consultation proposals (except for some minor changes) and regulate BT's provision of interconnection, accommodation and related services.

7.48 We set out the remedies we are imposing, and respondents' detailed comments about those remedies in four subsections below:

- non-pricing remedies specific to BT;
- pricing remedies specific to BT;
- migration remedies specific to BT; and
- other points related to interconnection provided by BT.

Non-pricing remedies specific to BT

Our proposals

7.49 In our August 2020 Consultation, we proposed to maintain existing non-pricing remedies on BT for the provision of TDM interconnection and extend those to IP interconnection. In summary we therefore proposed to impose the following non-pricing remedies specifically on BT:

- To specify that the requirement to provide network access on reasonable request applies to IP and TDM interconnection and associated services such as accommodation.
- A requirement not to unduly discriminate applying both to IP and TDM interconnection.
- Transparency requirements applying both to IP and TDM interconnection, specifically the publication of a reference offer setting out fair and reasonable terms and conditions, a requirement to notify changes to charges, and transparency as to quality of service.

Stakeholder responses

7.50 As noted above, many respondents broadly supported the package of remedies we proposed for BT, rather than or instead of commenting our detailed proposals.

³⁰⁰ Ofcom, *Unofficial consolidated version of General Conditions of Entitlement* as at 24 March 2021.

³⁰¹ Ofcom 2006. [End to End Connectivity Statement](#) [Accessed 25 March 2021]

- 7.51 The FCS³⁰², Magrathea³⁰³, TalkTalk³⁰⁴, Telecom2³⁰⁵, and Vodafone³⁰⁶ responded to our request for further information about the scope for unduly discriminatory conduct by BT and about the need for proposed non-discrimination obligation, all supporting its application to BT's provision of interconnection and accommodation.
- Vodafone considered that BT has a strong incentive to provide network access on terms which disadvantage downstream rivals or discriminate selectively between competing providers because of its vertical integration and importance as an interconnect partner for other telecoms providers.³⁰⁷
 - Similarly, Telecom2 noted that BT's central role in the provision of voice services mean that its activities can have wide ranging effects on other telecoms providers. It said that the non-discrimination obligation would prevent BT from favouring one CP when allocating and providing interconnect capacity.³⁰⁸
 - Magrathea considered a non-discrimination obligation to be essential and that their experience of BT cherry picking the most profitable interconnect business provided further justification.³⁰⁹
 - The FCS noted that a member has submitted a complaint to Ofcom alleging that certain charges for BT's IPEX service are in breach of non-discrimination obligations.³¹⁰
- 7.52 BT asked us to consider whether the new KPIs we had proposed for its IP interconnect circuits would be proportionate given that significant work would be required to implement the measures. It also noted that IP interconnect circuits are generally used to carry multiple traffic streams and that WCT traffic is not generally carried on dedicated IP interconnect circuits.³¹¹

Our reasoning and decisions

Requirement to provide network access on reasonable request

- 7.53 To address our competition concerns associated with BT's market power in WCT, we have decided to require BT to provide network access on reasonable request for associated facilities as are reasonably necessary for the provision of WCT, where such services include interconnection and accommodation. The obligation will apply generally to the provision of network access and will therefore encompass TDM interconnection for number blocks where the POC for WCT is at a BT DLE, and IP interconnection where the POC for WCT is on BT's IP network.

³⁰² The FCS response to the August 2020 Consultation, response to Q7.1

³⁰³ Telecom2 response to the August 2020 Consultation, response to questions 6.1 and 7.1

³⁰⁴ TalkTalk response to the August 2020 Consultation, paragraph 3.7.

³⁰⁵ Telecom2 response to the August 2020 Consultation, response to questions 6.1 and 7.1

³⁰⁶ Vodafone response to the August 2020 Consultation, pages 28-30.

³⁰⁷ Vodafone response to the August 2020 Consultation, pages 28-30.

³⁰⁸ Telecom2 response to the August 2020 Consultation, response to questions 6.1 and 7.1

³⁰⁹ Magrathea response to the August 2020 Consultation, response to Q7.1

³¹⁰ The FCS response to the August 2020 Consultation, response to Q7.1

³¹¹ BT response to the August 2020 Consultation, page 19.

- 7.54 The network access condition for WCT requires BT to provide network access on fair and reasonable terms and conditions and charges, except where a charge control is in place. We set out our decision to set a charge control for BT's TDM interconnect circuits below. We also set out our guidance as to how the obligation to have fair and reasonable charges should apply to BT's IP interconnection services.
- 7.55 As set out above, this remedy is necessary in relation to both TDM and IP interconnection as BT could have an incentive not to provide interconnection and accommodation on a fair and reasonable basis,³¹² which would reduce the effectiveness of the remedies that we are applying to BT for WCT.
- 7.56 The ability of competing telecoms providers to request, and be provided with, interconnection services will facilitate competition in downstream markets by allowing other providers to offer competing end-to-end fixed voice services.

Withdrawal of TDM regulation

- 7.57 With regards to BT's comments about the disapplication of regulation after migration, we note that once migration of number blocks at a DLE has occurred, interconnection at the relevant TDM POC is no longer necessary in order to purchase termination for the migrated numbers. Consequently, the service is no longer part of the network access required by Condition 1 of the SMP Conditions since it no longer an associated facility. BT's network access obligations therefore will no longer apply to its interconnection services at that TDM POC. The TDM interconnection remedies will fall away entirely once all number blocks have been migrated to an IP POC or 1 April 2025, whichever is earlier.

Requirement not to unduly discriminate

- 7.58 We have decided to impose a condition requiring BT not to discriminate unduly in the provision of interconnection and accommodation.
- 7.59 As a vertically integrated provider, BT may have the incentive to provide network access on terms that disadvantage downstream rivals or to discriminate selectively between competing providers. The no undue discrimination obligation is intended to prevent such conduct in relation to the provision of interconnection and accommodation services which could undermine the effectiveness of the WCT remedies.
- 7.60 As noted above, respondents other than BT agreed with that concern. They believed that, absent a non-discrimination obligation, BT would have an incentive to impose terms which would disadvantage downstream rivals or discriminate selectively between competing providers
- 7.61 We recognise that the scope for discriminatory conduct may be mitigated to a significant extent by the package of remedies we are implementing for interconnection and

³¹² Unfair/unreasonable terms could relate to almost any aspect of the provision and maintenance of interconnection, including but not limited to for example: excessive prices, unreasonably long lead times for new circuits or poor fault repair timescales.

accommodation services.³¹³ For example, unduly discriminatory terms and conditions would likely be inconsistent with the obligation to provide network access on fair and reasonable terms and conditions. Also, as IP interconnection is also significantly simpler and less costly than TDM interconnection, the overall scope for harm may reduce over the market review period.

- 7.62 However, the network access obligation would not completely eliminate the scope for unduly discriminatory conduct. Absent a non-discrimination obligation, BT would have greater flexibility to impose differential terms for interconnection and accommodation on competing providers. While terms may not be unfair or unreasonable for the purposes of an individual agreement, differential treatment of providers could place some at such a disadvantage that such terms are unduly discriminatory, thereby undermining the effectiveness of the WCT remedies.
- 7.63 As noted above, BT's importance as an interconnect partner for other telecoms providers will continue to mean that the impact of any discriminatory conduct by BT would have a greater impact on the effectiveness of the WCT remedies than similar conduct undertaken by other telecoms providers. Since BT's transition to IP interconnection will not be completed until 2025, any resultant reduction in the scope for harm will not be fully realised until towards the end of this market review period.

Transparency requirements

- 7.64 The requirements for the transparency of charges, terms and conditions are complementary remedies to ensure that telecoms providers are able to make effective use of BT's network access.
- 7.65 We have decided to require BT to publish a Reference Offer, to notify changes to charges, and to provide transparency as to the quality of interconnection services. These transparency requirements replicate current remedies for TDM interconnection and impose a new requirement for BT to publish a reference offer for IP interconnection and associated services.

Publish a Reference Offer

- 7.66 We have decided that BT will be required to publish a Reference Offer for its provision of interconnection and accommodation. This gives certainty about the terms and conditions on which providers can purchase wholesale access services and, by enhancing transparency, reduces the risk of potential anti-competitive behaviour. The publication of a Reference Offer gives confidence to those purchasing wholesale services that they are being provided on non-discriminatory terms, helps to ensure stability in markets, and ensures that incentives to invest are not undermined.
- 7.67 We consider it appropriate for the published Reference Offer to include:

³¹³ As we discuss in more detail later in this section, these include: an obligation to provide network access on fair and reasonable terms, conditions, and charges (except where a charge control applies); a charge control on TDM interconnection circuit charges; and an obligation to publish a reference offer.

- A clear description of the services on offer.
- Terms and conditions including charges and ordering, provisioning, billing and dispute resolution procedures. The Reference Offer should provide sufficient information to enable providers to make technical and commercial judgements such that there is no material adverse effect on competition.
- Conditions relating to maintenance and quality (service level agreements and guarantees). The inclusion of service levels, as part of the contractual terms of the Reference Offer, that provides for a minimum acceptable level of service, should ensure that services are provided in a fair, reasonable, timely and non-discriminatory fashion.
- Information relating to technical interfaces and points of interconnection. Such information should ensure that providers are able to make full and effective use of all the services provided.
- Terms and conditions on which BT supplies its services.

Requirement to notify changes to charges

- 7.68 We have decided that it is appropriate for BT to be subject to an obligation to notify (by means of a published notice) changes to charges for the provision of interconnection and accommodation. We have decided to maintain the current 56-day notice period.
- 7.69 The advance notice of changes to charges at the wholesale level will assist transparency for competing providers who purchase wholesale access services. Advance notice of changes to charges will therefore help to ensure stability in markets, without which incentives to invest might be undermined and market entry made less likely, resulting in a detrimental effect on downstream competition.
- 7.70 We consider that the notice should include:
- a description of the access service;
 - the location of terms and conditions in the Reference Offer;
 - the effective date or period from which the changes will have effect; and
 - the current and proposed charges.

Transparency as to quality of service

- 7.71 We have decided that BT should be required to provide transparency as to the quality of service (QoS) for its provision of interconnect circuits by publishing KPIs relating to the provision of TDM interconnect circuits and IP interconnect circuits.
- 7.72 We consider that service provision and fault repair are critical areas in which to maintain transparency of BT's service levels. These areas remain key to monitoring the effectiveness of the proposed network access and no undue discrimination remedies by requiring the publication of data regarding the delivery of wholesale services by BT to other third-party telecoms providers. Absent transparency as to quality of service in relation to interconnect circuits, BT may seek to gain competitive advantage in downstream markets by undermining the effectiveness of the WCT remedies through extended provisioning or fault repair times for telecoms providers that compete with it in these downstream markets.

- 7.73 We have decided that BT should continue to publish data on specified KPIs in relation to the provision of TDM interconnect circuits to all telecoms providers (as an aggregate figure). Those KPIs are as follows:
- a) Percentage of Completed Orders that were completed by the Contract Delivery Date during the Reporting Period.
 - b) Average time (in hours) during the Reporting Period for BT to achieve Restored Service after a fault has been registered.
 - c) Total number of Committed Orders that became Completed Orders during the Reporting Period.
 - d) Number of faults where BT subsequently achieves Restored Service during the Reporting Period.
 - e) Percentage of Data Management Amendments for new numbers that become Completed Orders during the Reporting Period.
 - f) Total number of Data Management Amendments for new number ranges that became Completed Orders during the Reporting Period.³¹⁴
- 7.74 We have also decided that BT should be required to publish data on KPIs in relation to the provision of IP interconnection. This is because, during this review period, IP interconnect circuits will become the main type of interconnect circuit purchased by telecoms providers to access WCT. We consider this is a proportionate intervention given the risk, and potential for harm that may occur, of BT seeking to gain competitive advantage in downstream markets through extended provisioning or fault repair times for telecoms providers that compete with it in these downstream markets.
- 7.75 We consider that the KPIs should be broadly comparable to those for TDM interconnection, encompassing provisioning, repair, and Data Management Amendments.
- 7.76 We have decided to make a small change to our proposals in our August 2020 Consultation in relation to the KPIs required for circuit provisioning. In relation to provisioning of IP interconnect, BT has told us that circuit provisioning volumes are likely to be low because many telecoms providers already have IP interconnect with BT and because individual circuits have very high capacity. Consequently, orders for port capacity are likely to be the main focus of IP interconnect provisioning.³¹⁵ We have therefore decided to withdraw the proposed transparency KPIs for IP interconnect circuits orders and to retain the KPI for port capacity orders. If in future there are concerns about circuit provisioning performance, we may reconsider the case for a KPI obligation in relation to IP interconnect circuits.
- 7.77 Therefore, BT is required to publish data on the following KPIs in relation to the provision of IP interconnection to all telecoms providers (as an aggregate figure):

³¹⁴ These measures are specified in the Direction under SMP Condition 6 as set out in Annex 5.

³¹⁵ Note of meeting between Ofcom and BT held on 22 January 2021.

- a) Percentage of Completed Orders for port capacity that were completed by the Contract Delivery Date during the Reporting Period.
- b) Average time (in hours) during the Reporting Period for BT to achieve Restored Service after a fault has been registered.
- c) Total number of Completed Orders for port capacity that were completed by the Contract Delivery Date during the Reporting Period.
- d) Number of faults where BT subsequently achieves Restored Service during the Reporting Period.
- e) Percentage of Data Management Amendments for new numbers that become Completed Orders during the Reporting Period.
- f) Total number of Data Management Amendments for new number ranges that became Completed Orders during the Reporting Period.

Regulatory financial reporting requirements

- 7.78 These requirements include accounting separation and cost accounting obligations. We cover these decisions in Section 8.

Implementation matters

Accommodation, electricity and Cablelink

- 7.79 We remain of the view that in accordance with the network access obligation, BT should provide accommodation and related services on regulated terms in connection with the provision of WCT and without any requirement to purchase additional circuits from Openreach or others.
- 7.80 BT highlighted that accommodation and related services are available from Openreach in connection with the provision of wholesale Ethernet services and also from other telecoms providers with a presence at BT's POCs. BT believed that there was no need for BT Enterprise to modify its current portfolio or develop an ad-hoc co-location product just for IPEX.³¹⁶
- 7.81 We recognise that some telecoms providers may already have accommodation at BT's POCs, or wish to purchase wholesale Ethernet circuits from Openreach or others, but there may be others that will need accommodation (but not additional Ethernet circuits) in order to access WCT. This is especially the case if the number of direct interconnections at BT's POCs increases with the move to IP interconnection. Absent regulation, there is a risk that BT could leverage its SMP into the provision of those accommodation services.
- 7.82 It is for BT to decide how it will supply accommodation and related services for IP interconnection. An efficient solution may be for BT to make Openreach's accommodation and related services available for IP interconnection.

³¹⁶ BT response to the August 2020 Consultation, page 22.

Implementation timescales

- 7.83 BT will need to amend its reference offer for IP interconnection to reflect the remedies we are imposing. Amongst other things, it will need to describe how it will make accommodation available for IP interconnection as discussed above. It will also need to develop the transparency KPIs for IP interconnection.
- 7.84 To give BT time to undertake these activities, we have decided that the requirement to publish a reference offer for IP interconnection should apply from 1 October 2021 and the requirement to publish KPIs for IP interconnection should also apply from 1 October 2021.
- 7.85 For the avoidance of doubt, the obligation to give a 56-day notification of changes to charges applies from 1 April 2021.

Pricing remedies specific to BT

- 7.86 We have decided to implement a charge control on TDM interconnection circuits provided by BT. We have decided that BT's IP interconnection and associated accommodation services will be subject to a fair and reasonable charges obligation supplemented by guidance.

TDM interconnection

Our proposals

- 7.87 In our August 2020 Consultation we proposed to maintain the existing charge control in relation to BT's provision of TDM interconnect circuits at the DLE. Specifically, we proposed:
- a cap on the interconnect services basket (ISB)³¹⁷ at CPI+0% annual change in the basket average price; and
 - sub-caps on individual ISB services at +10% on top of the ISB cap (i.e. CPI+10%).
- 7.88 We proposed that BT provide us with compliance spreadsheets by June each year accompanied by a statement from an independent third-party providing assurance over the spreadsheets.
- 7.89 We also proposed that the charge control should apply from 1 April 2021 until 1 April 2025 or one month after the WCT has been made available at a nominated IP POC, whichever is earlier.

³¹⁷ The ISB includes three types of interconnect circuits that BT provides: ISI, IEC and CSI, plus IBCs which are required for any form of TDM interconnect. See discussion above for further details. The full list of individual services in the ISB is included in the Annex to Condition 3C, as set out in Annex 5 of this Statement.

Stakeholder responses

- 7.90 BT³¹⁸, The FCS³¹⁹, Magrathea³²⁰, TalkTalk³²¹, Telecom2³²² and Vodafone³²³ supported our proposal that BT's provision of TDM interconnect circuits should be subject to a charge control. Another telecom provider, Name Withheld-2, supported our proposal to continue regulation of BT's TDM interconnection until 2025.³²⁴
- 7.91 Telecom2³²⁵ and Vodafone³²⁶ were concerned that BT's migration programme might take longer than anticipated. They therefore considered that the charge control should be maintained until the programme is completed rather than have a fixed expiry date.
- 7.92 UKCTA raised concerns about the proposed design of the TDM interconnect charge control. UKCTA argued that the baskets were very large and that this, combined with sub-basket caps of CPI+10%, allows undue flexibility to BT to favour its own downstream operations.³²⁷

Our reasoning and decisions

- 7.93 Given the risk of excessive charges in relation to the provision of interconnection by BT, as identified above, we have decided that a charge control for TDM interconnect circuits provided by BT is appropriate.
- 7.94 We do not consider that a requirement for fair and reasonable charges without a charge control would be a sufficient constraint on BT's pricing or provide sufficient certainty over the pricing of BT's TDM interconnect circuits.
- 7.95 Providers will continue to be reliant on TDM interconnect circuits in order to terminate calls until the regulated FTR for WCT becomes available via IP interconnection. Moreover, providers will need to purchase more (and different) interconnect circuits from BT as compared to other telecoms providers owing to the topology and scale of BT's TDM network. Requiring interconnect circuit charges to be fair and reasonable, without further pricing obligations, could allow BT to set charges at such a level that would restrict downstream competition and inhibit the effectiveness of the SMP remedies for the WCT market.
- 7.96 A charge control can help ensure that telecoms providers who buy WCT from BT, and ultimately customers, are not harmed by an increase in prices, incentivise cost efficiency on the part of the dominant provider, and provide greater certainty for customers in relation to the maximum charges they are likely to face (at least on average when charges are controlled in a basket).

³¹⁸ BT response to the August 2020 Consultation, page 20.

³¹⁹ The FCS response to the August 2020 Consultation, page 5.

³²⁰ Magrathea response to the August 2020 Consultation, page 5.

³²¹ TalkTalk response to the August 2020 Consultation, page 9, paragraph 6.18.

³²² Telecom2 response to the August 2020 Consultation, response to Q7.4.

³²³ Vodafone response to the August 2020 Consultation, page 31.

³²⁴ Name Withheld-2 [redacted] response to the August 2020 Consultation, page 1.

³²⁵ Telecom2 response to the August 2020 Consultation, page 6.

³²⁶ Vodafone response to the August 2020 Consultation, page 31

³²⁷ [UKCTA](#) response to the August 2020 Consultation, paragraph 14.

- 7.97 All respondents, including BT, agreed that a charge control was needed for TDM interconnection.
- 7.98 We have decided that the charge control is needed as a safeguard until 1 April 2025. As discussed above, from 1 April 2025, BT must make WCT available for all its geographic numbers at the regulated FTR at IP POCs (whether or not migration is complete) and hence providers should no longer require TDM interconnection with BT for WCT. We therefore do not agree with the view expressed by Telecom2 and Vodafone that the TDM charge control should be maintained until the programme is completed rather than have a fixed expiry date.
- 7.99 We have decided to retain the TDM charge control at its current level in real terms (i.e. CPI+0%). Given the relatively small value of BT's external TDM interconnection revenue,³²⁸ and the fact that this is a temporary safeguard, we think that it would not be proportionate to build a detailed cost model to set charges for TDM interconnect services. Stable prices will also avoid price changes that could disrupt or distort the migration plans of providers.

Other charge control details

- 7.100 Since we have decided to maintain the charge control at its current level in real terms, we have also decided to maintain the design of the charge control, with the exception of the duration which we have adjusted to reflect the migration timetable for number blocks from BT's TDM network to its IP network. We have therefore decided:
- **Duration:** the charge control applies to interconnection at each DLE from 1 April 2021 until the earlier of (i) one month from the date when the migration of number blocks at that DLE to an IP POC is completed; and (ii) 1 April 2025.
 - **Sub-caps:** to continue with current regulation on sub-caps for the ISB, i.e. 10% on each individual ISB service on top of the ISB cap.³²⁹
 - **Prior year revenue weights:** to use prior financial year revenue weights when testing compliance with the charge control on interconnect circuits.
 - **External charges and revenues:** to use external revenues only for the ISB charge control as the prior year weighting within the charge control formula.
 - **Multiple price changes during a year:** to use the same general formula for the ISB charge control as was used in the 2017 NMR. The approach will:
 - weight all service charges to reflect the proportion of the year during which they were in effect; and

³²⁸ BT's external revenue for DLE Interconnect Circuits was £5m for the year ended 31 March 2020, and £6m for the year ended 31 March 2019 (see [BT Regulatory Financial Statements](#) 2020, pages 25 and 26 [accessed 24 March 2021]).

³²⁹ This replicates the control currently in place. In response to UKCTA's view that this approach allows undue flexibility to BT to favour its own downstream operations; we see no justification for a tighter control given the likely decline and prospective withdrawal of TDM interconnection over the forthcoming market review period. We also note that BT did not increase the charge for any individual service in the ISB by 10% in either 2018/19 or 2019/20. BT publishes spreadsheets demonstrating how its charges comply with the TDM interconnection basket and sub-cap controls on [its website](#). [Accessed 10 February 2021]

- evaluate charge changes for each service in relation to the weighted average charge that applied during the prior year for that service, rather than based on the charge on the last day of the prior control year.
- **Deficiency and excess provisions:** to continue using the existing deficiency and excess provisions for the ISB charge control³³⁰, and to continue requiring BT to make repayments to other affected telecoms providers (as soon as is reasonably practicable), in the event that it charges in excess of the cap in any given year for ISB services.
- **Rounding:** that interconnect circuit charges should be rounded to the nearest penny for measuring compliance with the ISB charge control.
- Compliance:
 - to require BT to submit spreadsheets to Ofcom each year demonstrating compliance with the basket control on TDM interconnection.³³¹
 - to require BT to publish non-confidential versions of these compliance spreadsheets on its website consistent with current practice.³³²

IP interconnection

Our proposals

7.101 In our August 2020 Consultation we proposed that BT's IP interconnection and associated accommodation services should be subject to a fair and reasonable charges obligation supplemented by guidance.

Stakeholder responses

7.102 The FCS³³³, Magrathea³³⁴, TalkTalk³³⁵, Telecom2³³⁶ and Vodafone³³⁷ supported our proposal to apply pricing remedies to BT's IP interconnections services but had differing views about what remedies would be appropriate:

³³⁰ These provisions have two functions: where BT charges below the cap, it gives the ability to use the 'deficiency' created by setting charges below the cap within the prevailing year towards compliance in the following year; and where BT charges in excess of the cap, it is required to make the excess up the following year by charging less than the cap would otherwise have allowed.

