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Wholesale Voice Markets Review 2021–26

Main document

CONSULTATION:

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Contents

Section

1. Overview

This document explains how Ofcom proposes to regulate the wholesale markets that underpin landline and mobile telephone calls in the UK.

Telephone calls are an essential service for many people. Last year alone, 200 billion minutes of calls were made by customers using a landline or a mobile service. Competition in these markets can result 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 people's ability to call each other.

The way people speak to each other on the phone has been changing significantly over time. Mobile use is increasing and landline use is declining. The traditional landline telephone network in the UK, the public switched telephone network, 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 landlines services will increasingly be delivered over broadband connections.

We set out below our plans for regulation of the wholesale markets for call services from April 2021 to March 2026. Our proposals reflect the changes occurring in these markets.

What we are proposing

To deregulate the wholesale market for landline call origination, which enables people to make outbound calls over a landline. We propose to remove the current regulation on BT's Wholesale Call Origination (WCO) service because, as providers move to more modern methods of supplying calls, 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 during that transition.

To continue to set caps on the charges for terminating landline and mobile calls. Call termination is a wholesale service provided by a phone company to connect incoming calls to a customer on its network. If we did not set 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 would apply to landline and mobile calls that originate and terminate within the UK. Under our proposals, the mobile call termination price cap will be lower than the current rate, in line with the lower costs of providing call termination. In the first year of the market review period, 2021-22, we propose this cap to be set between 0.257 and 0.485 pence per minute. For landline call termination, our proposals are to maintain the current price cap at the same level in real terms, which currently stands at 0.0292 pence per minute.

For calls originated 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 would replace the current caps on termination rates for calls originated abroad. This proposal would only take effect for EEA countries if current EU rules relevant to our regulation of termination rates no longer apply after the transition period. We propose to allow UK communications providers to set termination charges for incoming calls from abroad that can be

higher than the caps we are proposing in this review for calls within the UK, but only in circumstances where the UK communications provider faces a high termination charge when its customers make calls to that international destination, and only up to the level of the termination charge set by its international counterparty. This is a change from the current situation, where the termination price caps apply to all calls regardless of their origin.

To gradually 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 telephony network. We propose to regulate IP interconnection so that BT has to interconnect on fair, reasonable and non-discriminatory terms, including on prices. We do not propose to set more specific charge controls on BT for IP interconnection. We also propose to require BT to publish a timetable for interconnection migration.

As part of the move to modern interconnection, to require BT to offer interconnection with its IP network for all landline calls at the regulated termination rate from April 2025 onwards. This is to provide certainty to telecoms providers that by April 2025, they will be able to access the regulated termination rate via IP interconnection for all calls to BT customers, 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 impose mobile termination rates on calls to 070 numbers. This is to avoid the harm caused by high termination rates, which used to lead to high prices, bill shock and scams.

To remove the charge control for conveyance of calls to ported mobile numbers (Donor Conveyance Charges (DCC)). However, we will retain the requirement that those charges are set at costs, and we expect that in future those charges would not exceed the current level.

To incentivise the use of common technical standards. We are not, however, proposing to require specific technical standards.

This review does not cover Wholesale Call Origination in the Hull Area, which is subject to a separate consultation.

Next steps

We invite responses to this consultation by 8 October 2020.

We will publish our statement setting out our decisions before the new regulation will take effect in April 2021.

2. Summary of our proposals

2.1 This section provides a summary of our proposals, which are set out in more detail in the sections which follow, in relation to market definition, Significant Market Power (SMP) determinations and remedies. We also describe the regulatory framework within which we have made our proposals.

2.2 We have reviewed the following markets:

- The Wholesale Call Origination (WCO) market in the UK (excluding the Hull Area).[1] This market was last reviewed in our Narrowband Market Review statement in November 2017 (2017 NMR Statement);[2]
- The Wholesale Call Termination (WCT) markets. These markets were last reviewed in the 2017 NMR Statement;[3]
- 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;[4]
- The 070 termination markets. These markets were last reviewed in a statement in October 2018.[5]

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).[6]

Legal and regulatory framework

Market review process

2.4 Annex 5 provides an overview of the market review process. As required by the regulatory framework, we have reviewed the markets listed in paragraph 2.2 in three analytical stages:

- we have provisionally identified and defined the relevant markets, taking into account national circumstances;
- we have assessed whether the markets are effectively competitive, which involves assessing whether any operator has SMP in any of the relevant markets; and

[1] The Wholesale Call Origination (WCO) market in the Hull Area is addressed the recent consultation on our review of fixed telecoms in Hull Area. Ofcom, 2020. *Hull Area Wholesale Fixed Telecoms Market Review 2021-26: Consultation* (the 2020 Hull Review Consultation), Volume 2, Section 5.
[2] Ofcom, 2017. *Narrowband Market Review: Statement* (2017 NMR Statement)
[3] Ofcom, 2017. 2017 NMR Statement
[4] Ofcom, 2018. *Mobile Call Termination Market Review 2018-2021: Final Statement* (2018 MCT Market Review Statement)
[5] Ofcom, 2018. *Personal numbering – Review of the 070 number range: Final Statement* (2018 070 Market Review Statement)
[6] Ofcom, 2018. *Review of mobile donor conveyance charges for the period 2018 to 2021: Statement* (2018 DCC Review)

- where we propose to find SMP, we are also proposing appropriate remedies, based on the nature of the competition problems identified in the relevant markets.

2.5 Consistent with our duties, we are taking due account of any applicable Recommendations or Guidelines issued by the European Commission. In particular, we are taking due account of the European Commission's (EC) Recommendation on relevant product and service markets (the 2014 EC Recommendation)[7] and SMP Guidelines.[8]

Forward look

2.6 Market reviews look ahead to how competitive conditions may change in the future. For the purposes of this review, we consider the period up to March 2026[9], reflecting the characteristics of the retail and wholesale markets and the factors likely to influence their competitive development.

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 proposals 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 5 also describes our statutory duties and the matters to which we should have regard in the performance of our functions.[10] Our Strategic Review of Digital Communications (DCR)[11] set out how we intended to approach the exercise of our functions to regulate communications markets in accordance with our duties. We consider that the proposals set out in this Consultation, which reflect the DCR strategy, meet our duties in section 3 of the Communications Act 2003 (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.

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[7] Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (2014/710/EU).

[8] Guidelines on market analysis and the assessment of significant market power under the EU regulatory framework for electronic communications networks and services (2018/C 159/01).

[9] Under Article 67 of Directive 2018/1972 establishing the European Electronic Communications Code (the EECC), the market review period is 5 years, which the UK Government has indicated it is minded to transpose into UK law by 21 December 2020. DCMS, 2020. *Government response to the public consultation on implementing the European Electronic Communications Code* (dated 23 July 2020)

[10] The UK left the European Union on 31 January 2020. A consequence of this is that some of our functions under the Act, including certain functions relevant to this review, will be amended. We consider that the proposals set out in this consultation would continue to fall within the scope of our powers and meet our duties.

[11] Ofcom, 2016. *Strategic Review of Digital Communications*.

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 action is needed.

2.11 We consider that our proposals are also consistent with our duty to act in accordance with the five requirements in section 4 of the Act, as it will apply when the amendments in Part 1 of Schedule 1 to the Electronic Communications and Wireless Telegraphy (Amendment etc) (EU Exit) Regulations 2019 come into force.

2.12 In identifying and analysing the markets in this consultation, we have taken due account of all applicable guidelines and recommendations which have been issued or made by the European Commission in pursuance of the provisions of an EU instrument and which relate to market identification and analysis or the determination of what constitutes significant market power in accordance with section 79 of the Act.

2.13 In developing our remedies in this consultation, we have taken due account of all applicable recommendations issued by the European Commission under Article 19(1) of the Framework Directive in accordance with our duties under section 4A of the Act.[12]

2.14 Where relevant, we explain how we have taken account of these instruments.

European Electronic Communications Code (EECC)

2.15 Directive EU 2018/1972 entered into force on 20 December 2018. It established the European Electronic Communications Code (the EECC), which amends and replaces the current EU regulatory framework for electronic communications.[13] The relevant provisions of the EECC are set out in Annex 5 of this document.