³³¹ These must be accompanied by a statement from an independent third party (e.g. the auditor of the RFS) confirming the data in the spreadsheets (e.g. pricing, volume and revenue inputs) have been properly extracted from BT's systems and that the calculations are in accordance with the SMP conditions. This assurance will be in the form of agreed upon procedures. This statement will provide assurance that the numbers BT is relying on to demonstrate compliance have been correctly extracted from its systems, save us time in checking BT's data and will help ensure that BT is meeting its obligations under the charge control. This is consistent with compliance requirements imposed in the WFTMR 2021 Statement. This information must be provided by August each year. This is a little later than our June proposal for consistency with the WFTMR 2021 Statement (see volume 4 of that statement) and will ensure we receive all compliance information at the same time, along with assurance statements as applicable.

³³² This was previously a requirement under the regulatory financial reporting condition, but we have decided to move this requirement to the charge control condition.

³³³ The FCS Response to the August 2020 Consultation, page 5.

³³⁴ Magrathea Response to the August 2020 Consultation, pages 5-6.

³³⁵ TalkTalk response to the August 2020 Consultation, page 9, paragraph 6.19.

³³⁶ Telecom2 response to the August 2020 Consultation, response to Q 7.5.

³³⁷ Vodafone response to the August 2020 Consultation, page 32

- Telecom2 argued that the proposed fair and reasonable charges obligation, supplemented by guidance, would not be sufficient to constrain BT's prices. It therefore favoured the imposition of a charge control.³³⁸
- Vodafone said that Ofcom should provide further guidance about the cost standard which should be applied when determining whether charges are reasonably derived from the cost of provision. It was concerned that absent further guidance, BT would take the most favourable interpretation of the obligations and uncertainty would damage competition.³³⁹
- TalkTalk said that it could not foresee circumstances in which BT would bear greater costs for set-up and interconnection than other providers. It therefore suggested that our guidance on fair and reasonable charges should be amended to specify that BT and interconnecting telecoms providers should each bear their own costs, without exchange of charges, for set-up and interoperability testing. It also suggested that the guidance should be applied to port charges.³⁴⁰
- The FCS supported our proposals and suggested that interconnection charges should be limited or that telecoms providers should bear their own costs to ensure effective competition and speedy rollout of IP interconnection.³⁴¹
- Magrathea agreed with our proposed guidance.³⁴²

7.103 As previously noted, BT objected to our proposal that the obligation to provide access on fair and reasonable terms, conditions and charges should apply to BT's IP interconnection and other associated facilities. BT also noted that would not be possible to differentiate between transit and WCT traffic flowing through interconnect ports. BT argued that, consequently, regulation of BT's port charges would introduce technical complexity and would force it to apply an inefficient solution. BT therefore suggested that we should consider alternative approaches such as regulating its port services based on the proportion of WCT traffic they carry.³⁴³

Our reasoning and decisions

7.104 We have decided to impose an obligation for BT to ensure that its charges for IP interconnection are fair and reasonable, supplemented by guidance concerning the interpretation of this obligation for each service.³⁴⁴

7.105 During this market review period, as BT's migration programme progresses, telecoms providers will become increasingly reliant on BT's IP interconnect services and the constraint provided by TDM interconnect will reduce. Absent regulation there is a risk that BT would have the incentive and ability to set excessive charges for the IP interconnection

³³⁸ Telecom2 response to the August 2020 Consultation, response to Q 7.5.

³³⁹ Vodafone response to the August 2020 Consultation, page 32

³⁴⁰ TalkTalk response to the August 2020 Consultation, page 9, paragraph 6.20.

³⁴¹ The FCS Response to the August 2020 Consultation, page 5.

³⁴² Magrathea Response to the August 2020 Consultation, pages 5-6.

³⁴³ BT response to the August 2020 Consultation, page 21.

³⁴⁴ As set out in Annex 5, this obligation is implemented by means of SMP Conditions 1.2. and 1.5. We have made slight adjustments to the wording of SMP Conditions 1.2 and 1.3 to make it clear that network access charges which are not covered by a charge control are subject to a fair and reasonable obligation under SMP Condition 1.2.

and accommodation services that telecoms providers require in order to obtain WCT. As we have discussed above, BT's high share of WCT volumes and importance as a partner for other fixed providers means that the impact of discriminatory conduct by BT would have a greater impact on the effectiveness of the WCT remedies than similar conduct undertaken by other telecoms providers.

- 7.106 We have decided to address the risk of excessive pricing with a fair and reasonable charges obligation supplemented by guidance rather than by way of a more prescriptive charge control. This is because, as set out above, with IP interconnection, the scale of the risk of excessive pricing is somewhat less than with TDM interconnection. BT's IP network has far fewer POCs than its TDM network, and telecoms providers will only need a small number of POCs to interconnect. IP interconnection arrangements between BT and other telecoms providers will therefore be more symmetric than was the case for TDM interconnection.
- 7.107 On the cost standard, in response to Vodafone's comments, we have amended our guidance to clarify how it should be interpreted concerning those of BT's charges which we consider should be cost based, specifically BT's charges for IPEX service set-up and interoperability testing, IPEX interconnect ports at neutral access points and indirect access.
- 7.108 In our August 2020 Consultation we proposed that BT's charges for these services would be deemed fair and reasonable if BT can demonstrate that its charges in aggregate are reasonably derived from the cost of provision based on a forward looking long run incremental cost approach and allowing for an appropriate mark up for the recovery of common costs including an appropriate return on capital employed.
- 7.109 We note however, that where this form of wording has been used in other contexts, such as for cost orientation obligations, it has been interpreted to mean that BT's charges must as a first order test be between distributed long run incremental cost (DLRIC) and distributed standalone cost (DSAC).
- 7.110 We do not think that DSAC is an appropriate benchmark as any efficiency benefits of providing BT with the additional flexibility that DSAC offers (over fully allocated cost (FAC)) are likely to be small, and outweighed by the risk that BT exploits this flexibility to the detriment of telecoms providers purchasing WCT, and ultimately consumers. We therefore amended the guidance to clarify that we would be likely to consider BT's charges to be fair and reasonable if they are consistent with the operating and capital costs of the relevant services, i.e. similar to FAC rather than an alternative cost standard like DSAC.
- 7.111 On IP interconnection circuit costs and port charges, our proposed guidance discussed interconnect circuit charges in the context of BT's port charges, reflecting BT's current charging structure. To provide greater clarity we have amended our guidance so that interconnect circuit charges and port charges are discussed separately.
- 7.112 As BT has noted, IP interconnect circuits are often used to carry multiple traffic streams, typically including WCT and other services (such as transit and conveyance) which BT provides on a commercial basis.

- 7.113 We acknowledge that implementation may present some practical challenges as only WCT (and its associated facilities) falls within the scope of the network access obligation. However, we do not consider the challenges would be insurmountable, or that BT would have to provide WCT and commercial services on separate circuits, which in some cases might be less efficient. For example, BT told us that, if our proposals were confirmed, it would consider adopting a port charging mechanism which ensures that charges for capacity used for WCT are consistent with the pricing obligations for IP interconnection and applies commercial rates for capacity used for other services.³⁴⁵

Guidance about BT's interconnection and accommodation charges

IPEX service set-up and interoperability testing charges

- 7.114 These non-recurring charges are levied by BT when telecoms providers first establish IP interconnection with BT using the IPEX service.
- 7.115 We would expect that in many instances, both parties might incur set-up and interoperability testing costs and both parties would be likely to benefit from interconnection. In such circumstances the parties may choose to bear their own costs without the need for an exchange of charges.
- 7.116 In other circumstances such costs may be borne wholly or predominantly by BT, and so it may be appropriate for BT to make a charge for set-up and interoperability testing. If so, we would expect that any charges would be cost based.
- 7.117 We have therefore decided to provide guidance that BT's charges for these services will be presumed to be fair and reasonable provided it can demonstrate that its charges in aggregate are reasonably derived from the costs of provision based on the forward looking long run incremental cost of provision of the applicable service and allowing an appropriate mark up for the recovery of common costs (e.g. general overheads) including an appropriate return on capital employed (where applicable). We would expect any mark up for common costs such as overheads to be derived from information in the Regulatory financial statements (RFS) to ensure overall costs are similar to FAC.

IPEX interconnect circuit charges (direct access)

- 7.118 Under current arrangements, BT's charges for IP interconnection capacity are in the form of port rental charges rather than interconnect circuit connection and rental charges as is the case for TDM interconnection capacity.
- 7.119 Where interconnection is provided at a BT exchange, we consider that the relevant costs are those relating to the interconnect circuits used to connect telecoms provider's equipment to BT's interconnect nodes. These are intra-building fibre circuits which are closely analogous to Openreach's Internal Cablelink Variant 1 service which provides fibre connectivity between telecoms provider's equipment in different locations within a BT exchange. In the WFTMR 2021 Statement, we have imposed a cost-based charge control

³⁴⁵ Meeting between Ofcom and BT held on 26 January 2021.

(CPI-0%) on Cablelink charges in the Wholesale Local Access (WLA) markets for the next market review period (2021-2026).³⁴⁶

- 7.120 In view of this, we consider that Internal Cablelink Variant 1 is a suitable benchmark against which to assess whether BT's charges are fair and reasonable. We have therefore decided that BT's charges for IP interconnect circuits (if it should choose to introduce such charges in future) will be presumed to be fair and reasonable if, in aggregate, they do not exceed the relevant charge for Internal Cablelink Variant 1 in the WLA markets.

IPEX interconnect port charges (direct access)

- 7.121 Our expectation is that fair and reasonable IP interconnect charges should not make any allowance for the interconnect node costs (as is the case with TDM interconnect circuit charges³⁴⁷) as the price cap we are imposing for WCT incorporates the LRIC of all of the network components associated with interconnect nodes (specifically the session border controller and associated aggregation layer), including interconnect node capacity provided for resilience purposes.³⁴⁸

IPEX interconnect port charges (neutral access points and indirect access)

- 7.122 It is unclear whether interconnection at neutral access points and indirect access gives rise to costs in addition to the interconnect node costs, which as discussed above we consider to be adequately covered by WCT charges. To the extent that there are material additional costs associated with these methods of interconnection, we expect that fair and reasonable charges for such interconnect services will in aggregate be reasonably derived from the costs of provision based on the forward looking long run incremental cost of provision of the applicable service and allowing an appropriate mark up for the recovery of common costs including an appropriate return on capital employed. We would expect any mark up for common costs such as overheads to be derived from information in the RFS to ensure overall costs are similar to FAC.
- 7.123 We expect that the equipment used to provide direct access at neutral access points is also used by BT to provide other services such as internet peering. We therefore expect the incremental costs associated with providing interconnect for WCT would be comparatively small, and that any mark-up for common/shared costs should reflect the size of this activity as a proportion of all activities and services supported by that equipment.

Accommodation, power and Cablelink charges

- 7.124 Telecoms providers interconnecting with BT at BT exchanges require accommodation (and related services) in those exchanges to house their transmission equipment.

³⁴⁶Ofcom, 2021. [Wholesale Fixed Telecoms Market Review 2021-2026 statement, Volume 4](#), table 5.6, page 117. [Accessed 25 March 2021]

³⁴⁷IBC charges include an allocation of DLE equipment costs.

³⁴⁸As we have discussed in Section 6, we propose to impose a price cap for WCT based on the 2017 WCT cost model. This is a bottom-up model of a hypothetical next-generation network (i.e. a hypothetical IP network) which is used to derive the LRIC of WCT. The 2017 WCT cost model was originally developed for the 2013 NMR. Annex 13 of the 2013 Narrowband Statement provides a detailed description of the model, including the interconnect nodes.

7.125 In the WFTMR 2021 Statement, we have imposed measures to address the risk of excessive pricing of accommodation, power and Cablelink services in the WLA markets (BT's charges for accommodation and Cablelink are subject to charge controls and BT's charges for power are subject to a basis of charges obligation).³⁴⁹ Our expectation is that BT's charges for accommodation, power, and Cablelink in connection with the provision of WCT will be fair and reasonable if they do not exceed BT's charges for the corresponding services provide in the WLA markets.

Figure 7.8: Summary of guidance on fair and reasonable charges obligation for IP interconnection and accommodation

Service	Guidance to fair and reasonable charges obligation
IPEX service set-up charges	Charges presumed to be fair and reasonable if reasonably derived from the cost of provision based on a forward looking long run incremental cost of provision of the applicable service allowing for an appropriate mark-up for common costs including an appropriate return on capital employed. We would expect any mark up for common costs such as overheads to be derived from information in the RFS to ensure overall costs are similar to FAC.
IPEX interoperability testing charges	Charges presumed to be fair and reasonable if charges in aggregate are reasonably derived from the costs of provision based on a forward looking long run incremental cost approach and allowing an appropriate mark up for the recovery of common costs including an appropriate return on capital employed. We would expect any mark up for common costs such as overheads to be derived from information in the RFS to ensure overall costs are similar to FAC.
IPEX interconnect circuit charges for direct access at BT exchanges	Benchmarked to Internal Cablelink Variant 1 charge in the WLA markets.
IPEX interconnect port charges for direct access at BT exchanges	Other than charges in respect of interconnect circuits (as discussed above), we would not expect the inclusion of these costs.
IPEX interconnect port charges for direct access at neutral access points and indirect access	To the extent that these methods of interconnection give rise to material additional costs, charges presumed to be fair and reasonable if in aggregate they are reasonably derived from the costs of provision based on a forward looking long run incremental cost approach and allowing an appropriate mark up for the recovery of common costs including an appropriate return on capital employed. We would expect any mark up for common costs

³⁴⁹ Ofcom 2021.WFTMR Statement, Volume 4, table 5.6, at page 117.

	such as overheads to be derived from information in the RFS to ensure overall costs are similar to FAC.
Accommodation for direct access at BT exchanges (Co-location and co-mingling)	Benchmarked to comparable services provided in Wholesale Local Access (WLA) markets.
Cablelink for direct access at BT exchanges (external and internal)	Benchmarked to comparable service provided in WLA markets.
Power/electricity at direct access at BT exchanges	Benchmarked to comparable service provided in WLA markets.

Source: Ofcom.

Migration remedies specific to BT

Background

- 7.126 As noted above, BT intends to transfer its fixed line telephone services to its IP network by 2025. Openreach has announced that it will withdraw its WLR and ISDN products also by 2025 in preparation for the withdrawal of BT's TDM network.³⁵⁰ In connection with these plans, BT is developing plans to transfer the POC for each of the telephone number blocks that currently reside on its TDM network to its IP network. The effect of these transfers would be to change the POC at which WCT is provided (and therefore where the regulated FTR is charged) from a nominated DLE to a relevant POC on BT's IP network.
- 7.127 The migration to IP is an industry-wide transformation of the telephone network. Other telecoms providers with TDM fixed networks are expected to transfer their fixed line telephone services to IP networks broadly over a similar period. However, BT's plans are a major component of this transition to IP-based telephony services because it is the largest provider of fixed call termination.
- 7.128 In May 2020, BT shared a draft plan for its number block migration programme with industry and sought feedback.³⁵¹ BT said that its IP migration programme would proceed on a DLE by DLE basis over a period of 12-18 months, commencing around early 2023.
- 7.129 BT also proposed to publish a migration timetable which would be updated monthly during the migration programme. Under its proposed timetable, it would provide a 12-month notice of the provisional date that it proposes to re-designate the POC for all number blocks associated with each DLE to its IP network POCs, with the provisional date being confirmed three months beforehand, and not subject to subsequent alteration. To help

³⁵⁰ [Openreach's website](#) outlines the timeline for the withdrawal of WLR products. [Accessed 10 March 2021]

³⁵¹ BT has shared a presentation entitled 'All-IP Migration Interconnect Charging Update: phase 2 Number Block Migrations' (dated 12 May 2020) with us as well as other telecoms providers. The presentation outlined its initial proposals of the principles it would follow during its number block migration.

ensure an orderly migration, BT also proposed that it would provide WCT at the relevant DLE as well as at the IP network POCs for a period of one month following redesignation of each number block.

New requirements for BT to provide transparency about its migration timetable

Our proposals

7.130 In our August 2020 Consultation, we considered that BT should be subject to an obligation requiring it to provide transparency about its migration plans. We proposed that BT should be required to publish a migration timetable for transferring geographic number blocks to POCs on its IP network, subject to the following conditions:

- **Consultation about migration timetable:** BT would be required to consult with Ofcom and telecoms providers about its proposed timetable at least 2 months before publishing the timetable.
- **Publication of migration timetable:** BT would be required to publish its timetable by 1 June 2022.
- **Migration dates:** BT would be required to ensure that the migration dates (for switching geographic number blocks to POCs on its IP network) are between 1 January 2023 and 31 March 2025.
- **12-month notification of proposed migration date:** BT would have to give at least 12-months' notice of the date by which it plans to switch the POC for geographic number blocks from TDM interconnection to the DLE to IP interconnection (the migration date).
- **90-day notice to postpone proposed migration date:** during the 12-month notice period, BT would be able to postpone its proposed migration date for a number block by giving at least 90-day notice of a postponement and revised migration date. Likewise, BT would have to give at least 90-day notice of any further variation to the migration date after the end of the 12-month notice period.
- **30 days of simultaneous WCT availability on TDM and IP:** once the POC for a geographic number block has switched to IP interconnection, telecoms providers would still have the option of purchasing WCT at the relevant DLE for that block for a period of 30 days from the migration date.

Stakeholder responses

7.131 The FCS³⁵², Magrathea³⁵³, TalkTalk³⁵⁴, Telecom2³⁵⁵, UKCTA³⁵⁶, Vodafone³⁵⁷, and another telecoms provider Name Withheld-2³⁵⁸ were supportive of our proposal to impose on BT an

³⁵² The FCS response to the August 2020 Consultation, page 4.

³⁵³ Magrathea response to the August 2020 Consultation, page 5.

³⁵⁴ TalkTalk response to the August 2020 Consultation, pages 6-7, paragraphs 6.6 to 6.8.

³⁵⁵ Telecom2 response to the August 2020 Consultation, page 6.

³⁵⁶ UKCTA response to the August 2020 Consultation, page 4.

³⁵⁷ Vodafone response to the August 2020 Consultation, page 9-10.

³⁵⁸ Name Withheld-2 [redacted] response to the August 2020 Consultation, page 1.

obligation to publish a timetable and provide transparency about its migration plans. However, several respondents suggested that BT should be required to give more notice to help telecoms providers to manage migration:

- TalkTalk³⁵⁹ suggested that BT should be required to publish its migration timetable by 1 January 2022, 6 months earlier than proposed, to align with the date by which BT would need to publish its timetable to commence migration in early 2023 as per its draft migration plan.
- Vodafone³⁶⁰ and UKCTA³⁶¹ argued that BT should be required to commit to number block migration dates six months ahead, as opposed to the proposed 90 days.
- Vodafone³⁶², UKCTA³⁶³ and TalkTalk³⁶⁴ argued that the proposed 30 days of simultaneous WCT availability on TDM and IP should be extended to 90 days.

7.132 BT agreed with our proposal but said that other large telecoms providers should also be required to share their migration plans with BT.^{365 366}

Our reasoning and decision

7.133 We have decided to require BT to publish a migration timetable for transferring geographic number blocks to POCs (where WCT is made available) on its IP network. In line with our consultation proposals, we have decided that these obligations should reflect the key features of BT's draft migration plan with certain amendments to address respondents' comments.

7.134 Our decision addresses our central concern that uncertainty about BT's plans, or unexpected changes to those plans, could have a negative impact on competition.

7.135 Telecoms providers will need to rely on BT's plan to migrate by the end of 2025 well in advance of that date, in order to make appropriate decisions on matters such as whether to renew maintenance contracts, and when to decommission legacy networks.

7.136 Given the scale of the change, and the fact that it is unlikely to be economic (and perhaps not possible) for telecoms providers to reinstate TDM equipment and interconnect circuits after decommissioning, telecoms providers need certainty about BT's migration process to make appropriate investment decisions in relation to their voice networks.

7.137 An unpredictable or delayed migration by BT could result in telecoms providers incurring excessive costs. Telecoms providers that have TDM interconnects with BT will want to plan the decommissioning of their TDM assets as the migration of BT's POCs progresses. If there is uncertainty about BT's migration plans, they may retain their TDM assets (which will be stranded after migration) unnecessarily or, conversely, prematurely dispense with them,

³⁵⁹ TalkTalk response to the August 2020 Consultation, page 7, paragraph 6.8.

³⁶⁰ Vodafone response to the August 2020 Consultation, page 30.

³⁶¹ UKCTA response to the August 2020 Consultation, paragraph 12.

³⁶² Vodafone response to the August 2020 Consultation, page 30.

³⁶³ UKCTA response to the August 2020 Consultation, paragraph 13.

³⁶⁴ TalkTalk response to the August 2020 Consultation, page 9, paragraph 6.18.

³⁶⁵ BT response to the August 2020 Consultation, page 19.

³⁶⁶ [BT supplementary response](#) (interconnection migration note) to the August 2020 Consultation, pages 1-2.

which may provide BT with the opportunity to charge them excessive amounts for IP-to-TDM media conversion and conveyance.

- 7.138 As TDM equipment becomes even more difficult and expensive to maintain, the potential costs faced by telecoms providers to maintain outdated TDM assets also increase and, without the certainty of an end-date for migration, telecoms providers could face those costs for an indefinite period of time. If BT's migration of its POCs results in excessive costs being incurred by competing telecoms providers, that could distort competition, resulting in price rises and harm to customers.
- 7.139 Moreover, BT's high share of WCT volumes and importance as a partner for other fixed providers means that the impact of uncertainty about BT's migration plans would have greater effect on competition than similar uncertainty in relation to other telecoms providers' migration plans.
- 7.140 We describe the key features of the obligations we have imposed below.

Requirement to consult on the migration timetable

- 7.141 We have decided that prior to publication of its timetable for migrating its POCs to IP interconnection, BT should consult with Ofcom and industry. This is so that BT can seek input on whether the timetable and the information provided gives other telecoms providers sufficient certainty and notice to plan their own migrations to IP. BT must provide details of its timetable no less than two months before it is published.

Requirement to publish timetable and to give 12-month notice of migration

- 7.142 BT will be required to publish its timetable specifying the migration date for switching its geographic number blocks to POCs on its IP network. It will be required to publish the timetable at least 12 months before migration commences and by 1 June 2022 at the latest.
- 7.143 We do not believe it is necessary to bring forward the latest publication date, as TalkTalk suggested, as this date is intended as a backstop to prevent undue delay. In addition, as discussed below, BT has indicated that it may commence the migration programme somewhat earlier than originally envisaged.
- 7.144 When BT publishes its timetable, we also expect it to provide information on how its number block migration will be administered, as well as how updates to the timetable would be communicated to relevant parties.

Migration dates

- 7.145 We have decided to amend the interconnection migration dates. In our August 2020 Consultation, we proposed that BT should be required to ensure that the migration dates for switching geographic number blocks to POCs on its IP network are between 1 January 2023 and 31 March 2025. This reflected BT's draft migration plan which envisaged that migration would commence in early 2023.
- 7.146 In its response to our August 2020 Consultation, BT asked us to amend the earliest date for migration to 1 April 2022 so that it is not prevented from bringing the migration

programme forward.³⁶⁷ Our understanding is that many telecoms providers would like migration to progress as soon as possible provided that sufficient notice is given. We have therefore amended the obligation to remove the earliest migration date, allowing BT to commence migration as soon as it is ready. This is subject to the requirement to consult and to give 12-month notice.³⁶⁸ BT must also, as far as is possible, ensure that the migration of number blocks to its IP network are evenly spread across the migration period.

Notice about postponement and simultaneous availability of WCT

- 7.147 We have decided to require BT to provide 90 days' notice of postponement of number block migration, and to provide simultaneous availability of WCT on BT's TDM and IP networks for a calendar month from the date of migration.
- 7.148 This decision is in line with our consultation proposal, save that we have changed the period when WCT will be available simultaneously on BT's TDM and IP networks from 30 days to 1 calendar month, in response to BT's response that this period should be aligned with its billing cycle.³⁶⁹
- 7.149 In relation to the notice periods, respondents have suggested that BT should be required to give greater notice about postponement of number block migration (6 months rather than 90 days) and to make WCT simultaneously available at TDM and IP POCs for longer after migration (90 days). Vodafone told us that 30 days' simultaneous availability is insufficient given the amount of work required to be conducted by telecoms providers to facilitate a migration. Vodafone considered that a period of 90 days would enable telecoms providers to plan effectively and complete all the necessary work to enable migration to occur smoothly, without fear of commercial penalties.³⁷⁰
- 7.150 In our view, the timetable obligations strike a reasonable balance between providing telecoms providers with as much notice as possible about BT's migration plans and providing BT with flexibility to adjust its migration plans to reflect progress with the migration of WLR services.
- 7.151 We remain of the view that the timetable obligations will provide telecoms providers with sufficient notice of BT's plans. Publication of the timetable will provide telecoms providers with visibility of BT's migration plans in sufficient detail to determine the engineering resources required to support the migration programme. Migration dates will be confirmed three months prior to migration allowing time for preparatory configuration activities to be undertaken. Telecoms providers will also be able to spread the reconfiguration activities over the period of simultaneous availability without incurring additional conveyance charges.

³⁶⁷ BT response to the August 2020 Consultation, page 19.

³⁶⁸ As discussed above, BT would have the option to start migration later, subject to the requirement to publish its migration timetable by 1 June 2022 at the latest and to give at least 12 months' notice of migration.

³⁶⁹ BT response to the August 2020 Consultation, page 21.

³⁷⁰ Vodafone response to the August 2020 Consultation, pages 30-31.

- 7.152 In addition, given the scale and complexity of the WLR withdrawal programme, there is inevitably some uncertainty about whether the programme will progress as forecast, particularly progress with WLR migration at individual DLEs which determines the optimal trigger point for number block migration. Increasing the notice period for postponement to six months would significantly reduce BT's flexibility to manage number block migration to accommodate such uncertainty (e.g. by revising the order in which DLEs are migrated to reflect progress with WLR migration). It could therefore impair BT's ability to manage traffic flows between its TDM and IP networks, increasing the risk of congestion in the tandem layer of BT's TDM network and media conversion resources.
- 7.153 In relation to the simultaneous availability of WCT on BT's TDM and IP networks, BT has explained that while it is relatively straightforward for it to adapt its billing system to provide simultaneous availability of WCT over a single billing cycle of one month, longer periods would require a major development of its billing system and also 6-9 months to test the new software.³⁷¹ As discussed above, we consider that the timetable obligations provide telecoms providers with sufficient notice of BT's plans and do not require an extension to the period of simultaneous availability. Consequently, as noted, the only change we have made to the length of this period is to revise it to 1 calendar month.
- 7.154 Figure 7.9 below summarises the timetable obligations we have decided to impose.

Figure 7.9: Summary of IP migration timetable obligations

Requirement	Requirement description
Consultation	BT must consult with Ofcom and telecoms providers at least 2 months before finalising the migration timetable.
Timetable publication	BT must publish the migration timetable by 1 June 2022.
Notification of migration dates	BT must give at least 12 months' notice of when it proposes to switch the POC for geographic number blocks from TDM interconnection to IP interconnection.
Migration dates	BT must ensure that the number block migration dates are between 1 April 2022 and 31 March 2025.
Notification of postponement of migration dates	During the 12 months' notice period, BT will be able to postpone its proposed migration date for a number block by giving at least 90 days' notice of a postponement and revised migration date. Likewise, BT must give at least 90 days' notice of any further variation to the migration date after the end of the 12 months' notice period.
Simultaneous availability of WCT on TDM and IP	Once the POC for a geographic number block has switched to IP interconnection, providers will still have the option of purchasing WCT at

³⁷¹ BT supplementary response (interconnection migration note) to the August 2020 Consultation, page 2.

	the relevant DLE for that block for a period of one month from the migration date.
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Source: Ofcom.

Timetable obligations will apply only to BT

- 7.155 In our August 2020 Consultation, we proposed that the obligation to publish a timetable for the migration of POCs should apply only to BT. As noted above, BT said that the obligation should be extended to the larger telecoms providers, specifically those with more than 350 TDM number ranges plus prefixes as of 1 April 2021.³⁷² BT subsequently proposed that we should consider imposing a staggered transparency obligation requiring telecoms providers to share their migration plans two months after BT publishes its migration plan.³⁷³ BT said that visibility of larger telecoms providers migration plans would enable it to provide them with a smooth migration experience and would result in lower cumulative industry migration costs with resulting benefits for all telecoms providers and indirectly lower costs for their customers. BT was concerned that there may be a risk of a coordination failure since telecoms providers may not be incentivised to share their plans, notwithstanding that doing so would deliver mutual benefits.
- 7.156 BT also emphasised that reconfiguring its network to redirect traffic to other telecoms providers IP networks would be a major undertaking and that it has finite capacity to process telecoms providers' DMA requests for such changes. It would therefore need visibility of other telecoms providers' plans so that it could agree dates for the work.³⁷⁴
- 7.157 We remain of the view that migration timetable obligations for telecoms providers other than BT are not warranted. Given BT's scale, industry-wide migration to IP is influenced by how and when BT migrates the POCs from its TDM network to its IP network. Therefore, telecoms providers will require an understanding of BT's timetable before they can determine the speed at which they should dismantle their TDM assets to interconnect with BT. We also consider that telecoms providers have a strong incentive to share their plans with BT, not least because they will need to secure BT's agreement to execute DMA requests to reconfigure BT's traffic to their networks.
- 7.158 We expect industry to work together to ensure an efficient and smooth migration to IP. We therefore welcome BT's suggestion that it will explore an industry forum for interconnect migration specifically,³⁷⁵ and Ofcom intend to engage on this with BT. Such a forum could help build a common understanding of the constraints such as telecoms providers' engineering resources and BT's DMA capacity which will shape the industry wide programme.
- 7.159 In relation to the detail of the arrangements for number block migration, UKCTA said that they would like to see the migration done in large enough number blocks (e.g. 10K) to

³⁷² BT response to the August 2020 Consultation, at footnote 24.

³⁷³ BT supplementary response (interconnection migration note) to the August 2020 Consultation, page 3.

³⁷⁴ BT response to the WVMR Consultation 2021-2026, pages 19-20.

³⁷⁵ BT supplementary response (interconnection migration note) to the August 2020 Consultation, page 3.

avoid complexity driven by granularity.³⁷⁶ TalkTalk said that BT should be explicitly incentivised by the regulation to migrate all number blocks on a DLE in a single move because this would be more efficient as it would avoid telecoms providers having to maintain TDM interconnection within a DLE area. We believe that detailed implementation discussions such as these are better considered as part of BT's industry consultation on migration to IP. We note however that BT has already proposed that it will migrate number blocks on a DLE-by-DLE basis.

Other transition risks

- 7.160 TalkTalk said that the proposed timetable obligations did not address the transition risk linked to calls associated with end-users' telephone lines which would continue to reside on BT's DLEs after the POC for number blocks associated with a DLE had been moved to IPEX. TalkTalk said that it would be inefficient for it to retain its TDM interconnect circuits for these traffic types and asked us to amend the charging arrangements so that BT would bear the cost of conveying calls between the DLE and IPEX, specifically:
- Calls to numbers ported to BT – after number block migration, BT should be required to provide WCT at IPEX.
 - Average porting conveyance charges – after number block migration, ported calls should be treated as having originated at IPEX.
 - NGCS calls originated at DLEs – after number block migration, BT should bear the cost of delivering calls to IPEX.³⁷⁷
- 7.161 We are not persuaded that measures suggested by TalkTalk, to the extent they are within the scope of this review, are warranted. BT plans to complete WLR withdrawal by 2025, so the residual traffic flows described by TalkTalk will be for a limited period. Telecoms providers will need to make commercial decisions about whether to maintain TDM interconnect circuits or to purchase additional conveyance services from BT for such traffic. We also note that:
- Calls to ported numbers – our understanding is that BT has proposed charging arrangements consistent with those suggested by TalkTalk.
 - Average porting conveyance charges – in accordance with General Condition B3.6, donor providers are prohibited from levying any charges which are additional to the conveyance of non-ported calls.
 - NGCS call origination charges fall outside the scope of this review.

³⁷⁶ UKCTA response to the WVMR Consultation 2021-2026, page 4.

³⁷⁷ TalkTalk response to the August 2020 Consultation, pages 10-11, paragraphs 6.21 to 6.25.

From 1 April 2025, termination charges for all geographic calls to be as if BT's migration to IP is complete

Our proposal

7.162 In our August 2020 Consultation, we proposed that in addition to the timetable obligations, BT should be required to charge for terminating geographic calls as if it has completed the migration of POCs for all its number blocks to its IP network. BT would therefore be required to provide WCT at the regulated FTR at an IP POC. We proposed that this obligation should apply from 1 April 2025.

Stakeholder responses

- 7.163 Both Magrathea and TalkTalk said that BT should be required to offer WCT at an IP POC earlier than proposed. TalkTalk said that the requirement should apply from April 2023, the date when BT is expected to commence its migration programme. It estimated that at some point in 2022 BT would have sufficient media conversion capacity to carry the remaining TDM traffic and that further capacity would become available when migration commences in early 2023.³⁷⁸ TalkTalk also said that in setting the date for when the obligation to apply, Ofcom did not present evidence about the capacity of BT's network to handle IP calls earlier than proposed.³⁷⁹ Magrathea argued that the proposed date could be sooner than 2025 so that BT is provided with incentives to accelerate migration to the IP network.³⁸⁰
- 7.164 Telecom2 argued that it would be better to tie the end date to the completion of transition from TDM to IP to allow for slippages in timescales.³⁸¹
- 7.165 Gamma disagreed with our proposal. It questioned whether the migration timetable was realistic. It was concerned that in the event of delays, BT might seek to recover its costs from other parts of its portfolio.³⁸²
- 7.166 While agreeing with our proposal, BT argued that the obligation to provide FTR at an IP POC by 1 April 2025 should be extended to all telecoms providers; or alternatively, Ofcom should provide an explicit written comfort allowing BT not to provide TDM interconnection to any telecoms provider after April 2025. BT said that without such measures it would have to continue to support TDM interconnection. It said this would impose a disproportionate cost on BT since it would have to maintain its TDM network until all telecoms providers have migrated.³⁸³

³⁷⁸ TalkTalk response to the August 2020 Consultation, pages 7-8, paragraphs 6.9 to 6.17.

³⁷⁹ TalkTalk response to the August 2020 Consultation, page 8, paragraph 6.16.

³⁸⁰ Magrathea response to the August 2020 Consultation, page 5.

³⁸¹ Telecom2 response to the August 2020 Consultation, page 6.

³⁸² **Gamma** response to the August 2020 Consultation, page 5, paragraph 14.

³⁸³ BT response to the August 2020 Consultation, page 23.

Our reasoning and decisions

- 7.167 We have decided to impose on BT an obligation requiring it from 1 April 2025 to charge for terminating geographic calls as if it has completed the migration of POCs for all its number blocks to its IP network. As we set out above, our central concern is to avoid distortion to competition for telecoms providers which may arise due to delay or uncertainty about BT's migration plans. One of those competition concerns is that providers may retain their TDM assets unnecessarily. The potential costs and difficulties faced by telecoms providers to maintain outdated TDM assets may also increase over the review period and, without the certainty of an end-date for migration, telecoms providers could face those costs for an indefinite period of time.
- 7.168 Our decision will mean that termination (charged at the FTR) will be available for IP interconnected traffic, without the additional charges for media conversion and conveyance. The obligation will prevent BT from levying excessive charges in the event of delays to its own migration timetable and will give telecoms providers the certainty that they need to make efficient investments in IP technology at the appropriate time in response to that timetable.
- 7.169 We continue to believe that this obligation should apply from 1 April 2025. In arriving at the date of 1 April 2025, we exercised our regulatory judgment. We took into account the objectives we want to achieve with our obligation, namely ensuring regulatory certainty to telecoms providers and preventing distortion to competition, the potential impact on customers, and stakeholder responses.
- 7.170 We disagree with TalkTalk and Magrathea views that we should bring forward the obligation on BT to provide FTR at an IP POC earlier than 1 April 2025. This obligation is intended as a backstop, and not a measure to accelerate migration. It aims to provide certainty to telecoms providers so that they can plan their networks and take informed decisions concerning decommissioning of legacy equipment and prevent BT from levying excessive charges if migration is not complete by 1 April 2025.
- 7.171 Conversely, an early date could have a negative impact on customers, because a lack of a gradual and managed migration could result in unnecessary costs to BT, and at the extreme may have an impact on the stability of BT's network, to the detriment of customers. Many telecoms providers would be likely to switch all of their interconnection to BT's IP network ahead of BT's end-user migration. This would in turn mean BT conveying an increased amount of calls between its TDM and IP networks. To deal with this increase in calls conveyed to its IP network, BT would need to invest in extra media conversion capacity in the short-term, which would become immediately redundant after BT's migration is complete.
- 7.172 Moreover, there would be a risk that an upsurge in traffic between BT's IP and TDM networks which could cause network congestion, leading to call failures and, in the

extreme, to destabilise BT's voice network. BT has highlighted the risk of a significant impact on overall service due to the potential for network congestion.³⁸⁴

7.173 We consider those concerns will have dissipated by 1 April 2025:

- First, BT's current plans indicate that its number block migration should be complete by late 2024 (given it should commence by early 2023 and should take 12 to 18 months). This is also broadly in line with BT's stated plan to withdraw all WLR and ISDN services by the end of 2025.
- Second, even if WLR migration takes longer than expected, the majority of WLR services should have been migrated by April 2025. Consequently, the volume of intra network IP-to-TDM traffic should be well past its peak and therefore the requirement for media conversion and intra network conveyance should also be well past its peak. We therefore believe that the requirement should not necessitate any significant additional investment in media conversion capacity by BT.

7.174 We recognise that it might be possible to impose the obligation before 1 April 2025 without giving rise to these adverse consequences. However, we consider that it is difficult to determine reliably the earliest possible date when these adverse consequences could be avoided, at least until the migration programme is underway. Moreover, an earlier date would significantly increase the risk of the adverse consequences discussed above. We also believe that such a detailed assessment is unnecessary in light of our objective to provide certainty to industry, for which a backstop date is sufficient.

Obligation only applicable to BT

7.175 We have decided that the obligation to provide FTR at an IP POC will apply only to BT. No other telecoms provider has a comparable scale in WCT to BT and therefore, there is limited risk that other telecoms providers with a significant amount of number blocks residing on TDM networks would be able to levy excessive charges on others for IP-to-TDM traffic.

7.176 We do not consider that comparable obligations for other telecoms providers are warranted as BT has suggested, or that the lack of such obligations would impose a disproportionate burden on BT. We remain of the view that other telecoms providers are unlikely to have an incentive to retain their TDM assets, once BT (the largest single voice network) is operating effectively as a network that is entirely IP-based from 2025. Therefore, any continued use of TDM interconnection by other providers is likely to be comparatively short-term. Were this to become an issue, we are able to reconsider IP interconnection regulation in the next market review.

³⁸⁴ BT response to Ofcom IP migration Questions (dated 27 July 2020).

Other points related to interconnection provided by BT

Commercial services provided by BT

Our proposals

- 7.177 In our August 2020 Consultation, we noted that several respondents to the 2019 First Consultation had expressed concerns about the unregulated commercial services provided by BT. In summary:
- Respondents considered that the terms offered in BT's IPEX reference offer (which are for the services it provides to those that interconnect with its IP network) compared unfavourably with the terms offered as part of BT's Standard Interconnect Agreement (SIA) (which are for the services it offers to those that interconnect with its TDM network).
 - Respondents considered that the terms offered in the SIA (as well as its related documents relating to charges) afford BT too much control, in particular to impose its own charges and to reject charges proposed by others.
- 7.178 We noted that we had proposed a package of remedies which were designed to ensure that the price and non-price terms offered by BT for WCT and associated interconnection and other associated facilities would be fair and reasonable. We therefore expected that BT would have to revise some of the terms, conditions and prices for its regulated IPEX services if our proposals were confirmed.
- 7.179 We also noted that the SIA and the IPEX reference offer related mainly to commercial conveyance and transit services provided by BT which are currently unregulated. We therefore considered that negotiations to revise those contracts would be a commercial matter between industry participants.³⁸⁵

Stakeholder responses

- 7.180 Respondents to our August 2020 Consultation again raised concerns about the commercial services provided by BT.
- 7.181 ITSPA³⁸⁶, Magrathea³⁸⁷, UKCTA³⁸⁸ and Vodafone³⁸⁹ said that BT's interconnect contracts should be revised to address certain deficiencies in those contracts.
- ITSPA, Magrathea and UKCTA argued that BT's IPEX contract is not fit for purpose for a variety of reasons, including contractual provisions which allow BT to terminate the contract at short notice and which afford it too much control over pricing. Some of these respondents suggested that BT's IP interconnection services should be

³⁸⁵ August 2020 Consultation, paragraph 7.121.

³⁸⁶ ITSPA response to the August 2020 Consultation, at pages 7-8.

³⁸⁷ Magrathea response to the August 2020 Consultation, at pages 8-9.

³⁸⁸ UKCTA response to the August 2020 Consultation, paragraphs 6-11.

³⁸⁹ Vodafone response to the August 2020 Consultation, at pages 203, paragraphs 3-7.

incorporated into the SIA as this contract had been subject to industry and regulatory scrutiny over many years.

- UKCTA and Vodafone considered that the SIA also requires amendment to make it more balanced and reflective of a commercial contract. The changes proposed included:
 - Contractual terms relating to modifications to charges – respondents considered that these terms favour BT, allowing it to amend its charges and to refuse amendments proposed by other telecoms providers. Respondents therefore sought amendments to make these terms reciprocal.
 - Balance of commercial risk – changes to the terms to strike a fair balance of commercial risk between BT and other telecoms providers.
 - Transit services – amendment to the terms to facilitate the purchase of transit services by BT from other telecoms providers and to align BT’s transit charges with those of other telecoms providers.

7.182 A telecoms provider [redacted] considered that [redacted].³⁹⁰

7.183 Magrathea³⁹¹, UKCTA³⁹², Vodafone³⁹³ and another telecoms provider [redacted]³⁹⁴, had wider concerns about competition, arguing that BT continues to play a central role in the provision of a range of unregulated commercial services (transit, conveyance, porting and ancillary services such as emergency calls and text relay) and is able to exert undue influence over the provision of such services. UKCTA and Vodafone considered that the SIA is a contributory factor because it affords BT too much power, in part because of its legacy as a contract for regulated services.

7.184 A telecoms provider Name Withheld-2, also suggested that Ofcom should consider how certain industry functions which currently reside in the SIA should be managed in future. These include:

- BT’s Data Management Amendment process (which is used to disseminate information about telephone number block transactions).
- BT’s number portability transit services (which allow telecoms providers to utilise BT’s porting agreements for number porting).
- BT’s contractual terms for Artificial Inflation of Traffic (traffic which is fraudulent or of no commercial purpose) which are effectively an industry benchmark which are referenced by other interconnect agreements.³⁹⁵

³⁹⁰ [redacted]

³⁹¹ Magrathea response to the August 2020 Consultation pages 3, 8 and 9.

³⁹² UKCTA response to the August 2020 Consultation, paragraphs 3-5

³⁹³ Vodafone response to the August 2020 Consultation, paragraphs 1.1 to 1.15

³⁹⁴ [redacted]

³⁹⁵ Name Withheld-2 [redacted] response to the August 2020 Consultation, pages 1-2

7.185 UKCTA said that the industry and UKCTA are prepared to resource work on a revised contract.³⁹⁶ UKCTA³⁹⁷ and Vodafone³⁹⁸ said that OTA facilitation and Ofcom oversight would be required. UKCTA also considered that Ofcom would need to require BT to participate in negotiations.³⁹⁹

Our reasoning and decisions

7.186 As stated above, we have decided that BT should be subject to several interconnection obligations, including a network access obligation, which requires BT to provide IP interconnection on fair and reasonable terms, conditions and charges for WCT services at its IP network. We are also providing guidance as to how we would be likely to assess whether BT's charges are fair and reasonable. In addition, we have decided that BT should be required to publish a reference offer for such services, to make both pricing and non-pricing terms and conditions transparent, and a no undue discrimination obligation, to ensure that terms and conditions offered do not favour other parts of BT Group or specific competitors to the detriment of competition.

7.187 Our package of measures requires that the term and conditions, including charges, which apply to the provision of interconnection at BT's IP network in respect of WCT (once the POCs have been migrated to IP) are fair and reasonable.⁴⁰⁰

7.188 As a consequence, we expect that BT will have to review the IPEX reference offer and to revise some of the terms, conditions and charges which pertain to the regulated services, at least with respect to IP interconnection charges.

7.189 The commercial services provided by BT such as conveyance and transit are unregulated and are outside the scope of this review.

7.190 BT has told us that it plans to withdraw the SIA once TDM services are fully withdrawn. Topics such as DMA, number portability and AIT will be covered in the IPEX contract.⁴⁰¹

7.191 As most of the services provided by BT and other telecoms providers under the SIA and the current IPEX contract are unregulated commercial services, we consider that negotiations to revise those contracts to be a commercial matter between industry participants. In carrying out those negotiations, BT will need to ensure that the outcome is compliant with its regulatory obligations.

7.192 Finally, we note that two topics appear to be central to respondents concerns about the contracts:

- concerns about the notice periods for contract termination in the IPEX contract; and

³⁹⁶ UKCTA response to the August 2020 Consultation, paragraph 7.

³⁹⁷ UKCTA response to the August 2020 Consultation, paragraph 7.

³⁹⁸ Vodafone response to the August 2020 Consultation, paragraph 6.

³⁹⁹ UKCTA response to the August 2020 Consultation, paragraph 7.

⁴⁰⁰ Our enforcement guidelines set out the factors that we take into account when considering enforcement. Ofcom, 2017. [Enforcement guidelines for regulatory investigations.](#)

⁴⁰¹ Note of meeting between Ofcom and BT held on 29 January 2021.

- concerns about the terms of the SIA and the IPEX contract relating to changes to charges.

7.193 We set out below guidance on how the regulatory conditions we are imposing on BT in relation to WCT and interconnection are likely to apply to these issues.