2.16 The UK Government consulted in July 2019 on its proposed approach to implementing the EECC into national law.[14] Its consultation included proposals on the key legislative changes that will be required to implement the EECC in the UK. The UK Government published its

[12] Under Article 3(3) of the Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators of Electronic Communications (BEREC) and the Office (the BEREC Regulation) BEREC Regulation, we are required to take the utmost account of any relevant opinion, recommendation, guidelines, advice or regulatory practices adopted by BEREC relevant to the matters under consideration in this review.
[13] Directive 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, 7 March 2002 (as amended) (Access Directive); Directive 2002/20/EC on the authorisation of electronic communications networks and services, 7 March 2002 (as amended) (Authorisation Directive); Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services, 7 March 2002 (as amended) (Framework Directive); Directive 2002/22/EC on universal service and users' rights relating to electronic communications networks and services, 7 March 2002 (as amended) (Universal Service Directive).
[14] Department for Digital, Culture, Media and Sport, 2019. *Implementing the European Electronic Communications Code* (dated 16 July 2019).

response to the public consultation and its approach to the implementation of the EECC in July 2020.[15]

2.17 In light of that response, we anticipate that the Act will be amended to reflect provisions of the EECC before we reach our final decisions on the matters set out in this consultation (our final statement is currently planned for early 2021).

2.18 We consider our proposals are consistent with the Government's approach to the implementation of the EECC. In particular, we note that the Government considers that it is appropriate not to transpose Article 75, which relates to the European Commission's planned approach to setting a single, Union-wide mobile call termination rate and wholesale call termination rate.

2.19 Article 3 of the EECC sets out the general objectives that national regulatory authorities should pursue. These mirror to a large extent the objectives currently set out in Article 8 of the Framework Directive, which are reflected in our existing duties under section 4 of the Act (such as the promotion of competition and citizens' interests). However, Article 3 of the EECC introduces a new objective to promote connectivity and access to, and take-up of, very high capacity networks, including fixed, mobile and wireless networks, by all citizens and businesses of the Union (we refer to this below as the 'connectivity objective'), and related amendments to the other objectives. We consider that our proposals are also consistent with Article 3 of the EECC.

Strategic Statement position

2.20 As required by section 2B(2) of the Communications Act 2003, we have had regard to the UK Government's Statement of Strategic Priorities (SSP)[16] 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.

Market definition, SMP findings and remedies

Proposed market definition, SMP findings and remedies for WCT markets

2.21 We propose to define the WCT markets as product markets for wholesale call termination services that are provided by each named fixed telecoms provider to another communications provider, for the termination of voice calls to United Kingdom geographic numbers in the area served by that named fixed communications provider.

[15] Department for Digital, Culture, Media and Sport, 2020. *Government response to the public consultation on implementing the European Electronic Communications Code* (dated 22 July 2020).
[16] 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).

2.22 We provisionally found that there is a separate fixed call termination market for each named fixed communications provider, in which we propose that the named fixed communications provider has SMP.

2.23 Our proposed remedies to address the SMP in all WCT markets are:

a) A network access obligation on all WCT providers;

b) A charge control (without a price notification obligation) on calls originated in the UK on all WCT providers; and

c) 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.

2.24 Furthermore, we propose additional remedies that are specifically for BT and its provision of WCT. These are:

a) a requirement not to unduly discriminate;

b) a requirement to publish a Reference Offer; and

c) accounting separation and cost accounting obligations.

2.25 In addition, we propose to regulate BT's IP interconnection services and maintain current regulation until 1 April 2025 on its TDM interconnection circuits. In relation to IP interconnection services, among other things, our proposals include a fair and reasonable charges obligation supplemented by guidance, but no charge control. We also propose to require BT to offer interconnection with its IP network for all landline calls at the regulated termination rate from 1 April 2025 onwards, and to impose a transparency obligation concerning BT's timetable for migration of its points of connection for WCT to its IP network.

Proposed market definition, SMP findings and remedies for MCT markets

2.26 We propose to define the MCT markets as product markets for mobile call termination services that are provided by a named mobile communications provider to another communications provider, for the termination of voice calls to UK mobile numbers in the area served by that named mobile communications provider.

2.27 We provisionally found that there is a separate mobile call termination market for each named mobile communications provider, in which we propose that the named mobile communications provider as SMP.

2.28 Our proposed remedies to address the SMP in all MCT markets are:

a) A network access obligation on all MCT providers;

b) A charge control (without a price notification obligation) on calls originated in the UK on all MCT providers; and

c) 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.