Concerns about notice periods in BT's IPEX contract

7.194 Some respondents were concerned about the terms of BT's IPEX contract relating to contract termination, in particular that the notice period of 30 working days would be insufficient for them to secure alternative interconnect agreements. Respondents noted that the notice period is significantly shorter than the corresponding notice period in the SIA which is 24 months.

7.195 As previously discussed, the network access obligations we are imposing on BT requires it to provide WCT and associated facilities (including interconnection) on reasonable request and on fair and reasonable terms, conditions and charges. Consequently, there are likely to be limited circumstances under which BT could terminate the supply of these services (e.g. in cases of fraud or where there is a risk to network integrity). BT will also have to ensure that the contractual terms relating to contract termination are fair and reasonable.

7.196 We also note that most of the regulated and commercial services provided by BT and other telecoms providers under the IPEX contract are wholesale services which underpin the provision of Publicly Available Telephone Services (PATS) (e.g. WCT, conveyance and transit). Consequently, BT and other telecoms providers will need to ensure that the terms relating to contract termination and notice periods are consistent with their legal obligations which apply to the provision of PATS, including General Condition A3.2(b) which requires providers of PATS to take all necessary measures to ensure uninterrupted access to emergency organisations.

7.197 The contract termination arrangements and notice periods would therefore need to be sufficient for both parties to make alternative arrangements to avoid any interruption or degradation of their PATS. This would typically require the establishment of a new interconnect and would likely take some time given the need to agree contractual terms, deploy new interconnect circuits, commission and test the new interconnect.

Concerns about the pricing terms

7.198 Some respondents are concerned that both the SIA and the IPEX contract afford BT greater scope to revise charges for its services than that afforded to other telecoms providers to revise charges for their services.

7.199 The provision of WCT and associated facilities, including interconnection, will be subject to the network access obligations we are imposing on BT and other telecoms providers. In accordance with these obligations, telecoms providers must ensure that the terms for charge revisions are fair and reasonable.

7.200 If we needed to determine whether the terms offered by BT or another telecoms provider for WCT are fair and reasonable (e.g. in the context of an investigation or dispute

resolution) we would be likely to consider a range of factors.⁴⁰² These might include comparing the terms with the reciprocal terms applicable to the counterparty and the extent to which there is a justification for any differences between the terms.

The End-to-End Connectivity Condition

- 7.201 BT is subject to an access condition under sections 73 and 74 of the Communications Act 2003 which requires BT to purchase wholesale call termination services for any telecoms provider that reasonably requests it, as soon as reasonably practicable and on reasonable terms and conditions, including charges. This condition is known as the ‘End-to-End Connectivity Condition’.
- 7.202 In the 2019 First Consultation we stated that it was our initial view that the case for the End-to-End Connectivity Condition appears weaker now and that BT’s role is less central to end-to-end connectivity. Several respondents to the 2019 First Consultation raised concerns about removing the End-to-End Connectivity Condition, typically remarking that GC A1 was insufficient to ensure telecoms providers can obtain interconnection and ensure end-to-end-connectivity.
- 7.203 The impact of retaining the End-to-End Connectivity Condition on BT seems limited compared with the concerns raised by stakeholders. Further, taking account of Ofcom’s policy decision not to require stakeholders to provide information during the Covid-19 pandemic lockdown, we decided to remove consideration of the End-to-End Connectivity Condition from the scope of our review. However, it remains open to us to reconsider this matter during the market review period if the market evolves as all networks move towards IP-based networks.
- 7.204 None of the respondents to our August 2020 Consultation commented on our decision to remove the End-to-End Connectivity Condition from the scope of our review.⁴⁰³

Remedies for providers other than BT

Our proposals

- 7.205 We proposed that we do not need specific interconnection regulation for telecoms providers other than BT, other than the network access condition which requires telecoms providers to provide such associated facilities as are reasonably necessary and requires those facilities to be provided on fair and reasonable terms, conditions and charges.⁴⁰⁴

⁴⁰² Ofcom, 2017, Enforcement Guidelines for Regulatory Investigations.

⁴⁰³ As discussed above, BT referred to the End-to-End Connectivity Condition in its comments about the need for remedies for IP interconnection and in connection with our proposal that telecoms providers other than BT should not be subject to timetable obligations.

⁴⁰⁴ We have made slight adjustments to the wording of SMP Conditions 1.2 and 1.3 to make it clear that network access charges which are not covered by a charge control are subject to a fair and reasonable obligation under SMP Condition 1.2.

Stakeholder responses

- 7.206 Although respondents were generally supportive of the regulation we proposed for telecoms providers other than BT, none provided detailed comments.

Our reasoning and decisions

- 7.207 In theory, telecoms providers other than BT could also seek to leverage their SMP in WCT into the provision of interconnection. However, no other telecoms provider has a share of WCT comparable to BT's or such a central role as that of BT in the provision of wholesale voice services. Moreover, where two telecoms providers are of similar scale and subject to identical regulatory obligations in the WCT market and seek to purchase WCT from each other to support their downstream customers, we consider that there is less likely to be a competitive distortion in the provision of interconnection requiring further *ex ante* regulation.
- 7.208 Therefore, we have decided that the network access condition is sufficient to address our competition concerns and that we do not need to impose additional interconnection remedies for telecoms providers other than BT. The network access condition requires telecoms providers to provide such associated facilities as are reasonably necessary and requires those facilities to be provided on fair and reasonable terms, conditions and charges.⁴⁰⁵ We explain our reasoning for imposing the network access condition to all providers with SMP in WCT in section 6 of this statement.

Other points relating to all providers

Designation of Multiple POCs for IP networks

- 7.209 The network access requirement for WCT means that telecoms providers must make available, on request, at least one POC where only the regulated FTR is charged.
- 7.210 During this review we have considered whether telecoms providers should maintain this discretion to nominate a single POC, given that conveyance costs are generally not considered to be strongly distance dependent in IP networks, and that in practice some telecoms providers designate multiple POCs for WCT (at which the FTR is made available).

Our proposals

- 7.211 In our August 2020 Consultation we proposed that on balance it remained appropriate that telecoms providers should maintain their discretion to designate a single POC for WCT at which the regulated FTR is charged.

⁴⁰⁵ We have made slight adjustments to the wording of SMP Conditions 1.2 and 1.3 to make it clear that network access charges which are not covered by a charge control are subject to a fair and reasonable obligation under SMP Condition 1.2.

Responses to the 2019 First Consultation

- 7.212 Most respondents to the 2019 First Consultation said that telecoms providers should maintain their discretion to nominate a single POC for WCT, while noting that in practice most telecoms providers make WCT available (at the regulated FTR) at multiple POCs.
- 7.213 A minority of respondents argued that it would be reasonable for telecoms providers to be required to make the FTR available at all of their IP network POCs as conveyance costs are not distance dependent in IP networks.⁴⁰⁶

Stakeholder responses

- 7.214 UKCTA said that allowing telecoms providers to maintain the discretion to designate a single POC for WCT could be open to abuse. Telecoms providers could revise POC designations or designate POCs in remote locations to increase competitors' costs. It would also permit telecoms providers to levy conveyance charges, notwithstanding that conveyance costs are not distance dependent in IP networks.⁴⁰⁷
- 7.215 ITSPA had similar concerns, arguing that BT would be able to impose excessive costs on telecoms providers by massively increasing the number of POCs on its IP network (e.g. by replicating its TDM interconnect architecture by deploying 650 POCs and continuing to levy conveyance charges for calls not delivered to the nominated POC).⁴⁰⁸
- 7.216 Vodafone said that there is uncertainty about where WCT should be made available by telecoms providers and where charges should be subject to commercial negotiation. Although the accepted wisdom is that telecoms providers should provide WCT at the nearest handover point to the terminating customer there remains ambiguity which could allow the regulation to be gamed. At one extreme, telecoms providers could adopt a network architecture which would make it practically impossible to connect to the designated POCs (and by extension to obtain WCT at the regulated FTR rate), and at the other telecoms providers might be required to provide WCT at every POC, which would not reward those providers who have deployed large extensively connected networks. Vodafone said there was a need for further regulatory guidance about where the regulated FTR should apply and that it should be developed by Ofcom in collaboration with telecoms providers following the market review.⁴⁰⁹
- 7.217 Magrathea noted that BT currently offers the regulated FTR at all the POCs in its IP network. It considered that it would be unreasonable for BT to restrict the availability of the FTR to individual POCs, regardless of how it might distribute the traffic between the Session Border Controllers (SBCs) in future, because of the very low costs associated with transporting traffic between POCs and SBCs. Magrathea suggested that BT should be

⁴⁰⁶ Responses to the Question 4.4 of the 2019 First Consultation can be found on [the Ofcom website](#). [Accessed 25 March 2021]

⁴⁰⁷ UKCTA response to the August 2020 Consultation, paragraphs 16-17.

⁴⁰⁸ ITSPA response to the August 2020 Consultation, page 10.

⁴⁰⁹ Vodafone response to the August 2020 Consultation, pages 11-12, paragraphs 1.17-1.20.

required to ensure that telecoms providers interconnecting with it at two POCs (for resilience purposes) should be able to obtain the regulated FTR for all BT number blocks.⁴¹⁰

Our reasoning and decisions

- 7.218 The network access requirement for WCT means that telecoms providers must make available, on request, at least one POC where only the regulated FTR is charged. It also requires telecoms providers to provide WCT on fair and reasonable terms, conditions and charges. We remain of the view that telecoms providers should retain the discretion to decide how they discharge these obligations, including where appropriate to nominate a single POC at which the FTR is available. We do not consider that it is appropriate for us to adopt a prescriptive approach as there will be significant differences between networks (e.g. in size and geographic reach as Vodafone has pointed out). Telecoms providers will therefore need to be able to specify interconnection arrangements which reflect the characteristics of their networks.
- 7.219 With regards to the concerns raised by ITSPA, Magrathea, UKCTA and Vodafone that telecoms providers might abuse the flexibility to nominate a single POC, we note that telecoms providers must ensure that network access is provided on fair and reasonable terms, conditions and charges in accordance with the network access requirement. Interconnection arrangements consistent with this obligation would be likely to reflect the underlying architecture of IP networks and established industry norms concerning interconnection and approach to interconnect resilience. We would therefore expect that telecoms providers should be able to obtain WCT in a resilient manner by interconnecting at a small number of POCs.
- 7.220 Arrangements, such as those cited by ITSPA, Magrathea, UKCTA and Vodafone, which are intended to make it difficult to obtain WCT or to impose unnecessary costs (such as requiring telecoms providers to interconnect at an unnecessarily large number of POCs to obtain WCT) are unlikely to be consistent with the network access obligation.

Hosted services

- 7.221 As we have discussed in section 5, a number range holder may not always control its own access network and may instead choose to purchase some or all of the network elements required to physically terminate the call from another telecoms provider. We refer to such arrangements as hosting.⁴¹¹

Our proposals

- 7.222 In our August 2020 Consultation, we noted that during the course of our review, concerns had been raised with us that some telecoms providers who are using hosted services have not ensured that the regulated rate has been made available at a relevant POC by the hosting provider and relatedly that some such telecoms providers do not respond to

⁴¹⁰ Magrathea response to the August 2020 Consultation, page 6.

⁴¹¹ See section 5 for further details.

requests to open negotiations about interconnection for WCT. We therefore sought submissions from telecoms providers about the incidence of such problems, their materiality and what further measures we could take to ensure compliance.

Stakeholder responses

- 7.223 ITSPA⁴¹², Magrathea⁴¹³ and Simwood⁴¹⁴ had concerns about the current arrangements. In particular, they were concerned that BT appeared to be applying transit charges for geographic number ranges it hosts on IPEX. They noted that telecoms providers that use hosting services rely on their hosting provider to provide a range of services such as interconnect and portability in compliance with regulatory requirements. ITSPA and Simwood considered that hosting providers should be subject to the network access obligations for geographic number ranges they host and should be required to provide a POC at which WCT is available at the regulated rate. Magrathea suggested that Ofcom should review and clarify the obligations.
- 7.224 Vodafone considered that hosting arrangements are being used by operators to avoid making WCT available at the regulated FTR. It noted that hosting providers have no obligation to highlight where WCT is available, and hosted providers are often difficult to contact.⁴¹⁵ Vodafone suggested that Ofcom should implement measures to remedy the problems, in particular:
- hosting providers should be required to highlight the availability of WCT for number ranges they host and to provide contact details for the range holders;
 - hosting providers should be prohibited from applying transit charges for hosted number ranges⁴¹⁶; and
 - Ofcom should publish a contact list for all geographic range holders.⁴¹⁷
- 7.225 BT said that our guidance in the 2017 NMR Statement had not clearly defined hosting and that we should clarify that it is not the responsibility of a telecoms provider providing transit or hosting services to offer an FTR POC on behalf of another telecoms provider unless it had been explicitly requested to do so.⁴¹⁸

Our reasoning and decisions

- 7.226 As we discuss in section 5, we have defined the market for WCT in relation to the number range holder. Although the number range holder may choose to purchase some or all of the network elements required to physically terminate calls from another telecoms provider (the hosting provider) and this may extend to the hosting provider concluding termination agreements, the number range holder retains ultimate control over the

⁴¹² ITSPA response to the August 2020 Consultation, pages 4-6.

⁴¹³ Magrathea response to the August 2020 Consultation, pages 6-7.

⁴¹⁴ Simwood response to the August 2020 Consultation, pages 5-7.

⁴¹⁵ Vodafone response to the August 2020 Consultation, page 32.

⁴¹⁶ Vodafone response to the August 2020 Consultation, page 28.

⁴¹⁷ Vodafone response to the August 2020 Consultation, page 11.

⁴¹⁸ BT response to the August 2020 Consultation, page 21.

number range. Consequently, it would not be possible for us to impose SMP conditions (such as an obligation to provide WCT) on hosting providers.

- 7.227 We understand that some fixed telecoms providers may reach a commercial agreement to combine FTRs with charges for unregulated services such as transit or conveyance. However, the network access requirement for WCT means that telecoms providers must make available, on request, at least one POC where only the regulated FTR is charged.
- 7.228 We recognise that some respondents believed that there needs to be additional clarity on the responsibility of the hosted provider. For the avoidance of doubt, the position remains that, where telecoms providers have chosen to use a hosting telecoms provider, in accordance with the network access obligation, they must ensure that the regulated FTR is available at a POC on the hosting network. It is therefore their responsibility to ensure that their contractual arrangements reflect their regulatory obligations.
- 7.229 Further, in accordance with the network access obligation, irrespective of whether a hosting provider is used, telecoms providers must provide access as soon as reasonably practicable on receipt of a request for WCT. In fulfilling that obligation, we expect providers to respond promptly to requests for such access. The numbering data published on Ofcom's website lists the registered company name of the telecoms provider to whom each geographic number block has been allocated. It is therefore possible to obtain the registered office address from Companies House records.⁴¹⁹ Failure to respond to written requests addressed to a registered office address would be a factor that we would take into account when assessing compliance with the network access obligation and with the obligation to negotiate on request interconnection with another provider under General Condition A1.2.

⁴¹⁹ Companies House. [Register search facility](#).

8. Regulatory Financial Reporting for WCT and interconnection

- 8.1 This section sets out the regulatory financial reporting requirements we are imposing on BT in relation to the WCT market and associated interconnection.
- 8.2 Our main decisions are to:
- Remove the requirement on BT to publish market level information on WCT and interconnection;
 - Maintain the requirement on BT to publish service level revenue, volume, and price information for WCT and TDM interconnection at the DLE;
 - Require BT to publish revenue, volume, price, and cost information for some IP interconnection services;
 - Require BT to provide cost information on TDM and IP interconnection to us privately; and
 - Allow BT to prepare cost information for interconnection separately from its cost allocation system.

Purpose of regulatory reporting

- 8.3 BT is currently subject to regulatory financial reporting requirements in relation to many SMP markets in which it is regulated. These requirements are imposed on BT by way of an SMP condition set in each regulated market, and directions imposed in each market pursuant to the associated SMP condition. The SMP condition sets out our general regulatory financial reporting requirements, including accounting separation and cost accounting. The directions then set out our detailed regulatory financial reporting requirements.
- 8.4 As part of these requirements, each year BT must prepare Regulatory Financial Statements (RFS). The RFS are prepared according to a defined framework and methodology and include published statements as well as information that is not published but submitted to Ofcom privately.
- 8.5 BT's regulatory financial reporting obligations secure the creation and retention of the information needed for our regulation of SMP markets, particularly charge controls, to be, and be seen to be, effective. They provide us with the information necessary to help us make informed regulatory decisions, for example cost information to support charge controls on an ongoing basis, and information necessary to assess the impact and effectiveness of our decisions, for example, trends in the usage and returns associated with regulated services. They also enable us to monitor and, if necessary, enforce no undue discrimination and some pricing regulations.
- 8.6 Publication of some information helps inform stakeholders so they can have confidence that BT is complying with its obligations and that regulation is effective and appropriate to

achieve its purpose. It enables them to identify and bring issues to our attention and effectively contribute to the regulatory regime. This promotes confidence in the market, which in turn creates some of the conditions for effective competition.

8.7 We have previously said that effective reporting should have the following attributes⁴²⁰:

- **Relevance.** The information needs to answer the right questions, in the right way and at the right time;
- **Reliability.** The underlying data must be reliable. Suitable rules for the treatment of data must be chosen and those rules need to be followed;
- **Transparency.** The basis of preparation should be understood by the users of the reports and the presentation of the data should be clear; and
- **Proportionality.** The reporting requirements should be proportionate to the benefits.

WFTMR 2021 statement

8.8 In the WFTMR 2021 Statement we set out changes to the reporting obligations which currently apply to BT in fixed telecoms markets to ensure the information BT is required to provide in the next market review period continues to meet the reporting attributes set out above.⁴²¹

8.9 We imposed an SMP Condition on BT with general requirements for accounting separation and cost accounting.⁴²² The purpose of this SMP condition is to ensure that sufficient and robust information is published by BT and provided privately to Ofcom to enable us to perform our duties and for stakeholders to have confidence that BT has complied with its SMP conditions.

8.10 This SMP condition also serves as a basis for imposing directions on BT that set out detailed regulatory financial reporting requirements. The directions we imposed on BT in the WFTMR Statement are:

- i. Regulatory Accounting Principles Direction;
- ii. Preparation, Delivery, Publication, Form and Content Direction (“Form and Content Direction”);
- iii. Consistency with Regulatory Decisions and Regulatory Asset Value Direction;
- iv. Audit of the RFS Direction;
- v. Reconciliation Report Direction; and
- vi. Network Components Direction.

⁴²⁰ See for example our [July 2019 Regulatory Financial Reporting \(RFR\) Statement](#). [Accessed 25 March 2021]

⁴²¹ The relevant markets are physical infrastructure, wholesale local access (WLA), leased line access and inter-exchange connectivity.

⁴²² These include requirements to publish a Change Control Notification and Reconciliation Report and for the RFS to be audited.

- 8.11 To ensure the overall coherence of the RFS, the decisions we are making in this Statement are aligned with the SMP condition and directions in the WFTMR 2021 Statement.
- 8.12 In particular, we consider that 5 of the 6 directions made in the WFTMR Statement also apply in respect of WCT and interconnection to the extent they are relevant.⁴²³ We do not repeat the text of these directions in this Statement. We have made some amendments to the Form and Content Direction to capture our reporting requirements in relation to WCT and interconnection, as set out below.
- 8.13 The rest of this section is structured as follows:
- Regulatory reporting SMP remedies (accounting separation and cost accounting) for WCT and interconnection; and
 - Reporting requirements for WCT and interconnection, separately discussing published information, private information, and preparation and assurance requirements.

Regulatory reporting SMP remedies (accounting separation and cost accounting) for WCT and interconnection

Reporting remedies

Our proposals

- 8.14 In our August 2020 Consultation we proposed accounting separation and cost accounting obligations on BT in relation to the provision of WCT and associated interconnection services.

Stakeholder responses

- 8.15 No respondents to the consultation disagreed with our proposal. Responses to our consultation focused on the detailed reporting obligations for WCT and interconnection services. We consider these in the next section.

Our reasoning and decisions

- 8.16 We have decided to impose accounting separation and cost accounting obligations on BT in relation to the provision of WCT and associated interconnection services. We have implemented these obligations by way of a single SMP condition and associated directions (see Annex 5) which specify what information we require BT to prepare and provide for each market. Further details of the accounting separation and cost accounting obligations are set out below, with reasoning on specific aspects of them in the following section.

⁴²³ Directions i) and iii) – vi) as listed in paragraph 8.11 above. Where BT chooses to estimate costs for TDM and IP interconnection services using its cost accounting system (as explained below), it will be required to do so in line with directions iii) and iv) (the Consistency with Regulatory Decisions and Regulatory Asset Value Direction and the Network Components Direction).

- 8.17 We took account of the 2005 EC Recommendation on accounting separation and cost accounting systems⁴²⁴, and the 2013 EC Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment⁴²⁵, as they appeared to us to be relevant to the matters under review.

Accounting separation

- 8.18 We have imposed an accounting separation obligation on BT in relation to the provision of WCT and associated interconnection services. We consider that this obligation is necessary to monitor the overall impact and effectiveness of the remedies imposed and, in particular, to monitor BT's activities with regard to its no undue discrimination obligations.⁴²⁶
- 8.19 As BT is the only operator subject to specific interconnection remedies and a no undue discrimination obligation, we consider that the accounting separation obligation should only apply to BT (consistent with current regulation). The obligation is also necessary to give transparency to stakeholders that BT has complied with its SMP conditions and that robust information is being created and retained during the current period, in order to secure that SMP regulation which is imposed remains appropriate, a reassurance which promotes competition in the markets concerned and enables Ofcom to benefit from stakeholder input in monitoring compliance.
- 8.20 Requiring BT to produce financial statements on each regulated wholesale market, combined with an obligation to attribute costs in a fair, objective and transparent way (via the cost accounting obligation – see below) can also help prevent unfair cross-subsidy by ensuring that costs are not inappropriately loaded onto one set of regulated products to the benefit of another set of regulated products or unregulated products. We consider that this helps ensure that competition develops fairly, which ultimately benefits customers, and is the least onerous obligation necessary to ensure a mechanism exists to allow us and stakeholders to monitor potentially discriminatory behaviour by BT.
- 8.21 We consider that imposing an accounting separation obligation, together with a cost accounting obligation (see below) will help ensure these regulatory reporting objectives are met.