Proposed market definition, SMP findings and remedies for 070 termination markets

2.29 We propose to define the 070 termination markets as the wholesale termination services that are provided by a named 070 number range holder to another communications provider for terminating calls to the 070 numbers within the range it holds.

2.30 We provisionally found that there is a separate 070 call termination market for each named 070 number range holder, in which we propose that the named 070 number range holder has SMP.

2.31 We propose to continue to impose a charge control on 070 termination rates, set at the same rate as the charge control for mobile call termination.

Other markets and regulations within this Review

2.32 We have also reviewed the WCO market and propose to deregulate this market. BT has announced that it will switch off its traditional telephony network (which uses time division multiplexing (TDM) technology) 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.[17]

2.33 As a result of these developments, we expect providers to switch to using broadband access and IP-based voice services over this market review period (2021-2026), and no longer needing to buy WCO from BT. Accordingly, we consider that there will no longer be high and non-transitory barriers to entry in the WCO market, and that the WCO market structure will tend towards competition over the review period (see Section 4 for more information). We are therefore proposing that there is no basis to maintain SMP regulation on BT in respect of WCO.

2.34 We have also reviewed the direction we made in 2018 under GC18, setting a cap on DCCs. We are proposing to no longer set a price cap on the DCC.

Impact of the Covid-19 pandemic on information gathering

2.35 On 24 March 2020, Ofcom decided to suspend all existing consultation deadlines and information requests, as well as put all new consultations, decisions and information

[17] 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*

requests on hold.[18] This suspension on information gathering lasted until the beginning of June 2020.[19]

2.36 This decision was taken in recognition of the reprioritisation of work by the companies that we regulate in order to ensure the continued resilience of vital networks during the early days of the Covid-19 pandemic, as well as maintain support for consumers and businesses. We considered that it was appropriate to take a pragmatic approach to information gathering, in order that stakeholders could focus their time and effort on business-critical matters.

2.37 Given the suspension on information gathering during the development of our consultation, we have made less use of our information-gathering powers to obtain relevant information for the purposes of this review and preparation of our consultation proposals than would normally be the case. In the interests of pragmatism, where appropriate, we have drawn on previous analysis and made greater use of information that has been gathered as part of our routine monitoring of telecoms markets, such as the telecoms data updates[20], and on information provided by stakeholders in meetings and calls with Ofcom for the purposes of our review.

Impact assessment and equality impact assessment

Impact Assessment

2.38 This consultation document constitutes our impact assessment for the purposes of section 7 of the Act.

2.39 Impact assessments provide a valuable way of assessing the options for regulation and showing why the chosen option was preferred. They form part of best practice policymaking. This is reflected in section 7 of the Act, which means that, generally, we have to carry out impact assessments in cases where our conclusions would be likely to have a significant effect on businesses or the general public, or where there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out impact assessments in relation to the great majority of our policy decisions

Equality Impact Assessment

2.40 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

[18] 'Ofcom information on the coronavirus (Covid-19)' published on the 24 March 2020 [Accessed 21 July 2020]
[19] Ofcom, 2020. *Ofcom's Plan of Work 2020/21: Making communications work for everyone*, paragraph 2.20.
[20] Ofcom's telecoms data updates website [Accessed 21 July 2020]

and foster good relations between persons who share specified protected characteristics and persons who do not.

2.41 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.

2.42 To help us comply with our duties under the 2010 Act and the 1998 Act, we assess the impact of our proposals on persons sharing protected characteristics and in particular whether they may discriminate against such persons or impact on equality of opportunity or good relations.

2.43 While our on-going research does show evidence of variation in consumption of fixed voice services, we do not consider that the wholesale regulation proposed in this review is likely to have a disproportionate impact on any of the groups. 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.

2.44 Accordingly, we do not consider that our proposals have equality implications under the 2010 Act or the 1998 Act.

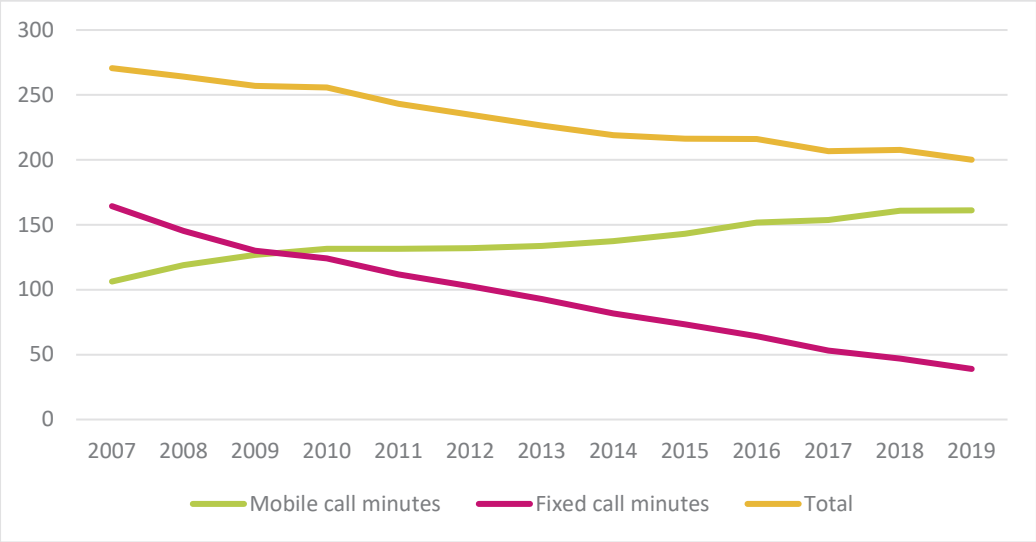
3. Background

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. There are continued declines in the use of fixed line telephone services (landlines), while there are substantial increases in the use of mobile services, over-the-top (OTT) voice services and messaging services.[21] Fixed call volumes have declined by 76% from 164bn minutes in 2007 to 39bn minutes in 2019,[22] while mobile call volumes have increased 52% from 106bn minutes in 2007 to 161bn minutes in 2019.[23]

Figure 3.1: Mobile and Fixed call volumes (bn of minutes)[24]



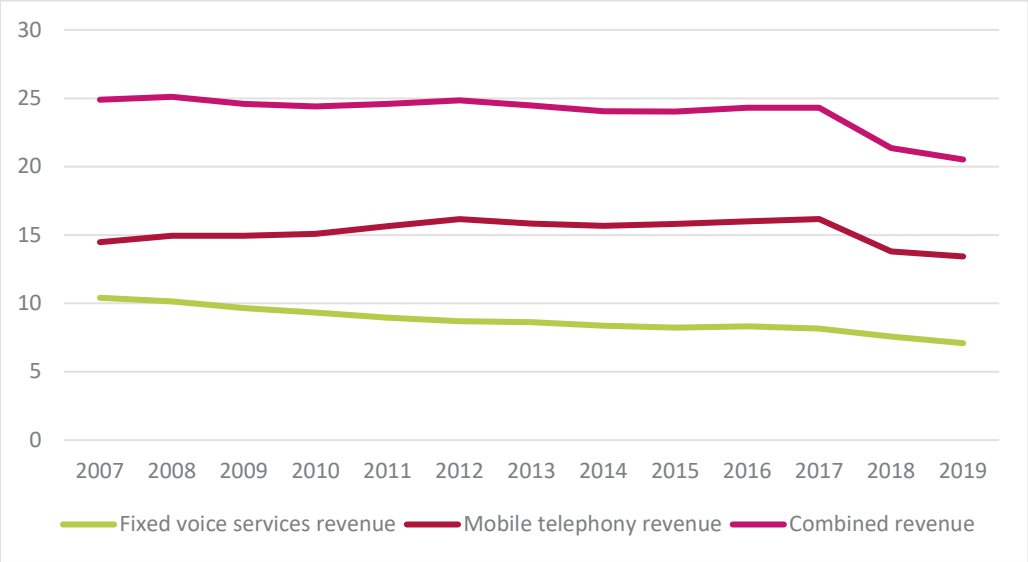
Source: Ofcom Telecommunications Market Data Update Q4 2019

[21] For instance, 69% of UK adults have ever used their mobile for voice or video calls, instant messaging or any other OTT use. Ofcom, 2020. *Technology Tracker 2020*.
[22] Fixed Table 3 - 'Summary of call volumes (millions of minutes)'. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[23] Mobile Table 2 - 'Call and message volumes by call type (billions of minutes/messages/PB)'. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[24] 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, 2020. *Telecommunications Market Data Update Q4 2019*.