Cost accounting

- 8.22 Cost accounting obligations require the dominant provider to maintain a cost accounting system (a set of processes and systems) to capture the costs, revenues, assets and

⁴²⁴ [Commission Recommendation of 19 September 2005](#) on accounting separation and cost accounting systems under the regulatory framework for electronic communications (2005/698/EC) (the '2005 EC Recommendation')

⁴²⁵ [Commission Recommendation of 11 September 2013](#) on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment (2013/466/EU)

⁴²⁶ The accounting separation obligation requires BT to account separately for internal and external sales, which helps Ofcom and stakeholders monitor the activities of BT to ensure it does not discriminate unduly in favour of its own downstream business. In sections 6 and 7 we imposed no undue discrimination obligations on BT in WCT, interconnection and associated accommodation services.

liabilities associated with the provision of services and to attribute them in a fair, objective and transparent manner to individual services in order that the costs of individual services may be determined.⁴²⁷

8.23 We have decided to impose a cost accounting obligation on BT in relation to the provision of WCT and associated interconnection services to ensure that the processes and rules used by BT to attribute revenues and costs to these services under the Accounting Separation obligation are fair, objective and transparent. The cost accounting obligation is an important means of ensuring that, in this case:

- we have the necessary information to monitor and assess the effectiveness of pricing regulation, in particular to ensure that the pricing remedies we impose continue to address the competition problems identified and to enable our timely intervention should such intervention be needed;
- costs are attributed to markets (and the individual services within them) in a fair, objective, transparent and consistent manner. This mitigates the risk of cost over-recovery or that costs might be unfairly loaded onto particular products or markets, promoting confidence in the market;
- transparency (via publication of the processes and rules followed by BT) allows us to effectively challenge attribution processes and rules which we do not consider to be fair and objective;
- publication (i.e. reporting) of cost accounting information aids transparency, providing assurance to stakeholders about compliance with SMP obligations, allowing stakeholders to support Ofcom's monitoring of compliance and more generally promoting competition by providing reassurance that regulatory conditions are complied with;
- BT records all information necessary for the purposes listed above at the time that relevant transactions occur, on an ongoing basis. Absent such a requirement, there is a possibility that the necessary information would not be available when it was required for monitoring and enforcement purposes, and in the necessary form and manner; and

8.24 Absent such a requirement, some of our charge controls in the current regulatory period would be likely to be ineffective to address BT's SMP, as stakeholders could not be confident that the controls were effective to enable them to compete against BT on a fair basis. Price regulation generally would be likely to be less effective because stakeholders would not have confidence that if regulation continued to be required in the next regulatory period, the necessary information would be available for Ofcom to implement it. Finally, ongoing provision of information allows Ofcom and stakeholders to monitor, within the review period, the appropriateness of the assumptions made in setting charges and therefore enables a better ongoing understanding of the effectiveness of the remedies.

⁴²⁷ We note that paragraph 2 of Point 1 of the 2005 EC Recommendation states that "the purpose of imposing an obligation to implement a cost accounting system is to ensure that fair, objective and transparent criteria are followed by notified operators in allocating their costs to services in situations where they are subject to obligations for price controls or cost-oriented prices."

Implementation

- 8.25 We consider that there are significant advantages to BT and stakeholders of BT in applying one set of accounting rules across all markets, i.e. that the regulatory reporting condition applying accounting separation and cost accounting requirements on BT is consistent across markets. The Regulatory Financial Reporting SMP condition we have imposed on BT for WCT and associated interconnection services is set out in Annex 5 while the legal tests are set out in Annex 3.
- 8.26 Under this SMP condition we may from time to time make such directions as we consider appropriate in relation to BT's reporting obligations.
- 8.27 To give effect to our decisions, three directions imposed in the WFTMR Statement under section 49 of the Act will also apply in respect of the 'Regulatory Financial Reporting' SMP condition we are setting in relation to WCT and associated interconnection services. These directions are:
- Regulatory Accounting Principles Direction
 - Audit of the RFS Direction
 - Reconciliation Report Direction⁴²⁸
- 8.28 These directions are set out in Volume 7 of the WFTMR Statement.
- 8.29 We are giving the following direction under Section 49 of the Act and the 'Regulatory Financial Reporting' SMP Condition we are imposing in relation to WCT and interconnection:
- Form and Content direction
- 8.30 This direction is in line with a direction imposed in the WFTMR 2021 Statement with amendments to reflect our reporting decisions in relation to WCT and Interconnection, which are set out in below. In addition, where BT chooses to estimate costs for some interconnection services using its cost allocation system⁴²⁹ (as set out below), it will be required to do so in accordance with the following directions:
- Consistency with Regulatory Decisions and Regulatory Asset Value direction; and
 - Network Components Direction.
- 8.31 The directions we are imposing on BT in relation to WCT and associated interconnection services are set out in Annex 5 while the legal tests are set out in Annex 3.

Reporting requirements for WCT and interconnection

- 8.32 In our August 2020 Consultation we proposed to reduce the reporting requirements in relation to WCT and TDM interconnection and to introduce some reporting for IP interconnection to recognise the following:

⁴²⁸ See Volume 6, section 6 of the WFTMR 2021 Statement.

⁴²⁹ i.e. using CostPerform, BT's present cost allocation system.

- **Market size:** the revenues for WCT and TDM interconnection are very small compared to other reported SMP markets. For example, in 2019/20, BT's reported revenue for WCT and TDM interconnection (at the DLE) was £13m, 0.2% of its total SMP revenues.⁴³⁰
- **Transition period:** termination and interconnection traffic is expected to migrate from BT's TDM network to its IP network during this review period and our remedies aim to support this transition. We considered whether reporting requirements could be relaxed in some areas and introduced in others to reflect how we expect termination and interconnection to develop.
- **Focus on Openreach:** the February 2020 Reporting Consultation proposed to increase the focus of the RFS on Openreach's performance, as this is where most of our regulation sits.⁴³¹ WCT and interconnection is generally provided by a different part of BT, separate from Openreach. Following the proposed deregulation of WCO, we noted that WCT (including associated interconnection services) will be the only SMP market outside of Openreach with reporting obligations and so we considered whether some information, in particular cost information (where required), could be provided in a simpler way.

8.33 Our reporting proposals for WCT and interconnection were in relation to the following:

- Published information
- Private information
- Preparation and assurance

8.34 In the rest of this section we set out our decisions for each of these requirements and explain how they will be implemented.

Published information

Overall approach

Our proposals

8.35 To date, published RFS financial information relates to three broad areas:

- **Market level information.** This is information on the revenues, operating costs, capital employed and returns on mean capital employed (MCE) for each SMP market and for BT Group overall. There are three market level schedules in the RFS.⁴³² In the WFTMR statement we made changes to the way information is presented in these schedules and we have adopted the format of these schedules in this decision.⁴³³
- **Service level information.** This can include the revenue, volume, price and costs of specific services or groups of services associated with SMP markets. In the WFTMR

⁴³⁰ BT's 2019/20 RFS, page 25.

⁴³¹ BT's 2019/20 regulatory financial statements indicate that 96% of SMP market returns sit in Openreach.

⁴³² The performance summary by market, the attribution of operating costs and attribution of MCE schedules.

⁴³³ WFTMR 2021 Statement, paragraphs 3.5 to 3.76.

statement we decided that where we require BT to publish information on service costs, this would include operating costs, mean capital employed (MCE) and return on MCE (ROCE). We have adopted the format of this schedule in this decision, where applicable.

- **Breakdown of service level costs.** To date, a split of service level fully allocated costs (FAC) is provided by cost component, alongside a schedule showing how unit cost components are calculated.⁴³⁴ In the WFTMR Statement we decided to replace this with a breakdown of operating costs and MCE.⁴³⁵ We have adopted the format of this schedule in this decision, where applicable.

8.36 In our August 2020 Consultation we considered the information that BT must publish under each of these headings, noting that, to date, we had required BT to publish market and service level information for WCT and TDM Interconnection (though service level costs, and a breakdown of those costs by component, had only been published for TDM Interconnection, not for WCT).

8.37 We also said the objectives of publishing information include:

- assess compliance with remedies;
- assess impact and effectiveness of remedies;
- understand the impact of BT's cost attribution decisions; and
- contribute to an open and competitive market.

8.38 In general, we considered that some information should be published where BT has regulatory reporting obligations to allow stakeholders to have reasonable confidence that BT has complied with its SMP conditions, is providing the required data to Ofcom, and the reporting regime overall is working as planned.

Stakeholder responses

8.39 No stakeholders commented on our overall approach summarised above.

8.40 BT asked about the possibility of publishing information on wholesale voice markets in a separate document to the RFS, leaving the 'main RFS' as an Openreach-only set of statements.⁴³⁶

Our reasoning and decisions

8.41 As no stakeholders commented on our overall approach, in the following sections we set out our decisions on the market and service level information BT must publish for WCT and associated interconnection, taking account of the objectives set out above.

8.42 In response to BT, we note that the SMP condition and associated directions require BT to publish various documents which it currently puts on its website. The form and content

⁴³⁴ In BT's cost attribution system, costs are ultimately attributed to cost components which in turn are attributed to services.

⁴³⁵ WFTMR 2021 Statement, paragraphs 3.100 to 3.101.

⁴³⁶ [BT](#) response to August 2020 Consultation, page 24.

direction requires BT to publish various financial schedules and statements, including the audit opinion. To date, BT has published these as a single document.⁴³⁷ However, there is no obligation on BT to do so. The direction requires each of the financial schedules to be published in PDF and excel format, but BT has flexibility to publish these statements together or separately as it sees fit.

- 8.43 Therefore, as long as it is clear where stakeholders can find the information required to be published under the SMP condition and associated directions, and they are published in accordance with the templates in the direction, following the appropriate format where required, BT can publish the statements relating to voice markets in a separate document if it wishes.

WCT

Our proposals

- 8.44 We proposed that BT must publish information on revenues, prices, and volumes for a single WCT Service, split between internal and external customers. This was consistent with current requirements. We published a table showing what the proposed schedule would look like.⁴³⁸
- 8.45 We noted that BT should explain how it had derived WCT volumes reporting in this schedule in its accounting methodology document (AMD) and put any changes through the change control notification (CCN) process.
- 8.46 We did not propose to require BT to publish cost or ROCE information on WCT, saying that in practice this meant WCT would no longer appear in the three market level schedules.

Stakeholder comments

- 8.47 Vodafone disagreed with the proposal to remove the requirement on BT to publish market level information on WCT, saying this should only occur once the transition to IP is complete. Vodafone said that we should require BT to publish service level revenue, volume, and revenue for WCT while these facilities are used to secure FTR.⁴³⁹
- 8.48 BT said that, given the reduced market size and higher degree of focus on Openreach in the RFS, it supported our proposal to reduce the reporting requirements on WCT.⁴⁴⁰

Our reasoning and decisions

- 8.49 Reporting information can be used to assess the impact and effectiveness of the other remedies we have set in relation to WCT, as well as monitor BT's compliance. In section 6 we imposed a no undue discrimination obligation on BT in relation to the WCT market and

⁴³⁷ See for example, [Regulatory Financial Statements 2020](#). [Accessed 25 March 2021]

⁴³⁸ See Table 8.1, the August 2020 Consultation.

⁴³⁹ [Vodafone](#) response to August 2020 Consultation, page 32.

⁴⁴⁰ BT response to August 2020 Consultation, page 22. In addition, Telecom2 said it had no objections to our reporting proposals and FCS said it had no strong views.

a charge control on termination rates, with the control set at LRIC, based on a bottom up model adjusted for inflation.

- 8.50 Consistent with our proposal, we have decided that BT must publish information on revenues, prices, and volumes for a single WCT Service, split between internal and external customers.⁴⁴¹
- 8.51 Requiring BT to publish internal and external prices will help demonstrate BT’s compliance with the no undue discrimination obligation and allow stakeholders to see how average prices during the year compare to the WCT price cap. Publishing internal and external revenues and volumes would help demonstrate the impact of the remedies imposed on WCT and provide transparency about the relative usage of WCT by BT and external telecoms providers.
- 8.52 BT must publish the following schedule, as per our proposals.

Table 8.1: WCT service schedule

Detailed service analysis	Internal revenue	External revenue	Total revenue	Internal volume	External traffic	Internal average price	External average price
	£m	£m	£m	mm	mm	ppm	ppm
Wholesale call termination							
Total							

- 8.53 As per our proposals, BT must explain how it has derived call termination volumes in its AMD, including any assumptions it has made, and put any changes through the annual CCN process.
- 8.54 As the WCT charge control has been set by reference to LRIC using a bottom up model, we do not consider that publishing costs or returns based on fully allocated costs (FAC) would provide relevant information to stakeholders on WCT.⁴⁴² Further, since the pricing model does not rely on cost information from BT’s RFS, we do not consider cost information is required to assess the ongoing effectiveness of the control. For these reasons, and the fact that costs in the WCT market are relatively small⁴⁴³, we do not consider it would be proportionate to require BT to prepare and publish cost information relating to WCT during this control period.
- 8.55 In response to Vodafone, as we have decided not to require BT to publish cost information for WCT, we do not consider that WCT needs to be included in the three market level schedules. This is because without cost information, only revenue information would be published for WCT in these schedules, which BT is already required to provide in the service level schedule set out in Table 8.1.

⁴⁴¹ Note that, in line with the deregulation of WCO, BT will no longer have reporting requirements for WCO.

⁴⁴² In the last two years for example, WCT returns have been -64% and -74% (from the 2019/20 RFS). When WCO was also reported, these negative returns for WCT could be contrasted against the higher returns for WCO (33% and 43% in the last two years) – where these higher WCO returns reflected our previous decision to recover costs shared between WCT and WCO from WCO prices. With the deregulation of WCO, this will no longer be the case during this review period.

⁴⁴³ In 2019/20 £86m of operating costs and £123m of MCE was associated with WCT – representing around 2% of total SMP operating costs and 1% of total SMP MCE.

TDM interconnection at the DLE

Our proposals

- 8.56 We proposed that BT must publish information on external revenues, prices, and volumes for each service in the TDM interconnection basket while the charge control is in place for TDM interconnection services at the DLE.
- 8.57 We said that only information on services in the basket which connect at the DLE need to be published and we proposed that BT includes a note in the RFS where any service is omitted as it does not connect at the DLE.⁴⁴⁴ We published a table showing what the proposed schedule would look like.⁴⁴⁵
- 8.58 We said that reported revenues should be gross of any revenue shares of discounts associated with the traffic passed over the circuits.⁴⁴⁶
- 8.59 We proposed that BT must publish this information to the extent it relates to the period that the charge control is in place for TDM interconnection.
- 8.60 We did not propose to require BT to publish cost or return information on TDM interconnection, saying that in practice this meant WCT would no longer appear in the three market level schedules.

Stakeholder responses

- 8.61 BT said that, given the reduced market size and higher degree of focus on Openreach in the RFS, it supported our proposal to reduce the reporting requirements on TDM interconnection.⁴⁴⁷
- 8.62 BT said that CSI and ISI circuits are not connected at DLE so it would not be able to report these services. BT suggested CSI and ISI circuits are removed from the TDM interconnection service schedule.⁴⁴⁸
- 8.63 Vodafone disagreed with the proposal to remove the requirement on BT to publish market level information on TDM interconnection, saying this should only occur once the transition to IP is complete. Vodafone said that we should require BT to publish service level revenue, volume and revenue for TDM interconnection while these facilities are used to secure FTR.⁴⁴⁹ It also said we should require BT to publish cost information on TDM interconnection to ensure transparency around migration.⁴⁵⁰

⁴⁴⁴ In the current RFS for example, CSI and ISI links are not published as they do not connect at the DLE.

⁴⁴⁵ See Table 8.2, August 2020 Consultation.

⁴⁴⁶ This is consistent with the definition of external revenue in the TDM charge control condition.

⁴⁴⁷ BT response to the August 2020 Consultation, page 22.

⁴⁴⁸ BT response to the August 2020 Consultation, page 24.

⁴⁴⁹ Vodafone response to the August 2020 Consultation, page 32.

⁴⁵⁰ Vodafone response to the August 2020 Consultation, page 32.

Our reasoning and decisions

- 8.64 Reporting information can be used to assess the impact and effectiveness of the other remedies we have set in relation to TDM Interconnection, as well as monitor BT's compliance. In section 7 we imposed a CPI-0% charge control on a basket of TDM interconnection services and a sub-cap of CPI+10% for each service within the basket. This is the same as the existing regulation on TDM interconnection charges. We also imposed a no undue discrimination obligation in relation to TDM interconnection services.
- 8.65 Consistent with our proposal, we have decided that BT must publish information on external revenues, prices, and volumes for each service in the TDM interconnection basket while the charge control is in place for TDM interconnection services at the DLE. BT must publish the following schedule.

Table 8.2: TDM interconnection service schedule

Detailed service analysis	External revenue £m	External volume	Measure	External average price £
Wholesale CSI connections				
Wholesale CSI rentals - fixed				
Wholesale CSI rentals - per km				
Wholesale IEC connections				
Wholesale IEC rentals - fixed				
Wholesale IEC rentals - per km				
Wholesale Intra-building circuits connections				
Wholesale Intra-building circuits rentals				
Wholesale ISI links rentals				
Wholesale ISI links per km				
Wholesale rearrangements				
Total TDM Interconnection at DLE				

Note: Some of these services will not be published to the extent they do not connect at the DLE.

- 8.66 Only information on services in the TDM interconnection basket which connect at the DLE needs to be published. Where services in the basket do not connect at the DLE, BT can omit these services from the schedule but must include a note explaining which basket services have been omitted. This could include CSI and ISI circuits as BT noted in its response.⁴⁵¹
- 8.67 Within this schedule, reported revenues should be gross of any revenue shares of discounts associated with the traffic passed over the circuits.⁴⁵²
- 8.68 As with WCT, BT must explain how it has derived TDM interconnection volumes in its AMD, including any assumptions it has made (for example to identify TDM interconnection at the

⁴⁵¹ In the 2019/20 RFS for example, CSI and ISI links were not published as they do not connect at the DLE.

⁴⁵² This is consistent with the definition of external revenue in the TDM charge control condition.

DLE versus TDM interconnection at the tandem layer), and to put any changes through the annual CCN process.

- 8.69 Requiring BT to report price information for these services will allow stakeholders to see how average prices compare to the price caps. We consider that publishing service level revenues and volumes helps demonstrate the impact of the regulation we have applied to TDM interconnect circuits (for example by reference to trends in volumes and revenues). Combined with IP interconnection reporting (see below) our requirements will also help show trends in TDM and IP interconnection usage and migration while publishing revenues will allow stakeholders to see the revenues that are used as the weighting in the charge control basket formula.
- 8.70 The basket control on TDM interconnection will prevent an increase in prices in real terms and maintain a stable regulatory environment during the transition to IP interconnection. Given this, we do not consider that cost information is required for stakeholders to assess the effectiveness of the remedy. Consequently, and given the costs of TDM interconnection at the DLE are very small (and likely to reduce further as migration to IP occurs)⁴⁵³, we do not consider it would be proportionate to require BT to publish cost information relating to TDM interconnection during this control period. Therefore, we have decided not to require BT to publish cost or return information on TDM Interconnection.
- 8.71 As with WCT, because we have decided not to require BT to publish cost information for TDM interconnection, we do not consider that TDM interconnection needs to be included in the three market level schedules. This is because without cost information, only revenue information would be published for TDM interconnection in these schedules, which BT is already required to provide in the service level schedule set out in Table 8.2.

IP interconnection

Our proposals

- 8.72 We proposed that BT must publish information on external revenues, prices, and volumes for the following IP interconnection services:
- IP Exchange service establishment charges;
 - IP Exchange interoperability testing charges;
 - IP Exchange interconnect port charges for direct access at BT exchanges;
 - IP Exchange interconnect port charges for direct access at neutral access points;
 - IP Exchange interconnect port charges for indirect access; and
 - Other IP interconnection services⁴⁵⁴ (if applicable).

⁴⁵³ In the 2019/20 RFS BT reported operating costs of £4m and MCE of £5m for TDM interconnection at the DLE, representing less than 0.1% of total SMP operating costs and MCE.

⁴⁵⁴ We said this would exclude charges associated with accommodation, power and Cablelink required to interconnect at BT exchanges per our proposal to report these within a 'Shared Ancillaries' schedule.

- 8.73 We published a table showing what the proposed schedule would look like and proposed that BT must publish this information from the start of the review period.⁴⁵⁵
- 8.74 For service establishment charges, interoperability testing charges and IP Exchange port charges for direct access at neutral access points (NAP) and indirect access, we proposed that BT publishes a note under this schedule showing its estimate of the costs of providing each of these services, including any mark up for common costs and return on capital employed. We proposed that BT could estimate costs for these IP interconnection services outside of its cost accounting system. We did not propose to require BT to publish cost information on any other IP interconnection services
- 8.75 We proposed to require BT to report accommodation, power and Cablelink services required for IP interconnection in the Shared Ancillaries schedule consulted on as part of the February 2020 WFTMR Consultation.

Stakeholder responses

- 8.76 Vodafone agreed that BT should publish revenue, volume, price, and cost information for some IP interconnection services.⁴⁵⁶
- 8.77 BT agreed that charges for accommodation, power and Cablelink should be reported in a Shared Ancillaries schedule in the RFS.⁴⁵⁷
- 8.78 BT said the costs associated with interconnection services are expected to be low and it supported our proposals for estimating and publishing costs for these services. However, BT said that detailed costs for IP interconnection services would need to be reported on an apportionment basis as ports are used to exchange various types of traffic, not just for WCT into BT.⁴⁵⁸

Our reasoning and decisions

- 8.79 Reporting information can be used to assess the impact and effectiveness of the other remedies we have set in relation to IP Interconnection, as well as monitor BT's compliance. In section 7 we imposed fair and reasonable charging obligations on IP interconnection services, supplemented by guidance in Figure 7.8 explaining how we would assess whether those charges are fair and reasonable.⁴⁵⁹ We also imposed a no undue discrimination obligation in relation to IP interconnection services.

IP interconnection

⁴⁵⁵ See Table 8.3, August 2020 Consultation.

⁴⁵⁶ Vodafone response to the August 2020 Consultation, page 32.

⁴⁵⁷ BT response to the August 2020 Consultation, page 25.

⁴⁵⁸ BT response to the August 2020 Consultation, page 24.

⁴⁵⁹ This guidance broadly said that charges for some services would be considered fair and reasonable if they reflected FAC, while charges for other services would be considered fair and reasonable if they were benchmarked to comparable services provided in WLA markets, or, in the case of some port charges, zero.

8.80 We have decided that BT must publish information on external revenues, prices, and volumes for the following IP interconnection services, in relation to which we have given guidance on fair and reasonable charges in section 7:

- IP Exchange service set-up charges⁴⁶⁰;
- IP Exchange interoperability testing charges;
- IP Exchange interconnect circuit charges for direct access at BT exchanges⁴⁶¹;
- IP Exchange interconnect port charges for direct access at BT exchanges;
- IP Exchange interconnect port charges for direct access at neutral access points;
- IP Exchange interconnect port charges for indirect access; and
- Other IP interconnection services⁴⁶² (if applicable).

8.81 The service level schedule for IP interconnection services is set out below. BT must publish this information from the start of the review period. We expect the volumes and revenues reported in this schedule will increase over time as migration to IP takes place. BT can omit services from this schedule where they are not provided but must include an explanatory note where this is the case.

Table 8.3: IP interconnection service schedule

Detailed service analysis	External revenue £m	External volume	Measure	External average price
IP Exchange service set-up charges				
IP Exchange Interoperability testing charges				
IP Exchange circuit charges - direct access at BT Exchanges				
IP Exchange port charges - direct access at BT Exchanges				
IP Exchange port charges - direct access at neutral access points				
IP Exchange port charges - indirect access				
Other IP interconnection charges (if applicable)				
Total IP interconnection				

8.82 Requiring BT to report price information will allow stakeholders to see how average prices compare to the benchmark prices (for circuit and port charges for direct access at BT Exchanges) and to costs (for some services – see below). We consider that publishing service level revenues and volumes will help demonstrate the impact of the regulation we are setting for BT’s IP interconnection services. Combined with TDM interconnection reporting our decisions will also help show trends in TDM and IP interconnection usage.