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

3.3 The past two decades have seen a decline in the usage of landlines, and in fixed call revenues. While the total number of UK landlines has remained relatively stable, at 32 million[25], and the majority (78%) of households still have a landline, only 54% of people actually use their landline to make calls.[26] Revenues of landline services fell by 32% from £10.4bn in 2007 to £7.1bn in 2019, a decline of £3.3bn.[27]

Figure 3.2: Mobile and landline service revenues (£bn)[28]



Source: Ofcom Telecommunications Market Data Update Q4 2019

3.4 Qualitative research carried out in 2019 by Ofcom on declining calls and changing behaviours suggest customers are making fewer fixed calls for a number of reasons[29], including increased mobile phone ownership, which now stands at 96% of all UK households[30], and the perceived convenience and low cost of using a mobile handset to communicate.[31]

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[25] Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[26] Ofcom, 2020. *Technology Tracker 2020*.
[27] Revenues of access and calls for fixed voice services was £10.4bn in 2007. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[28] Fixed voice revenue figures are based on Fixed Table 1 - 'Summary of network access & call revenues (£millions)' (these revenue figures are not intended to include subscription revenues for internet access although some element may remain). Mobile calls revenues are based on Mobile Table 1 - 'Estimated retail revenues generated by mobile telephony (£millions)'. From 2018, bundled revenues are reported according to the new IFRS15 accounting standard, and they do not include any device revenues. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[29] 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*.
[30] Ofcom, 2020. *Technology Tracker 2020*.
[31] 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,

3.5 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.[32] 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.[33]

3.6 There has also been a significant decline in the use of landlines by businesses. The number of business landlines has declining 54%, from 10.8 million in 2007 to 5 million in 2019.[34] Businesses are also making fewer calls, with call volumes falling 76% from 54bn minutes in 2007 to 13bn minutes in 2019.[35] Landline service revenues from business customers have also declined significantly, falling 77% from £2.1bn in 2007 to £471m in 2019.[36]

3.7 For micro-businesses, our qualitative research suggests that, of those seeking to change from landlines, many gave the reasons that they wanted to increase their reach to new and existing customers and clients; to increase speed, efficiency and productivity; and, for some, to engage more deeply and less obtrusively with their customers or clients.[37]

3.8 However, landlines remain valued by many. 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.[38] 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 moving to use of a mobile number would make customers think their business less trustworthy and reputable.[39]

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%) only have a landline, with no access to mobile services.[40]

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*.

[32] Ofcom, 2020. *Declining call and changing behaviour research 2020,* Section 4.2, p.15.

[33] 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.

[34] Summary of business exchange line numbers. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.

[35] Summary of business call volumes by operator – All Operators. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*

[36] Summary of business network access & call revenues. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.

[37] Ofcom, 2020. *Declining call and changing behaviour research 2020,* Section 1.2.3, page 7.

[38] Ofcom, 2020. *Declining call and changing behaviour research 2020,* Section 1.2.1, page 6

[39] Ofcom, 2020. *Declining call and changing behaviour research 2020.* Section 1.2.3, page 7

[40] 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*.

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). Mobile call volumes continue to increase year-on-year, although that increase slowed down between 2018 and 2019, increasing by only 0.2%.[41] As a reflection of this general trend, mobile voice traffic has increased 30% during the coronavirus lockdown.[42]

3.11 The number of mobile subscriptions also continues to increase, with active subscriptions reaching 85.5 million at the end of Q4 2019, up 1.5 million from Q4 2018.[43] However, mobile call revenues decreased between 2018 and 2019, falling by 3% from £13.8bn in 2018 to £13.4bn in 2019.[44]

3.12 Our qualitative research suggests that customers perceive mobile minutes (which form an integral part of the offer for pay-monthly mobile phone contracts) as 'free' compared to expensive landline calls, with respondents noting a trend towards contracts with very high or unlimited minutes and texts.[45]

3.13 For micro-businesses, our qualitative research suggests that email, text, and, for some, OTT allowed them to communicate more easily and quickly. Our research also suggested some businesses attached less importance to the need for a landline to provide reassurance or knowledge of where the company is based for their clients or customers.[46]

Increasing use of OTT voice services and OTT messaging services

3.14 Our recent research found that OTT services are now widely used. For instance, 58% of UK adults used their mobile for instant messaging (using services such as Facebook Messenger, Snapchat, WhatsApp), and 43% of UK households have used their mobile for OTT voice or OTT video call services.[47] WhatsApp is the most frequently used OTT service for voice calls on a daily basis, followed by Facebook Messenger.[48] Our qualitative research

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[41] In Q4 2019 the number of outgoing mobile voice call minutes was 41.5bn, while in Q4 2018 it was 40bn minutes. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[42] Ofcom analysis of public information from network providers, March, April, May 2020. Ofcom, 2020. *Online Nation 2020*, pages 38 to 39.
[43] Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[44] Mobile calls revenues are based on Mobile Table 1 - 'Estimated retail revenues generated by mobile telephony (£millions)'. From 2018, bundled revenues are reported according to the new IFRS15 accounting standard, and they do not include any device revenues. Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*.
[45] Ofcom, 2020. *Declining call and changing behaviour research 2020.*
[46] The main reasons for decline among non-landline users and non-promoters in our research were: Email, text and, in some cases OTT communication, were variously easier, quicker, more efficient, engaging, less intrusive; Less importance to clients or customers, in terms of reassurance (that the company is well-established) or knowledge of where the company is based (via the location identity of the area code); and Some businesses preferred using mobile phones because they wanted to be able to change business premises easily, without having to change their phone number. Ofcom, 2020. *Declining call and changing behaviour research 2020,* Section 4.3, page 16
[47] Ofcom, 2020. *Technology Tracker 2020*.
[48] 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)*. Base: All respondents who have used online communication services or apps in the past 12 months (1692)

suggests that customers choose the service which most suits their needs for each type of communication, and/or those of the person they are contacting, and may use multiple services for the same purpose.[49] 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 or offering it as an integral parts of their offer to customers, such as with Virgin Mobile[50] or Voxi.[51]

3.15 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.[52] Online communication services are also being used for regular text messaging with 73% of UK adult internet users using these services to send messages at least weekly, and the level of daily WhatsApp usage for text messaging was similar to the daily use of SMS.[53]

3.16 For those customers with a disability, our research suggests that smart phones 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.[54]

Approach to the review of wholesale voice services

3.17 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.

[49] Ofcom, 2020. *Declining call and changing behaviour research 2020.*
[50] Virgin Mobile offers 'Data-free messaging' 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 15 June 2020].
[51] 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 15 June 2020].
[52] Ofcom, 2020. *Declining call and changing behaviour research 2020.*
[53] Ofcom, 2020. *Online Nation 2020.*
[54] 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).*

Approach to the review of wholesale voice markets

2017 Narrowband Market Review

3.18 In 2017 we published the Narrowband Market Review (NMR) Statement[55] which covered the following five markets: wholesale fixed analogue exchange lines; wholesale ISDN30; wholesale ISDN2; wholesale call origination; and wholesale call termination.[56] These markets relate to the wholesale inputs which underpin the delivery of fixed voice telephone services.

3.19 Wholesale fixed analogue exchange lines (WFAEL) are standard fixed lines (with analogue service presentation) 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 who 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 complementary wholesale service which facilitates the provision of outbound telephone calls from these narrowband access services.

3.20 Wholesale call termination (WCT) 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.

3.21 In the 2017 NMR, we found that BT continued to have significant market power (SMP) in the WFAEL, ISDN2, ISDN30 and WCO markets. We also found that all holders of UK geographic numbers had SMP in WCT.

2018 Review of Donor Conveyance Charges

3.22 Number portability allows customers to keep their telephone numbers when switching communications providers.

3.23 When a mobile subscriber has 'ported' their number to another provider, calls to that number are first routed to the network that originally held the number. 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.

3.24 The 2018 Review of Donor Conveyance Charges (2018 DCC Review) looked at the wholesale porting charges (known as the donor conveyance charge (DCC)) that mobile operators charge each other in order to recover certain costs associated with the provision

[55] Ofcom, 2017. *Narrowband Market Review: Statement.*

[56] 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.

of mobile number portability.[57] The 2018 DCC Review set the maximum DCC for 2018 – 2021.[58]

2018 Mobile Call Termination Market Review

3.25 Mobile Call Termination (MCT) 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.[59]

3.26 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.