8.83 As with WCT and TDM interconnection, BT must explain how it has derived IP interconnection volumes for these services in its AMD, including any assumptions it has

⁴⁶⁰ This change from ‘establishment’ charges that we consulted on is consistent with the terminology in section 7.

⁴⁶¹ We have added this service as in section 7 we distinguish between circuit charges and port charges for direct access at BT exchanges.

⁴⁶² Excluding charges associated with accommodation, power and Cablelink required to interconnect at BT exchanges per our decision to require BT to report these within a ‘Shared Ancillaries’ schedule.

made (for example to identity port charges required to terminate voice calls from those used for other purposes). Any changes must go through the annual CCN process.

- 8.84 For service set-up charges, interoperability testing charges and IP Exchange port charges for direct access at neutral access points and indirect access, we have decided to require BT to publish a note under this schedule showing its estimate of the costs of providing each of these services, split between incremental costs (e.g. costs directly associated with the provision of these services), any mark up for common costs (e.g. general overheads) and return on capital employed (where applicable).⁴⁶³ This will help assess BT's compliance with the fair and reasonable charging obligation set out in Section 7, given the guidance we have set.
- 8.85 We expect the costs associated with these IP interconnection services to be small compared to other regulated parts of BT. Given these are the only costs we are requiring BT to publish outside of Openreach, we do not consider it would be proportionate to require BT to estimate these costs through its cost accounting system (though it could if it wished⁴⁶⁴) for the period of this market review. Instead, we have decided that BT can estimate these costs outside of its cost accounting system.⁴⁶⁵ BT would need to explain how it has estimated these costs in its AMD, including any assumptions made, and demonstrate to us how it has ensured that costs attributed to other SMP markets (in its cost accounting system) were not included in its estimate of IP interconnection service costs.⁴⁶⁶ We recognise that in estimating these costs, BT may need to allocate costs between different IP services. BT must explain how it has done this in its AMD.
- 8.86 As cost information is only relevant to assessing compliance with some IP interconnection services, and given the small amount of costs expected to be associated with IP interconnection generally, we do not consider that cost information for all IP interconnection services is required for stakeholders to assess the effectiveness of our remedies. Therefore, we do not consider it would be proportionate to require BT to publish cost and return information relating to all IP interconnection services during this control period. This is consistent with our approach to TDM interconnection.
- 8.87 As with WCT and TDM interconnection, because we have decided not to require BT to publish cost information for IP interconnection overall (just for the services identified above), we do not consider that IP interconnection needs to be included in the market level schedules. This is because without cost information, only revenue information would

⁴⁶³ Where the allowance for return on capital employed is estimated by multiplying mean capital employed by the appropriate 2021 cost of capital. In this case the appropriate cost of capital would be the Other UK telecoms cost of capital from the WFTMR 2021 Statement.

⁴⁶⁴ Where BT chooses to prepare these costs using its cost accounting system, it must do so in accordance with the Consistency with Regulatory Decisions and Regulatory Asset Value Direction and the Network Components Direction set out in the WFTMR 2021 Statement. This will ensure the overall coherence of costs prepared using BT's cost accounting system across different SMP markets.

⁴⁶⁵ For example, by assessing the operational and capital costs directly associated with these services along with an estimate of indirect costs. This may require BT to allocate some costs where they are shared with other services.

⁴⁶⁶ For example, BT could estimate any overhead uplifts by reference to RFS information to ensure overall costs for these services are similar to FAC.

be published for IP interconnection in these schedules, which BT is already required to provide in the service level schedule set out in Table 8.3.

Shared ancillaries

- 8.88 In section 7 our guidance on charges for accommodation, power and Cablelink was that these would be considered fair and reasonable if they were benchmarked to the comparable service provided in WLA markets.
- 8.89 In the WFTMR Statement we decided that, as the price of these service was the same across all WFTMR SMP markets, they should be reported in aggregate (rather than in each SMP market) as part of a 'Shared Ancillaries' schedule in the RFS.⁴⁶⁷
- 8.90 As our guidance on these services for IP interconnection is that they should be benchmarked to comparable charges in WLA markets, to ensure the reporting of these services is straightforward, we have decided that the Shared Ancillaries schedule in the RFS should also include any accommodation, power and Cablelink services required for IP Interconnection.

Format of market level schedules

Our proposals

- 8.91 We proposed a small amendment to the three market level schedules consulted on in the February 2020 Reporting Consultation to reflect our proposals that WCT, TDM interconnection and IP interconnection would not appear in these schedules. This amendment saw a single column for 'Rest of BT' (i.e. revenues and costs related to BT's non-Openreach operations) reported in these schedules, with a note below the 'performance summary by market schedule' of the revenues associated with each of WCT, TDM interconnection and IP interconnection included in the Rest of BT column, alongside a note of where further information on these services can be found.

Stakeholder comments

- 8.92 BT agreed with our proposal.⁴⁶⁸

Our reasoning and decisions

- 8.93 In the WFTMR 2021 Statement, the format of the market level schedules included a single column for Rest of BT which we have adopted in this decision.
- 8.94 Under the 'performance summary by market' schedule, BT will be required to include a note of the revenues associated with WCT, TDM interconnection and IP interconnection included in the Rest of BT column.

⁴⁶⁷ Section 3, Volume 6, WFTMR 2021 Statement.

⁴⁶⁸ BT response to the August 2020 Consultation, page 24.

Implementation

- 8.95 The schedules for WCT and associated interconnection are included in the 'Form and Content' direction in Annex 5. The legal tests for the Form and Content direction are set out in Annex 3.

Private information

- 8.96 We require BT to provide us with some information privately. We require this information to make informed regulatory decisions, monitor compliance with SMP conditions and ensure that those SMP conditions continue to address the underlying competition issues.
- 8.97 Some of the information BT provides relates to all markets in the RFS (for example data and models supporting BT's regulatory accounting system), while other information is specific to certain SMP markets.
- 8.98 In our August 2020 Consultation we proposed to impose private reporting requirements applying to i) all SMP markets and ii) specific to TDM and IP interconnection, which we discuss below. We did not require any private reporting requirements specific to WCT.

Our proposals

Information applicable to all SMP markets

- 8.99 In the February 2020 Reporting Consultation, we proposed private reporting requirements on BT in relation to all WFTMR SMP markets. We proposed to impose these same requirements on WCT and associated interconnection to ensure a consistent set of requirements across all markets.

TDM and IP Interconnection

- 8.100 We proposed to require BT to provide us with cost information on TDM interconnection at the DLE and IP interconnection services from the start of the control period. We said BT could estimate these costs outside of its cost accounting system if it wished by providing the operational and capital costs directly associated with these services along with an estimate of indirect costs. We proposed to specify the type of cost information BT should provide on TDM and IP interconnection but expected to work with BT over the course of the period on the format and detail of the information provided.⁴⁶⁹
- 8.101 For service set-up charges, interoperability testing charges and IP Exchange port charges for direct access at neutral access points and indirect access we proposed to require that BT provides us with the full details and calculations supporting the costs we had proposed it publishes in a note to the RFS (see above).

⁴⁶⁹ Where BT estimates cost for interconnection outside of its cost allocation system, we proposed it will need to demonstrate to us that the costs are not also included in other SMP markets.

Stakeholder responses

8.102 No stakeholders commented on our proposals.

Our reasoning and decisions

Information applicable to all SMP markets

8.103 In the WFTMR 2021 Statement, we imposed private reporting requirements on BT in relation to all WFTMR SMP markets. We have decided to impose these same requirements on WCT and associated interconnection to ensure a consistent set of requirements across all markets in which BT has SMP.

TDM and IP Interconnection

- 8.104 We have decided to require BT to provide us with cost information on TDM interconnection services at the DLE and IP interconnection services. This will help us understand the costs of interconnection on an ongoing basis and the difference in costs between the different technologies. Where BT is required to publish costs for some IP interconnection services, private information on all published IP interconnection services will help us understand how those costs have been estimated.
- 8.105 Given the relatively low costs associated with interconnection compared to other regulated parts of BT and the fact that these are the only costs we would require BT to provide outside of Openreach, we do not consider it would be proportionate to require BT to estimate these costs through its cost accounting system (though it could if it wished).⁴⁷⁰
- 8.106 Instead, we have decided that BT could provide the operating and capital costs directly associated with the TDM and IP interconnection services published in the RFS (such as the costs of infrastructure, equipment and maintenance) along with an estimate of indirect costs (such as general overheads). This will likely require BT to allocate some costs where they are shared with other services. While we are specifying the type of cost information BT must provide on TDM and IP interconnection, we expect to work with BT over the course of the period on the format and detail of the information provided.⁴⁷¹
- 8.107 BT must provide us with the full details and calculations supporting the costs of IP interconnection services published in a note to the RFS (i.e. service set-up charges, interoperability testing charges and IP Exchange port charges for direct access at NAP and indirect access). This must include an explanation of how BT has estimated any mark up for common costs (such as general overheads), by reference to RFS information where this has been used.

⁴⁷⁰ Where BT chooses to prepare these costs using its cost accounting system, it will be subject to the requirements of the Consistency with Regulatory Decisions and Regulatory Asset Value Direction and the Network Components Direction set out in the WFTMR 2021 Statement. This will ensure the overall coherence of costs prepared using BT's cost accounting system across different SMP markets.

⁴⁷¹ Where BT estimates cost for interconnection outside of its cost allocation system, it will need to demonstrate to us that the costs are not also included in other SMP markets.

- 8.108 BT will be required to provide us with cost information on TDM interconnection and IP interconnection from the start of the control period.

Implementation

- 8.109 The requirements for private information related to all SMP markets and interconnection are included in the 'Form and Content' direction in Annex 5.

Preparation and assurance

Preparation of the RFS

- 8.110 We require BT to disclose how it has prepared the RFS to help assess whether its regulatory accounting systems attribute costs, revenues, assets, and liabilities to services in a fair, objective, and transparent manner. We consider that requiring BT to publish information on the basis of preparation contributes to an effective regulatory regime because it allows Ofcom to benefit from stakeholders' insights in considering compliance, assessing the effectiveness of remedies and considering whether any adjustments may be needed to the basis of preparation to ensure BT's RFS are reliable.
- 8.111 Sometimes we direct BT to prepare the RFS in a particular way, e.g. the use of specific attribution rules to be consistent with how we have taken regulatory decisions. Some of these directions affect all markets while some are market specific.⁴⁷²

Our proposals

- 8.112 In the February 2020 Reporting Consultation, we made proposals on what BT would be required to publish in relation to the preparation of the RFS. We also proposed some preparation requirements applicable to all SMP markets, for example the Regulatory Accounting Principles (RAP). To ensure the same requirements are imposed on all SMP markets where BT has SMP obligations we proposed to adopt the same requirements in our August 2020 Consultation.
- 8.113 We did not propose to make any preparation requirements specific to WCT or Interconnection.

Stakeholder responses

- 8.114 No stakeholders commented on our proposals.

⁴⁷² We have the power to impose consistency directions on BT under the SMP condition. BT is required to comply with the consistency direction while it is in force. Otherwise, BT can make changes to its attribution methods or policies, subject to compliance with the regulatory accounting principles, but must put those changes through the annual change control process. BT cannot propose a change that conflicts with a consistency direction.

Our reasoning and decisions

- 8.115 In the WFTMR 2021 Statement, we imposed requirements on BT to publish information on the preparation of the RFS. This included requirements in relation to the AMD, Wholesale Catalogue, Change Control Notification, Reconciliation Report, attribution diagrams and cost components.⁴⁷³ We also imposed preparation requirements applicable to all SMP markets, for example the RAP.⁴⁷⁴
- 8.116 To ensure the same requirements are imposed on all SMP markets where BT has SMP obligations we have adopted the same requirements in this decision.⁴⁷⁵ We have not made any preparation requirements specific to WCT or Interconnection.⁴⁷⁶
- 8.117 Publication requirements associated with the preparation of the RFS are included in the SMP Condition, in conjunction with the RAP direction imposed in the WFTMR Statement.

Assurance

- 8.118 As well as publishing information on how BT has prepared the RFS, we also require it to obtain an audit opinion. This gives assurance that the RFS is free from material error and has been prepared following the documentation published by BT and relevant directions issued by Ofcom. From time to time we also require BT to commission work from independent third parties to provide additional assurance.

Our proposals

- 8.119 In the February 2020 Reporting Consultation, we proposed to maintain the audit requirement on the RFS and to require BT to commission work from an independent third party as and when required by us. In our August 2020 Consultation we proposed to impose the same requirements.

Stakeholder comments

- 8.120 BT agreed with our proposal to maintain consistency on assurance requirements between those set out in the WFTMR and in this document.⁴⁷⁷

Our reasoning and decisions

- 8.121 In the WFTMR 2021 Statement, we decided to maintain the audit requirement on the RFS and to require BT to commission work from an independent third party as and when required by us.

⁴⁷³ WFTMR 2021 Statement, Volume 6, section 4.

⁴⁷⁴ WFTMR 2021 Statement, Volume 6, section 4.

⁴⁷⁵ We note that some requirements, such as the attribution diagrams, would not include WCT or interconnection as we have decided not to require cost information to be published at a market level.

⁴⁷⁶ As noted above, where BT chooses to estimate costs for TDM and IP interconnection services using its cost accounting system, it will be required to do so in line with two directions (the Consistency with Regulatory Decisions and Regulatory Asset Value Direction and the Network Components Direction).

⁴⁷⁷ BT response to the August 2020 Consultation, page 25.

- 8.122 We think it is important that the audit requirements are similar across SMP markets so the regulatory auditor can provide an overall opinion on the published RFS. We have therefore imposed the same requirements on WCT and associated interconnection in this decision.
- 8.123 The requirement to audit the RFS is set out in the SMP Condition, in conjunction with the Audit Direction imposed in the WFTMR Statement. The decision to require BT to commission work from independent third parties when required by us is set out in the SMP Condition.

9. WCT: technical standards for IP interconnection

- 9.1 This section considers the potential risks associated with variation in the technical standards used by telecoms providers for IP interconnection, and whether any further action is required to address those risks.
- 9.2 In summary, we have decided to incentivise the use of common technical standards by adopting guidance on the interpretation of the network access obligation.
- 9.3 We also discuss respondents' comments about the security and resilience of IP telephone services.

Background

- 9.4 The transition from TDM to IP networks will be accompanied by a shift from TDM to IP transport and signalling protocols⁴⁷⁸ for interconnection. Whereas TDM interconnection is by means of TDM transport technologies and SS7 signalling, IP interconnection uses Ethernet transport technologies and SIP signalling.
- 9.5 Although both the transport and signalling protocols are defined in international standards, these standards contain multiple configuration options and do not describe the configuration required to interwork with the UK TDM signalling protocols during the transition period. Consequently, the international standards are not fully suitable for UK usage 'off the shelf'.
- 9.6 The UK interoperability standards authority NICC has therefore undertaken further standardisation work regarding standards for UK use which are, in most regards, profiles of the international standards.⁴⁷⁹ Among other things, these profiles specify:
- Configuration options to ensure that the UK TDM signalling protocols are fully supported during the transition period when IP networks will coexist with TDM networks.
 - Configuration options to support UK regulatory requirements such as Calling Line Identity (CLI) and emergency call location.
 - End-to-end performance rules and objectives for call quality across the UK telephone system and the performance required from individual networks to achieve these rules and objectives.

⁴⁷⁸ The messages used within and between networks to control call setup and tear-down.

⁴⁷⁹ NICC has been the technical authority for interoperability standards since the introduction of competition in voice services. NICC was originally convened in 1991 as a committee reporting to our predecessor regulator Oftel. In 2006 NICC became an independent organisation owned by telecoms providers and equipment manufacturers.

9.7 Since the 2017 Narrowband Market Review, NICC has published several new IP interconnection standards largely completing its work on IP interconnection standards.⁴⁸⁰

9.8 In our 2019 First Consultation we noted that some stakeholders had raised concerns that a lack of adherence to the NICC standards could pose a risk to the integrity of voice services, particularly during the transition to IP networks. We noted that there had been few problems to date, in part because TDM interconnection is still widely used. However, we considered that, as the transition to IP networks progresses and usage of IP interconnection increases, the risk of problems could increase. A lack of standardisation could potentially give rise to various problems including:

- **Call quality problems** – a range of configuration options affect call quality parameters such as clarity, delay and jitter (variation of delay). Standardisation should ensure that call quality is maintained, particularly for complex call routings across multiple networks where the cumulative effects of such configuration impairments are most pronounced.
- **Impeding development of higher call quality** – IP networks support higher call quality, which is comparable to the call quality that is already supported by 4G mobile networks, and better than the call quality that has traditionally been supported by fixed telephone networks. A lack of standardisation might result in this opportunity to improve call quality being missed.
- **TDM interworking problems** – during the transition period, TDM and IP networks will coexist. IP interconnection will therefore need to fully support the TDM signalling protocols to enable the transition to proceed smoothly and to avoid call failures.
- **Ancillary features** – interconnection signalling supports various ancillary features including calling line identity (CLI) and emergency call location. Standardisation ensures these features operate reliably, in accordance with our regulatory requirements and data protection regulations.
- **Terminal equipment compatibility** – a range of configuration options can affect the operation of terminal equipment such as telecare and security alarms which use voice-band tones to communicate over the telephone network.

9.9 A lack of standardisation could also increase the cost of IP interconnection, as telecoms providers would need to support multiple configurations and potentially deploy hardware (for example for transcoding between voice codec standards).

9.10 Respondents to our 2019 First Consultation acknowledged that there is significant variation in IP interconnection. Most considered that this variability would continue because:

- many operators had deployed IP networks before the international standards and the NICC's UK profiles were finalised;
- IP equipment is supplied by a large global community of vendors, not all of whom support the NICC standards; and
- the international and NICC standards do not specify all configuration parameters.

⁴⁸⁰ These publications include: ND1037 SIP NNI Interworking (IP to TDM interworking) and ND1653 on SIP overload control.

- 9.11 Respondents acknowledged that in theory, this variability could give rise to a risk of consumer harm (as discussed above), however, most considered that such risks could be managed by telecoms providers.
- 9.12 There were differing views about whether any action would be appropriate to mitigate the risk of consumer harm. Some respondents, mostly small telecoms providers, supported Ofcom mandating compliance with the NICC IP interconnection standards. However, most respondents considered that such a prescriptive approach was unnecessary. They emphasised that the industry had put a great deal of effort into developing the NICC standards and that telecoms providers have a strong incentive to manage the risks on a bilateral basis (when establishing interconnection). It was also noted that a practical approach had been adopted with the NICC standards being only as prescriptive as necessary to facilitate interoperability, ensure security and call quality.
- 9.13 There were also concerns that mandating compliance with the NICC standards could lead to delays and impose large unnecessary costs on telecoms providers who deployed IP interconnects before the NICC IP interconnection standards were finalised and who have already effectively mitigated the risks.
- 9.14 Several respondents favoured a lighter-touch approach, suggesting that Ofcom should formally recognise or endorse the NICC IP interconnection standards, while accepting that variation could continue where properly managed.

Our proposals

- 9.15 In our August 2020 Consultation, we proposed that the risks should be manageable by telecoms providers and that a prescriptive approach such as requiring telecoms providers to use the NICC IP interconnection standards would be undesirable as it could cause telecoms providers to reconfigure/replace pre-standardisation IP interconnects which are working reliably.
- 9.16 We noted that there was broad support for the NICC IP interconnection standards amongst respondents and that respondents were looking to us to endorse the standards or otherwise signal that they should be adopted. We therefore proposed to adopt guidance which would apply a presumption that the provision of interconnection for WCT in accordance with the NICC IP interconnection standards would constitute a fair and reasonable term/condition.

Stakeholder responses

- 9.17 BT⁴⁸¹, the FCS⁴⁸², Telecom2⁴⁸³, Virgin Media⁴⁸⁴ and Vodafone⁴⁸⁵ supported our proposal that the risks associated with IP interconnection should be manageable by industry and our proposed guidance concerning the network access obligation and technical standards. Magrathea also supported our proposed guidance.⁴⁸⁶
- 9.18 BT emphasised that mandating the NICC standards could lead to delays and impose large unnecessary costs on telecoms providers who have already deployed IP interconnects and who have effectively mitigated such risks. BT also noted that telecoms providers had put a lot of effort into developing the NICC standards and that telecoms providers have a strong incentive to manage the risks when establishing interconnection.⁴⁸⁷
- 9.19 Vodafone considered that our guidance would ensure that the risks associated with IP interconnection would be manageable by industry because it would make clear that the NICC standards are the default for IP interconnection and that telecoms providers departing from them would bear any additional costs.⁴⁸⁸

Our reasoning and decisions

- 9.20 We note that respondents to our August 2020 Consultation supported our proposals and that there was broad support for the NICC IP interconnection standards amongst respondents to both our 2019 First Consultation and our August 2020 Consultation.
- 9.21 We remain of the view that adoption of the NICC IP interconnection standards will provide the greatest assurance that telephone services will work reliably and of avoiding the problems discussed above.
- 9.22 We agree with respondents that a prescriptive approach such as requiring telecoms providers to use the NICC IP interconnection standards would be undesirable as it could cause telecoms providers to reconfigure/replace pre-standardisation IP interconnects which are working reliably.
- 9.23 We consider that a more proportionate approach is to adopt guidance concerning our interpretation of the network access obligations we are imposing for all telecoms providers which we have been found to have SMP in WCT. In particular, we have decided to adopt guidance, as set out below, which applies a presumption that the provision of interconnection for WCT in accordance with the NICC IP interconnection standards would constitute a fair and reasonable term/condition.

⁴⁸¹ BT response to the August 2020 Consultation, page 24.

⁴⁸² The FCS response to the August 2020 Consultation, response to questions 9.1 and 9.2.

⁴⁸³ Telecom2 response to the August 2020 Consultation, responses to Q9.1 and Q9.2.

⁴⁸⁴ Virgin Media response to the August 2020 Consultation, pages 1-2

⁴⁸⁵ Vodafone response to the August 2020 Consultation, page 33.

⁴⁸⁶ Magrathea response to the August 2020 Consultation, page 7.

⁴⁸⁷ BT response to the August 2020 Consultation, page 24.

⁴⁸⁸ Vodafone response to the August 2020 Consultation, page 33.

Guidance concerning the network access obligation for WCT

When considering whether the Dominant Provider providing WCT has discharged its obligation to provide network access on fair and reasonable terms, conditions and charges, Ofcom will adopt a presumption that the provision of IP interconnection in accordance with the relevant NICC IP interconnection standards is likely to be consistent with those obligations. In view of this, Ofcom will also consider that:

- It is likely to be reasonable for access seekers wishing to use an interface other than the relevant NICC standards for IP interconnection to bear any additional costs associated with the use of that interface, such as media conversion or protocol conversion costs.
- It is likely to be reasonable for a Dominant Provider wishing to use an interface other than the relevant NICC standards for IP interconnection to bear any additional costs associated with the use of that interface, such as media conversion or protocol conversion costs.

9.24 This guidance does not preclude telecoms providers from reaching commercial agreements concerning the technical interfaces to be used for IP interconnection or the recovery of costs.

Security and resilience of telephone services

9.25 Several respondents to our August 2020 Consultation commented about the security and resilience of telephone services, a topic which was not covered in the consultation.

Stakeholder responses

9.26 Gamma⁴⁸⁹, ITSPA⁴⁹⁰, Simwood⁴⁹¹, UKCTA⁴⁹², and another telecoms provider Name Withheld-2⁴⁹³ raised concerns about security and resilience of IP telephone services. The main points were:

- The risks are greater with IP networks because they lack some of the inherent features of TDM networks which promote security and resilience, such as the requirement for private physical interconnects.
- IP technology has significantly reduced the barriers to market entry compared with TDM technology, opening the market to new entrants who may be incentivised to interconnect without due attention to security, resilience and other important factors. Some respondents cited problems with CLI presentation and network outages as evidence that their concerns about smaller less well-resourced operators were not just theoretical.

⁴⁸⁹ [Gamma](#) response to the August 2020 Consultation, paragraphs 18-32.

⁴⁹⁰ [ITSPA](#) response to the August 2020 Consultation, pages 1-3.

⁴⁹¹ [Simwood](#) response to the August 2020 Consultation, pages 17-18.

⁴⁹² [UKCTA](#) response to the August 2020 Consultation, paragraphs 29-33.

⁴⁹³ [Name Withheld-2](#) [redacted] response to the August 2020 Consultation, page 3.

- Telecoms providers might compromise the security of their networks by interconnecting over the internet.
- 9.27 Respondents considered that Ofcom should take steps to ensure that telecoms providers interconnect securely. Several suggestions were made:
- Telecommunications Security Requirements (TSRs) could be implemented under the new telecoms security framework proposed by the Government in the Telecommunications (Security) Bill.
 - Ofcom could amend General Condition A2 (standards and specifications) to require telecoms providers to take account of the NICC standards, effectively giving them the same status as international standards.
 - Ofcom could give guidance that telecoms providers complying with the relevant NICC standards would be likely to have discharged their obligations under Section 105A of the Act to manage risks to the security of public electronic communications networks and public electronic communications services.
 - Telecoms providers could be required to use a secure method of interconnection (private direct interconnects, IP peering at a UK internet exchange, or a private VLAN at a UK internet exchange).
 - Ofcom could modify the network access obligations to limit the availability of WCT and the regulated FTR to secure methods of interconnection (as above).
- 9.28 Gamma⁴⁹⁴ and ITSPA⁴⁹⁵ also suggested that Ofcom should review General Condition A2 on standards and specifications, following the UK's exit from the EU. They considered that Ofcom should amend General Condition A2 to give NICC standards parity with international standards.

Our consideration of respondents' comments

- 9.29 The current regulatory framework for security and resilience of telephone services is specified in:
- General Condition A3 which requires telecoms providers to take all necessary measures to ensure the availability of Publicly Available Telephone Services (PATS) and networks over which PATS are provided and to ensure uninterrupted access to the emergency services.⁴⁹⁶
 - Sections 105A to 105D of the Act which sets out the regulatory regime for security of public electronic communications networks and services. These obligations require telecoms providers to take all appropriate steps to protect, as far as possible, the

⁴⁹⁴ Gamma Response to the August 2020 Consultation, paragraphs 33-42.

⁴⁹⁵ ITSPA Response to the August 2020 Consultation, pages 3-4.

⁴⁹⁶ Ofcom, [General Conditions of Entitlement](#) [Accessed 25 March 2021]

availability of their networks and services and to report significant security breaches to Ofcom. The security obligations are supported by Ofcom guidance.⁴⁹⁷

- 9.30 Respondents' comments about security and resilience of IP telephone services are broadly reflective of the findings of the Government's UK Telecoms Supply Chain Review.⁴⁹⁸ Amongst other things, the review found that telecoms providers face tensions between commercial priorities and their duties to ensure the security and resilience of their networks.
- 9.31 Following the review, the Government proposed to strengthen the regulatory regime for network security and resilience, setting out its proposals in the Telecommunications (Security) Bill which is expected to receive royal assent in Summer 2021.⁴⁹⁹
- 9.32 We consider that the new regulatory regime should address respondents' concerns about the use of insecure means of interconnection and about the need for a more proactive approach to monitoring and enforcement. It will impose strengthened security duties on telecoms providers and will be supported by detailed security obligations specified in secondary legislation (known as Telecommunications Security Requirements) and a code of practice providing guidance on the security measures to be taken by telecoms providers to meet those requirements. Ofcom will also have a new duty to ensure that telecoms providers comply with their obligations and powers to monitor and enforce compliance.
- 9.33 The Telecoms Supply Chain Review also identified a requirement for a greater focus on network resilience. To progress this, Ofcom is:
- working with the Electronic Communications Resilience and Response Group (EC-RRG) to update its resilience guidance⁵⁰⁰;
 - operating an enhanced information collection and analysis scheme for service affecting incidents reported to us by telecoms providers; and
 - developing a resilience assessment framework drawing on the EC-RRG resilience guidance to assist us and telecoms providers with the evaluation of future service-affecting incidents.
- 9.34 In relation to respondents' comments about General Condition A2, Ofcom reviewed its General Conditions and made certain modifications which it considered necessary following the end of the transition period under the EU Withdrawal Agreement.⁵⁰¹ Ofcom's

⁴⁹⁷ Ofcom 2017. [Ofcom guidance on security requirements in sections 105A to D of the Communications Act 2003 2017 version](#). [Accessed 25 March 2021] Amongst other things the guidance specifies that Ofcom expects telecoms providers to keep abreast of the range of security related guidance, best practice and standards that are relevant to their networks and services including security advice from Government agencies such as the [National Centre for Cyber Security](#) (NCSC) and the [Centre for the Protection of National Infrastructure](#) (CPNI), and industry bodies such as [NICC](#) and the [Electronic Communications Resilience & Response Group](#) (EC-RRG). [All accessed 25 March 2021]

⁴⁹⁸ DCMS, [Telecoms Supply Chain Review](#). [Accessed 25 March 2021]

⁴⁹⁹ DCMS, [Telecommunications \(Security\) Bill](#). [Accessed 25 March 2021]

⁵⁰⁰ EC-RRG 2018. [Resilience Guidelines for Providers of Critical National Telecommunications Infrastructure, updated August 2018](#). [Accessed 25 March 2021]

⁵⁰¹ Ofcom 2020. [Implementing the new European Electronic Communications - Code Changes to the General Conditions, Metering and Billing Direction and the National Telephone Numbering Plan](#). The statement included a minor modification to GCA2.2 which comes into effect on 17 December 2021. [Accessed 25 March 2021]

powers and duties under the Act have also been amended as part of the legislative changes implementing the UK's exit from the EU.⁵⁰² General Condition A2, as modified, is in line with Ofcom's duty under sub-sections 4(9) and (10) of the Act as amended.

⁵⁰² See [Electronic Communications and Wireless Telegraphy \(Amendment etc.\) \(EU Exit\) Regulations 2019/246](#); [Electronic Communications and Wireless Telegraphy \(Amendment\) \(European Electronic Communications Code and EU Exit\) Regulations 2020/1419](#). [Accessed 25 March 2021]

10. Termination on the 070 number range

- 10.1 In this chapter, we outline our August 2020 proposals for the market definition and SMP assessment of wholesale call termination services for voice calls to 070 numbers (070 WCT), and relevant remedies, for the market review period. In each part we set out stakeholder comments, and our reasoning and decisions.
- 10.2 We define the relevant market as the wholesale termination services that are provided by a 070 number range holder to another telecoms provider for terminating calls to the 070 numbers within the range it holds. We conclude that each 070 provider has SMP within the relevant market.
- 10.3 We have decided to maintain a charge control for 070 termination rates, which will be set at the same rate as the charge control on termination rates for calls to mobile numbers for this market review period.
- 10.4 The relevant charge controls for the market review period are set out in Table 10.1 below. A full explanation of the 2021 MCT Model, on which the termination rates below are based, can be found in Section 6 and Annex 2.

Table 10.1: Termination rates (real 2021/22 ppm)

	From 1 April 2020	From 1 June 2021	From 1 April 2022	From 1 April 2023	From 1 April 2024	From 1 April 2025
Current	0.468					
Base case		0.379	0.371	0.379	0.387	0.393
X-value			-2.2%	+2.1%	+2.4%	+1.5%

Source: 2021 MCT model, Ofcom

Market Definition and SMP Assessment

Our proposals

Market definition

- 10.5 In our August 2020 Consultation we proposed to define the relevant market as “the provision of WCT by a terminating communications provider to another communications provider, for the termination of voice calls to 070 numbers within the range which has been allocated to that terminating communications provider by Ofcom, for which that terminating communications provider is able to set the termination rate.”
- 10.6 We proposed to define the geographic extent of each market as the area served by that 070 provider. This is because the number of operators in a particular geographic area does not affect the competitive conditions an 070 provider faces since voice termination provided by one provider is not a substitute for termination provided by another.

- 10.7 Finally, we proposed that the market for 070 WCT meets the requirements of the three-criteria test.

Market Power assessment

- 10.8 In our August 2020 Consultation, we proposed that each of the 070 number range holders had SMP in the corresponding relevant market.

Stakeholder responses

- 10.9 BT⁵⁰³, FCS⁵⁰⁴, Gamma⁵⁰⁵, Magrathea⁵⁰⁶, Telecom2⁵⁰⁷, Telefónica⁵⁰⁸ and Vodafone⁵⁰⁹ all agreed with our proposed market definition and SMP assessment.

Our reasoning and decisions

Market definition

- 10.10 For the reasons set out below, we have decided to confirm our August 2020 proposals on the definition of the relevant market, and on whether the 070 WCT market meets the three criteria test. Accordingly, we define the relevant market for 070 WCT is the provision of WCT by a terminating communications provider to another communications provider, for the termination of voice calls to 070 numbers within the range which has been allocated to that terminating communications provider by Ofcom, for which that terminating communications provider is able to set the termination rate.
- 10.11 We reviewed the market for 070 termination in October 2018 (the 2018 070 Market Review Statement).⁵¹⁰ The charge control that we set as a result of the 2018 070 Market Review Statement came into effect on 1 October 2019. At the time of the publication of this statement, only a year and a half had elapsed since this intervention. As such, and as we did in our August 2020 Consultation, we still consider it appropriate to draw from the findings of the 2018 070 Market Review Statement to reach our proposed market definition and SMP determinations.
- 10.12 In our August 2020 Consultation, we took the provision of WCT for voice calls to an individual 070 number as our focal product and considered whether a SSNIP would be profitable for a hypothetical monopolist. A SSNIP could be rendered unprofitable if it would cause high levels of demand-side substitution or supply-side substitution.⁵¹¹

⁵⁰³ BT response to the August 2020 Consultation, page 27.

⁵⁰⁴ FCS response to the August 2020 Consultation, page 6.

⁵⁰⁵ Gamma response to the August 2020 Consultation, page 14, paragraph 66.

⁵⁰⁶ Magrathea response to the August 2020 Consultation, page 8.

⁵⁰⁷ Telecom2 response to the August 2020 Consultation, page 8.

⁵⁰⁸ Telefónica response to the August 2020 Consultation, page 8.

⁵⁰⁹ Vodafone response to the August 2020 Consultation, page 33.

⁵¹⁰ Ofcom, 2018. *Personal Numbering – Review of the 070 number range: Final Statement* [Accessed 25 March 2021]

⁵¹¹ As we explained in Section 5 of this document, the purpose of a voice call is to contact a specific person, business or organisation. Therefore, the opportunities for demand-side substitution at the retail level are limited to alternative

10.13 We said we were not satisfied that there are sufficient opportunities for demand-side substitution at the retail level. For a SSNIP to be rendered unprofitable by callers switching to alternative methods of contacting a specific intended recipient, it would require callers to be aware of the price increase. However, survey evidence suggests that customers have a very low awareness of 070 numbers and the retail prices for calling them.⁵¹²

10.14 At the wholesale level, we said that there was a lack of direct constraints on 070 termination charges from the demand-side or supply-side of the market:

- There are no opportunities for demand-side substitution because, once a caller calls a 070 number, the caller's provider has no alternative other than to purchase 070 termination on that number.
- Supply-side substitution is not a relevant constraint since the only telecoms provider that can supply termination to a given 070 number is the 070 provider to which that number has been allocated. In other words, no third-party provider can begin to terminate calls to a given 070 number in response to a SSNIP on the WCT charge for that number.
- We said that the absence of demand-side and supply-side substitutability suggested that a separate market should be defined for the provision of WCT to each 070 number. As this would lead to a very large number of markets, we considered it pragmatic to aggregate these markets by terminating provider. This is reasonable because the numbers within the range allocated to each 070 provider face similar competitive conditions.

10.15 In carrying out our assessment, we had regard to the EC SMP Guidelines. We consider that our analysis in our August 2020 Consultation remains appropriate. In addition, stakeholders that responded

10.16 We also proposed that the market for 070 WCT meets the requirements of the three-criteria test because:

- **There was a presence of high and non-transitory barriers to entry** since each 070 provider has a monopoly over the provision of termination on the 070 numbers which they hold.
- **The market structure did not tend towards effective competition.** In 2018, termination rates for 070 numbers had remained consistently high over the years, despite falling input costs, because end users have little to no incentive to drive rates down.⁵¹³ In our August 2020 Consultation, our preliminary finding was that although termination rates for 070 numbers had fallen in response to our charge control, we did not regard this as evidence of a market structure tending towards effective competition. End users still do not have incentives to drive down 070 WCT rates as they

methods of contacting that specific intended recipient. At the wholesale level, supply-side substitution could occur if competitors were able to offer call termination to the particular number called.

⁵¹² A study by Futuresight in December 2018 found lack of awareness and uncertainty existed for certain numbers, and that awareness in general of the cost of calls to certain numbers was low. Ofcom, 2018. [The future of telephone numbering: qualitative research study](#) (by Futuresight), page 22. [Accessed 25 March 2021]

⁵¹³ August 2020 Consultation, paragraph 10.15, and the 2018 070 Market Review Statement, paragraph 3.101

lack alternatives and tend not to be aware of 070 call charges.⁵¹⁴ Accordingly, we expected that termination rates would revert to their previous excessive levels in the review period, absent a charge control.

- **Competition law alone would not adequately address the market failures.** We said that barriers to entry in this market will persist so that relevant markets will not tend towards competition within five years. We considered that, because of the high barriers of entry, intervention based on competition law would not provide a sufficiently swift and effective remedy for the harms stemming from high prices, such as fraud.⁵¹⁵

10.17 Therefore, we are satisfied that 070 WCT markets meet the three criteria test in section 79(2B) of the Act. We are also satisfied that these are markets in relation to which it is appropriate to consider whether to make a market power determination. Our reasons are set out above and are based on projections over a five-year period.

Market Power Assessment

10.18 For the reasons set out below and having decided that it is appropriate to make a market power determination in relation to the 070 WCT markets, we have determined that each 070 provider has SMP within the relevant market:⁵¹⁶

- Each provider has a monopoly in respect to the provision of WCT on their 070 numbers.
- There were high and non-transitory barriers to entry, as a third-party telecoms provider can only enter the market if an existing 070 provider allows them access to their number range, which they are unlikely to do.
- We considered it unlikely that, in the absence of our cap, countervailing buyer power (CBP) would emerge to negotiate rates down. In principle, a retail telecoms provider could attempt to exert CBP by threatening to block calls to 070 numbers. However, we considered that retail telecoms providers have few incentives to block 070 calls. Moreover, in practice we found in our 2018 070 Market Review Statement that 070 providers set the same termination rates across retail telecoms providers.⁵¹⁷ This is consistent with retail telecoms providers having the same (very limited) ability to exert CBP.
- Before the charge control on 070 termination came into effect, there was evidence of pricing above competitive levels: the average termination rate for UK originating calls to 070 number was 38.84ppm⁵¹⁸, which was substantially higher than the incremental cost of providing the service at 1.093ppm⁵¹⁹. We would expect termination rates to revert to their previous excessive levels absent a charge control.

⁵¹⁴ August 2020 Consultation, paragraph 10.15, and the 2018 070 Market Review Statement, paragraph 3.101

⁵¹⁵ August 2020 Consultation, paragraph 10.15 and 2018 070 Market Review Statement, paragraph 3.104

⁵¹⁶ In making our assessment, we have had regard to the EC SMP Guidelines.

⁵¹⁷ 2018 070 Market Review Statement, paragraph 3.81

⁵¹⁸ 2018 070 Market Review Statement, paragraph 3.83

⁵¹⁹ 2018 070 Market Review Statement, paragraph A4.49

- 10.19 In addition, prior to our price cap, we found that there were material levels of consumer harm resulting from fraud by 070 providers, which we believed had been incentivised by the high termination rates.⁵²⁰ After we introduced our price cap, we found that that incidences of fraud had fallen.⁵²¹ However, given that we would expect termination rates to rise excessively in absence of the charge control, we considered that the risk of fraud would also re-emerge.
- 10.20 Finally, stakeholders were also supportive of our proposed assessment of market power.

Remedies

- 10.21 In the following paragraphs, we consider the *ex ante* regulation that is appropriate and proportionate in view of our SMP determinations.

Our proposals

- 10.22 In our August 2020 Consultation, we said that there continued to be a material risk of harm as a result of the potential for telecoms providers with SMP in the markets for 070 termination to set high termination charges. We proposed to address this by means of a charge control on 070 termination rates, to be set at the same rate as the charge control for the MTR.

Stakeholder responses

- 10.23 Magrathea⁵²², Telefónica⁵²³, Vodafone⁵²⁴, FCS⁵²⁵, Virgin Media⁵²⁶ and BT⁵²⁷ agreed with our proposal to set a charge control on 070 termination rates. Several stakeholders suggested additional remedies.⁵²⁸ Telecom2 disagreed with our proposal to continue to impose a charge control on 070 numbers.⁵²⁹

Excessive retail prices for calls to 070 numbers and bill shock for customers

- 10.24 Telecom2⁵³⁰, Magrathea⁵³¹, Gamma⁵³² and Telefónica⁵³³ said that 070 retail rates remain high despite the significant reduction in wholesale rates. Magrathea suggested that Ofcom

⁵²⁰ 2018 080 Market Review Statement, paragraphs 4.21 to 4.24

⁵²¹ August 2020 Consultation, paragraph 10.37

⁵²² Magrathea response to the August 2020 Consultation, page 8.

⁵²³ Telefónica response to the August 2020 Consultation, page 3.

⁵²⁴ Vodafone response to the August 2020 Consultation, page 33.

⁵²⁵ FCS response to the August 2020 Consultation, page 6.

⁵²⁶ [Virgin Media](#) response to the August 2020 Consultation, page 3.

⁵²⁷ BT response to the August 2020 Consultation, page 27.

⁵²⁸ Magrathea response to the August 2020 Consultation, page 8; Gamma response to the August 2020 Consultation, pages 14 to 15; Telefónica response to the August 2020 Consultation, pages 3 and 9.

⁵²⁹ Telecom2 response to the August 2020 Consultation, pages 8 to 11.

⁵³⁰ Telecom2 response to the August 2020 Consultation, pages 8 to 10.

⁵³¹ Magrathea response to the August 2020 Consultation, page 8.

⁵³² Gamma response to the August 2020 Consultation, pages 14 to 15.

⁵³³ Telefónica response to the August 2020 Consultation.

undertake an investigation into this issue⁵³⁴, and Gamma suggested that Ofcom use its retail price setting powers to bring 070 calls within call allowances.⁵³⁵

- 10.25 Telefónica suggested that Ofcom make the 070 number range available to mobile users if legitimate use of the number range remains low.⁵³⁶
- 10.26 Telecom2 thought that providers of origination on the 070 number range had SMP and that this was a source of excessive pricing and bill shock in the retail market.⁵³⁷
- 10.27 Telecom2 questioned the accuracy of some of the data on retail rates presented in Table 10.2 of our August 2020 Consultation, providing some alternative figures.⁵³⁸

Fraud and Artificial Inflation of Traffic (AIT)

- 10.28 Telecom2 argued that Ofcom’s analysis in the 2018 070 Market Review Statement was based on an overstatement of artificial inflation of traffic⁵³⁹ by BT, and that the proposals in our August 2020 Consultation were therefore also based on “spurious allegations”.⁵⁴⁰ Telecom2 argued that most artificial inflation of traffic cases put forward by BT breached the Standard Interconnect Agreement and were challenged by other telecoms providers.

Setting the level of the proposed charge control

- 10.29 Of those stakeholders that agreed with our proposal to set a charge control on 070 termination rates, all agreed or made no comment on our proposal to continue to set the charge control at the same level as mobile termination rates at the present time.

Our reasoning and decisions

- 10.30 For the reasons set out below, we have decided to impose a charge control on 070 termination rates, to be set at the same rate as the charge control for mobile termination rates.

Excessive retail prices for calls to 070 numbers and bill shock for customers

- 10.31 Although we recognise that the pass through of lower termination rates to retail prices has been uneven, we consider that our decision in 2018 to impose a charge control on 070 termination rates resulted in some lowering of retail 070 prices. Therefore, absent a charge control, there would be an increased risk of bill shock for consumers.

⁵³⁴ Magrathea response to the August 2020 Consultation, page 8.

⁵³⁵ Gamma response to the August 2020 Consultation, pages 14 to 15.

⁵³⁶ Telefónica response to the August 2020 Consultation, pages 3 and 9.

⁵³⁷ Telecom2 response to the August 2020 Consultation, page 8.

⁵³⁸ Telecom2 response to the August 2020 Consultation, pages 9 to 10.

⁵³⁹ Artificial Inflation of Traffic (AIT) is telephony traffic which has no legitimate commercial purpose; where an activity causes calls to a service to be artificially generated or prolonged for financial benefit, and where the calling pattern would not have happened in the normal course of business.

⁵⁴⁰ Telecom2 response to the August 2020 Consultation, pages 10 to 11.

- 10.32 Prior to the implementation of the charge control on 070 termination, high termination rates for 070 calls resulted in high retail call prices (compared to prices for calls to geographic numbers, mobile numbers, and many international calls) and their exclusion from call allowances. As a result of the very low consumer awareness of 070 numbers and the high retail charges for calling them, customers experienced bill shock when they were presented with unexpectedly high charges.⁵⁴¹
- 10.33 Following the implementation of the charge control in October 2019, there is evidence of price reductions in the retail rates for 070 numbers in comparison to the 2018 rates (before the implementation of the charge control). There is also evidence that providers are more likely to include calls to 070 numbers in call allowances compared to 2018. In our August 2020 Consultation, we said that this suggested that the introduction of the cap on 070 termination rates has had some impact in reducing the incentive for telecoms providers to charge high retail prices for 070 calls.⁵⁴²
- 10.34 Figure 10.2 below sets out the retail call prices charged by some fixed and mobile providers for calls to 070 numbers in 2018 and in November 2020 (13 months after the charge control came into effect). Figure 10.2 also outlines whether 070 calls are included in call allowances by each provider as of November 2020. Prior to the implementation of the charge control, none of the providers below included calls to 070 numbers in their call allowances.

Figure 10.2: Maximum retail call prices for 070 (including VAT) (ppm)⁵⁴³

Included in call allowance?		Maximum price of out of allowance calls (ppm) (SAS: same as standard)					
		Mobile pay monthly		Mobile pay as you go		Fixed	
		2018	2020	2018	2020	2018	2020
O2 ⁵⁴⁴	Yes	55	55 (SAS)	66	66	-	-
Vodafone ⁵⁴⁵	No	55	55 (SAS)	45	45	-	-
EE ⁵⁴⁶	No	75	5	75	5	59	5
Three ⁵⁴⁷	No	104	104	104	104	-	-

⁵⁴¹ 2018 070 Market Review Statement, paragraphs 4.10 to 4.13.

⁵⁴² August 2020 Consultation, paragraphs 10.29 to 10.33.

⁵⁴³ In its response to the August 2020 Consultation, Telecom2 questioned the accuracy of the retail rate data presented in a table similar to Figure 10.2. We have no reason to believe that the price data taken from providers' websites and recorded in the August 2020 Consultation was inaccurate. We consider that any disparities between Ofcom's data and that presented by Telecom2 may be the result of price changes or merely a reflection of the variety of pricing plans. We note that the findings presented by Telecom2 were in any case not substantively different from our own findings and do not alter our findings about the impact of the charge control on retail prices for 070 calls. We have updated the table for the statement based on data found in November 2020.

⁵⁴⁴ O2, 2021. [Charges on your bill](#) [Accessed 22 March 2021].

⁵⁴⁵ Vodafone, 2021. [Call charges for UK numbers](#) [Accessed 22 March 2021].

⁵⁴⁶ EE, 2021. [EE Broadband, TV and Home Phone Charges](#) [Accessed 22 March 2021].

⁵⁴⁷ Three, 2021. [Calling Special Numbers](#) [Accessed 22 March 2021].

Giffgaff ⁵⁴⁸	Yes	-	25 (SAS)	50	25 (SAS)	-	-
Virgin Media	No	75	75 ⁵⁴⁹	75	75 ⁵⁵⁰	51.07	51.07 ⁵⁵¹
Plusnet Mobile ⁵⁵²	Yes	76.6	40 (SAS)	-	-	-	-
Sky	No	110	55 ⁵⁵³	-	-	50.88	50.88 ⁵⁵⁴
BT ⁵⁵⁵	No	-	91.9	-	91.9	48.51	5 (SAS)
TalkTalk ⁵⁵⁶	No	-	50 (SAS)	-	50 (SAS)	50.88	50.88

Note: Some telecoms providers also charge a per call charge, on top of the ppm charge. For example, Three charges £1.22 per call plus 85.5ppm for certain 070 numbers.

- 10.35 The table shows that three out of the ten providers we looked into include 070 calls in call allowances. Of the remaining seven providers, five either price 070 calls at the same rate as out of allowance calls to mobiles in at least one call plan or have reduced the charge for 070 calls in at least one call plan since 2018. This data is indicative of a developing trend towards aligning 070 and mobile call prices and suggest that the introduction of the cap on 070 termination rates is having some impact in reducing the incentive for telecoms providers to charge high retail prices for 070 calls.
- 10.36 However, we recognise that some large mobile providers have not reduced their 070 prices nor included them in call allowances. This presents an ongoing risk of bill shock to customers.⁵⁵⁷
- 10.37 As part of the Future of Telephone Numbers review⁵⁵⁸ we have identified the need to clarify revenue sharing rules⁵⁵⁹ that will provide further mitigation for telecoms providers against the risk of high volumes of artificial inflation of traffic on 070 numbers, and therefore support the inclusion of 070 numbers in call allowances. Ofcom plans to consult shortly on the proposals.

⁵⁴⁸ Giffgaff, 2021. [UK Prices](#) [Accessed 22 March 2021].

⁵⁴⁹ Virgin Media, 2021. [Pay Monthly & SIM Only](#) [Accessed 22 March 2021].

⁵⁵⁰ Virgin Media, 2021. [Pay As You Go call charges](#) [Accessed 22 March 2021].

⁵⁵¹ Virgin Media, 2021. [Home phone packages](#) [Accessed 22 March 2021].

⁵⁵² Plusnet, 2021. [Plusnet Mobile price guide](#) [Accessed 22 March 2021].

⁵⁵³ Sky, 2020. [Sky Mobile Tariff Guide](#) [Accessed 22 March 2021].

⁵⁵⁴ Sky, 2021. [Sky Talk Tariff Guide](#) [Accessed 22 March 2021].

⁵⁵⁵ BT, 2021. [BT Consumer Price Guide](#) [Accessed 22 March 2021].

⁵⁵⁶ TalkTalk, 2021. [Charges on your bill](#) [Accessed 22 March 2021].

⁵⁵⁷ August 2020 Consultation, paragraph 10.32.

⁵⁵⁸ Ofcom, 2019. [Future of telephone numbers: First consultation](#). [Accessed 25 March 2021]

⁵⁵⁹ Paragraph B3.4.1 of the current Numbering Plan sets out the restrictions on revenue sharing applicable to the 070 number range as follows: "Those Adopting Personal Numbers shall not share with any End-User any revenue obtained from providing a Personal Numbering Service." 2021, Ofcom. [The National Telephone Numbering Plan](#), page 17. Confusion may exist as in many circumstances the term 'end-user' is associated with the called party and not the calling party. We intend to clarify that revenue sharing with calling parties is not permitted. [Accessed 25 March 2021]

- 10.38 In response to Gamma’s suggestion to use our price setting powers to bring 070 calls within call allowances, such a remedy is outside the scope of this review. We expect that competition between retailers⁵⁶⁰ should eventually result in more pass through of lower termination prices into retail call prices the longer the charge control is in place and the longer the risk of high costs for retail providers in connecting 070 numbers stays low. However, if retail rates remain high notwithstanding our intervention, we will consider whether further action may be appropriate.
- 10.39 We also consider Telefónica’s suggestion that Ofcom make the 070 number range available to mobile users to be outside the scope of this review. However, Ofcom will continue to monitor demand for 070 numbers and, if appropriate, consider any proposals for a change of service designation in the National Telephone Numbering Plan as part of our responsibilities in administering the UK’s telephone numbers.
- 10.40 We have no evidence to support Telecom2’s point that SMP in 070 call origination may contribute to excessive retail prices and bill shock. In this market review, we have found that it is the providers which terminate calls on 070 numbers which have SMP and so have been able to charge high termination rates, leading to high retail prices for these calls.

Distorted choice between using 070 and other services

- 10.41 We remain of the view that by keeping termination rates low, the charge control will address the potential distortion in choice between 070 and other services.
- 10.42 We explained in our August 2020 Consultation that, as a result of high termination charges, 070 providers were able to offer services free to the customer on the number range and still make a high rate of return from the amount paid by the caller of the 070 number. This may have resulted in a higher usage of 070 numbers than necessary to meet the needs of end users, while increasing the overall costs to customers due to higher call volumes to these numbers and the high retail prices.
- 10.43 There is evidence that there has been a 90% drop in call volumes to 070 numbers between Q4 2018 (before the introduction of the charge control) and Q4 2019 (after the introduction of the charge control).⁵⁶¹ As a result of the reduction in termination rates, providers may have withdrawn the availability to customers of free services on 070 numbers, who in turn may have switched to other means of receiving calls on the move, thereby correcting the distortion in choice between 070 and other services. In our August 2020 Consultation we considered that to the extent this correction has occurred, it is dependent on the cap remaining in place and keeping 070 termination rates low.
- 10.44 We received no comments from stakeholders on this point.

⁵⁶⁰ There are many providers of retail voice services in the UK, including four MNO’s and numerous MVNO’s and fixed providers.

⁵⁶¹ Based on information provided by BT in relation to call volume data between Q4 2018 and Q4 2019. BT’s response dated 19 February 2021 to the s.135 notice titled *Requests for confirmation of information* provided dated 9 February 2021, page 5.

Fraud and artificial inflation of traffic

- 10.45 We continue to consider that there is a significant risk of fraud on the 070 number range in the absence of a charge control on termination rates.
- 10.46 As set out in the 2018 070 Market Review Statement, and discussed in our August 2020 Consultation, there had been a high incidence of reported fraud associated with the 070 range.⁵⁶² High termination rates and low consumer awareness of the 070 range provided an opportunity to earn profits from the fraudulent use of 070 numbers; for example, by tricking customers into calling a 070 number to generate revenues from termination.⁵⁶³ A charge control reduces the termination rate and diminishes this incentive.
- 10.47 As with fraud more generally, lower termination rates also diminish the incentive for artificial inflation of traffic. Indeed, as noted, there is evidence that call volumes to 070 numbers have fallen dramatically since the implementation of the charge control, and this may indicate a reduction in artificial inflation of traffic.⁵⁶⁴
- 10.48 In relation to Telecom2's contention that artificial inflation of traffic on the 070 range has been overstated by BT and that statements about fraud on the range are therefore based on spurious allegations, while we have not undertaken an exercise to determine whether artificial inflation of traffic has been overstated on the 070 number range, artificial inflation of traffic is only one type of fraudulent activity that takes place. There is other data which supports the finding that there were high levels of fraud and misuse on the range (aside from artificial inflation of traffic) and that this has reduced following implementation of the charge control. We therefore remain of the view that there is a material risk of consumer harm as a result of fraud on the 070 number range if the charge control were to be removed.
- 10.49 In addition, data collected by BICS's FraudGuard platform, which crowdsources and anonymises intelligence from over 900 service providers, reveals that fraud on the 070 number range decreased by 75% between October 2019 (when the charge control came into effect) and September 2020.⁵⁶⁵ This is equivalent to 10 million fewer fraudulent calls in the space of a year. We consider that this data is consistent with BT's data about levels of Artificial Inflation of Traffic on the 070 range.
- 10.50 Finally, we consider that the reduction in complaints provides an indication that the charge control on 070 termination rates is effective in reducing the risk of fraud on the number range. In our August 2020 Consultation we noted that, in the time between the introduction of the charge control in October 2019 and the publication of our August 2020

⁵⁶² 2018 070 Market Review Statement, paragraph 4.24.

⁵⁶³ Another example relates to international calls. Prior to the implementation of the charge control on 070 termination, the retail call price charged by some international telecoms providers was below 070 termination charges because they failed to distinguish between 070 calls and calls to UK mobiles on the 07x mobile number ranges. This meant that fraudulent users were able to generate revenues by sending high volumes of call traffic, via these providers, to their own numbers.

⁵⁶⁴ August 2020 Consultation, paragraphs 10.38 to 10.40.

⁵⁶⁵ BICS is a telecommunications provider that provides wholesale carrier services to telecoms providers globally. BICS, October 2020. [Fraudulent calls plummet in wake of Ofcom regulation, BICS' data shows](#) [Accessed 25 March 2021]

Consultation, Ofcom only received one complaint relating to 070 numbers (and this complaint was not connected with a fraudulent use of the number). This compares with 88 complaints in relation to misuse of 070 numbers that we received between January 2013 and July 2018.⁵⁶⁶ Ofcom received no complaints relating to 070 numbers in the time between the publication of our August 2020 Consultation and the publication of this statement.

Setting the level of the charge control

- 10.51 We have decided to set the charge control on 070 termination rates at the same rate as the price cap on mobile termination rates.
- 10.52 Evidence from market research set out in our 2018 070 Market Review Statement shows that the expectation of the caller is such that when calling a 070 number, they often believe they are calling a mobile number (i.e. another '07 number'). Accordingly, we consider that the MTR is more closely aligned with customer expectations about the cost of a 070 call and is therefore the most appropriate level at which to set the 070 termination rate.
- 10.53 In addition, we consider that tying 070 termination rates to mobile termination rates could increase the incentive for telecoms providers to include 070 calls in call allowances and/or reduce 070 charges to a similar level as mobile charges. Our review of 070 retail rates indicates that this has started to occur, following the implementation of the charge control in October 2019.
- 10.54 A charge control at the same level as the MTR also prevents 070 termination rates being set at an excessive level, reducing the incentive for the misuse of 070 numbers through fraud or artificial inflation of traffic, as described above.
- 10.55 Capping 070 termination charges at the MTR means that the termination rate is less than the overall costs of providing a 070 service in some cases, taking account of onward network routing costs. However, it is possible to recover some of these costs from 070 end users, so that both the caller and the end user of the 070 service contribute to the cost of making calls to the range. This will enable both parties to consider whether a 070 number is the most appropriate and will reduce distortions in the use of the 070 range.
- 10.56 As noted in Section 6, some stakeholders have said that the UK should apply to the European Commission to be listed in the Annex to the Delegated Act. Calls to 070 numbers would fall within the scope of any such application given the SMP findings we have made in respect of 070 termination.⁵⁶⁷ Accordingly, in order to be included on the Annex list, it may be necessary to set the termination rate for 070 calls in line with the FTR, since this reflects a cost-oriented charge for the termination of calls on a fixed network. The FTR that we have set for 2021 – 2026 is lower than the MTR and therefore any such termination rate for 070 calls would address the harms we have identified as arising from SMP in 070

⁵⁶⁶ 2018 070 Market Review Statement, paragraph 4.13.

⁵⁶⁷ Article 2(1)(b) of the Delegated Act.

termination. Therefore, in the event that the UK decides to proceed with an application to the EC, we may need to revisit the question of the appropriate charge control for 070 calls.

10.57 As matters stand however, we remain of the view that the MTR is the appropriate level for the charge control for 070 termination for the reasons set out above.

10.58 We therefore consider that a charge control set at the level of the MTR is the appropriate and proportionate remedy in the 070 termination markets. To allow providers time to notify changes to their 070 termination rates, the current 070 charge control will continue until 31 May 2021 when it will be replaced with the new charge control, which will apply for the remainder of the review period.

11. Donor Conveyance Charge

- 11.1 Mobile number portability enables customers, if they so wish, to retain their telephone number when they switch from one mobile provider to another.
- 11.2 The Donor Conveyance Charge (DCC) is a charge made by the holder of a mobile telephone number (the Donor Provider) for passing a call to another provider (the Recipient Provider), where that number has been ported under the number portability rules to the Recipient Provider. Since 2014, it has been subject to a price cap which has been set at cost.
- 11.3 In this section, we outline the regulatory background of DCCs, followed by our proposals in our August 2020 Consultation and subsequent stakeholder responses. We then set out our final decision in relation to DCCs.

Background

Regulatory obligations

- 11.4 As we set out in our August 2020 Consultation, number portability is an important facilitator of consumer choice and effective competition in electronic communications markets. In order to minimise obstacles to number portability, mobile providers are currently required to set DCCs in accordance with their obligations in General Condition B3.6 (GC B3.6)⁵⁶⁸ and a direction we made in 2018, which we explain below.
- 11.5 GC B3.6 requires operators to provide portability on reasonable terms. This condition also requires that any charges for the provision of portability shall be reasonable, cost-oriented and based on the incremental costs of providing portability, unless the Donor Provider and Recipient Provider have agreed another basis for the charges, or Ofcom has made a direction under GC B3.6(a)(ii) that another basis for charges should be used.

DCC charge control

- 11.6 In 2014, Ofcom gave a direction setting a price cap on the DCC (the 2014 Direction).⁵⁶⁹ The purpose of this direction was to resolve disputes between providers regarding the level of the DCC, and to ensure that DCCs were cost-orientated. The price cap set in the 2014 Direction was modelled on a LRIC+ standard and capped the DCC at 0.028ppm. Following a review in 2015⁵⁷⁰, the 2014 Direction was withdrawn, and a new direction was made (the

⁵⁶⁸ GC B3 (“number portability”) of the [General Conditions of Entitlement](#) sets out the rules which communications providers must follow when customers request to take their landline or mobile number(s) with them when changing provider. [Accessed 24 March 2021]

⁵⁶⁹ This direction was made pursuant to GC 18(a)(ii) which was renumbered to GC B3.6(a)(ii). Ofcom, 2014. [Review of mobile donor conveyance charges](#) [Accessed on 24 March 2021]

⁵⁷⁰ Ofcom, 2015. [Review of Donor Conveyance Charges for the period 2015-2018](#) [Accessed on 24 March 2021]

2015 Direction) which set a price cap, based on a LRIC standard, of 0.023ppm for 2015/16 and 2016/17, reducing to 0.022ppm for 2017/18.

- 11.7 In March 2018, after the 2015 Direction expired, we gave a further direction (the 2018 Direction) setting a price cap of 0.022ppm for 2018/19 which reduced to 0.021ppm for 2019/20 and 2020/21.⁵⁷¹ The 2018 Direction will cease to have effect on 31 March 2021.

DCC revenues and relevant costs

- 11.8 As a result of the price cap, DCC revenues have fallen significantly. We estimate that in 2013/2014, prior to the introduction of the price cap, DCC revenues were roughly £12m⁵⁷², representing around 0.08% of total UK retail mobile revenues.⁵⁷³ However, by 2016/17, total DCC revenues had fallen to around £3.4m⁵⁷⁴, representing 0.02%⁵⁷⁵ of total UK retail mobile revenues.⁵⁷⁶
- 11.9 The cost of providing donor conveyance has fallen over time. The decrease in operational costs is reflected in the reduction in the DCC price cap since 2014. Although ported calls account for only a small proportion of the total UK mobile revenues, porting and the volume of ported calls remain important. The majority of customers who switch provider port their number each year – 76% in 2020⁵⁷⁷ up from 57% in 2017.⁵⁷⁸ The total volume of mobile calls in the year to Q3 2020 was 183 billion minutes, of which a significant proportion will be to ported numbers.⁵⁷⁹

Our Proposals

- 11.10 In our August 2020 Consultation, we proposed that a price cap on DCCs was no longer necessary and should not be renewed for the following reasons:
- Providers remain subject to GC B3.6, which requires them to set DCCs that are reasonable, cost-oriented and based on the incremental cost of providing number portability.⁵⁸⁰

⁵⁷¹ Ofcom, 2018. [Review of Donor Conveyance Charges for the period 2018-2021](#) [Accessed on 24 March 2021]

⁵⁷² Based on revenue figures collected from mobile providers using our formal information gathering powers, the total volumes of DCC calls for 2013/2014 were 12,005 million minutes and the DCC was on average 0.1ppm.

⁵⁷³ The total UK mobile retail revenues in 2013 were £15,559 million. Ofcom, 2014. [Telecommunications market data tables Q4 2013](#), CSV file, Mobile Table 1. [Accessed on 24 March 2021]

⁵⁷⁴ Based on revenue figures collected from mobile providers using our formal information gathering powers, the total volumes of DCC calls for 2016/17 were 14.76 billion minutes and the DCC was on average 0.023 ppm.

⁵⁷⁵ The total UK mobile retail revenues in 2016 were £15.335 billion. Ofcom, 2017. [Telecommunications market tables Q4 2016](#), CSV file, Mobile Table 1. [Accessed 24 March 2021]

⁵⁷⁶ We do not hold more recent data in respect of DCC revenues but do not expect them to be higher than the 2016/17 figures, given that the cap has been lower since then.

⁵⁷⁷ Ofcom, 2020. [Switching experience tracker 2020](#), page 616, table 124. [Accessed 24 March 2021]

⁵⁷⁸ Ofcom, 2017. [Switching experience tracker 2017](#), page 336, table 88. [Accessed 24 March 2021]

⁵⁷⁹ Ofcom, 2020. [Telecommunications Market Data Update Q3 2020](#), CSV file, Mobile Table 2.

⁵⁸⁰ See GC B3.6.

- The current level of the price cap provides a reasonable upper bound benchmark for a cost-orientated charge. In our 2018 cost modelling exercise⁵⁸¹ we established that a cost-orientated charge should be no more than 0.021ppm. Our modelling of costs for the period 2014 to 2021 showed that the cost of providing number portability is falling. In that context we consider it would be difficult for a provider to set DCCs in excess of 0.021ppm and demonstrate that such charges are cost-oriented.
- Revenues from DCCs are significantly lower than they were prior to the introduction of the price cap in 2014 and therefore we do not expect changes to DCCs to have an adverse impact on competition or customers.
- Small changes in DCCs are unlikely to have a significant impact on competition or customers given revenues from DCCs have fallen significantly since we introduced a price cap in 2014.

Stakeholder responses

- 11.11 We received 4 responses to our August 2020 consultation that specifically addressed our proposal to not renew the DCC price cap.
- 11.12 Vodafone⁵⁸² and BT⁵⁸³ agreed with our proposal.
- 11.13 [S] and Telecom2⁵⁸⁴ were concerned that removing the price cap could lead to attempts to increase the price of the DCC.
- 11.14 Telecom2 also expressed concern about Ofcom's ability to address disputes under section 185 of the Act.⁵⁸⁵

Our reasoning and decisions

- 11.15 In relation to [S] and Telecom2's comments, we are satisfied that GC B3.6 will ensure that DCCs remain at or below the current level of the charge control. Our modelling of the costs of providing number portability for the period 2014 – 2021 revealed that they are on a downward trend and we have no grounds for believing that this is likely to change during this review period. Accordingly, we do not expect that DCCs will increase above the current charge control because of the requirement under GC B3.6 that such charges are reasonable and cost-oriented.
- 11.16 In relation to Telecom2's comments about the ability to bring a dispute to Ofcom under section 185 of the Act, a dispute about whether a DCC satisfies the requirements of GC B3.6 is a matter falling within the scope of section 185(2) of the Act, engaging Ofcom's powers and duties in relation to handling and determining disputes in accordance with

⁵⁸¹ Our most recent modelling was undertaken as part of the 2018 DCC review, when the 2015 model was renewed with updated data. However, due to Covid-19 we have not acquired data which could have been used to update the 2018 model.

⁵⁸² [Vodafone](#) response to the August 2020 Consultation, page 33.

⁵⁸³ [BT](#) response to the August 2020 Consultation, page 28.

⁵⁸⁴ [Telecom2](#) response to the August 2020 Consultation, page 11.

⁵⁸⁵ [Telecom2](#) response to the August 2020 Consultation, page 11.

sections 185 – 191 of the Act. Further, where Ofcom has grounds to believe that a telecoms provider is not complying with its obligations under the General Conditions, it is able to take enforcement action under section 96A – 96C of the Act. We are therefore satisfied that our enforcement powers (including our powers to resolve dispute) are sufficient to ensure that providers set DCCs in compliance with GC B3.6.

- 11.17 In light of our consideration that GC B3.6 and the enforcement mechanisms in place will be sufficient to keep DCCs low, we regard the burden of a further cost modelling exercise, that would be needed to set a specific price cap, as disproportionate given the limited benefits in terms of clarity and accuracy that it would achieve.
- 11.18 For the reasons above, we considered our proposal was consistent with our duties under section 3 and 4 of the Act. We have also had regard, as required by section 3(3) of the Act, to the principle that regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed, and to other principles of best regulatory practice.
- 11.19 Therefore, having taken account of stakeholders' responses to our proposals, we remain satisfied that we should not renew the current price cap on DCCs for the reasons set out above. Accordingly, the current price cap on DCCs will expire on 31 March 2021.
- 11.20 Our decision brings our approach to DCC in line with the approach which exists for porting conveyance charges charged by fixed providers⁵⁸⁶, who are also subject to the same general requirement but not to a charge control under the number portability rules.

⁵⁸⁶ Fixed providers also recover onward routing costs through porting conveyance charges known as average porting conveyance charges or APCCs. See for instance Ofcom, 2014. [Porting charges under General Condition 18. Statement on Guidance and Consultation](#). [Accessed 24 March 2021]