3.27 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 the mobile termination rate.

2018 Personal numbering – Review of 070 Number Range

3.28 070 numbers were designed to be used for personal or 'follow-me' services. When someone calls a 070 number, their communications 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 communications provider for making that call.[60]

3.29 We found that communications providers who held 070 numbers 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 MTR, which was set in the 2018 MCT Market Review.

2019 Future of interconnection and call termination – First consultation

3.30 In 2019 we published an initial consultation outlining several suggested approaches to the regulation of interconnection and call termination in the forthcoming review period.

3.31 We noted that the migration of landlines to newer 'internet protocol' (IP) technology has implications for how we regulate telephone services.[61] In particular, we explained how the

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[57] Ofcom, 2018. *Review of mobile donor conveyance charges for the period 2018 to 2021*.
[58] BT levies Average Porting Conveyance Charges (APPCs) 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 APPCs 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.
[59] Ofcom, 2018. *Mobile Call Termination Market Review 2018-2021*.
[60] Ofcom, 2018. *Personal numbering – Review of the 070 number range*.
[61] Ofcom, 2019. *Future of interconnection and call termination* (2019 First Consultation)

migration to IP might impact regulation of interconnection between other networks and BT's local exchanges.

Related market reviews of wholesale narrowband markets

Wholesale Fixed Telecoms Market Review 2021-26

3.32 We are reviewing the WFAEL, ISDN2 and ISDN30 markets for the forthcoming market review period as part of the Wholesale Fixed Telecoms Market Review 2021-26 (the 2021 WFTMR).[62] We provisionally concluded that the three criteria test is not met for any of these markets and we have proposed the removal of existing regulation from the WFAEL market. Separately, Openreach has voluntarily committed to a number of measures to support transition for WLR, wholesale ISDN2 and wholesale ISDN30 product users.[63]

Hull Area Wholesale Fixed Telecoms Market Review 2021-26

3.33 The Hull Area Wholesale Fixed Telecoms Market Review 2021-26 (the Hull Review) looks at the markets for WFAEL, ISDN2/30 and WCO in Hull. It also considers interconnection regulation in the Hull Area. We propose to deregulate the WFAEL, ISDN and WCO markets in the Hull Area. As the Hull Review considers the regulation of WCO and interconnection in the Hull Area, these are not covered by the Voice Markets Review.

Other related developments

Migration to IP networks

3.34 Telecoms providers with fixed voice networks in the UK are transitioning from providing telephone services using time division multiplexing (TDM) networks to modern internet protocol (IP) networks and are increasingly delivering telephone services over broadband connections, rather than traditional analogue service presentation over copper access networks. This change is driven by the obsolescence of TDM networks and the new focus on building fibre networks.

3.35 The migration will be a significant challenge for the industry. BT has already announced its intention to retire its TDM network and move all its allocated geographic phone number blocks to its IP network.[64] Other providers are also embarking on the migration of their customers to IP-based voice services over broadband, for instance Virgin Media intends to retire its TDM network over the next few years and currently anticipates completing its switch to IP in line with Openreach's timescales.[65]

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[62] Ofcom, January 2020. *Consultation: Promoting investment and competition in fibre networks – Wholesale Fixed Telecoms Market Review 2021-26* (the 2020 WFTMR Consultation)
[63] Ofcom, 2019. *Letter from Openreach to Ofcom on 'WLR and ISDN2/30 voluntary commitments'*.
[64] 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.
[65] Ofcom, 2019, *The future of fixed telephone services*.

3.36 Openreach aims to test its migration to fibre and to IP-based voice services through two trials. The first, in Mildenhall, is 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. The second, in Salisbury, will test the processes for migrating customers to fibre services and, ultimately, withdrawing copper services. We issued a statement on the regulatory changes we put in place to enable Openreach's trials.[66]

3.37 There are also wider commitments to fibre build by Openreach and alternative networks (altnets). Openreach has committed to a target of 4.5 million homes and business with FTTP by March 2021, and an aim of 20 million by 2025.[67, 68] Virgin Media will continue with its Project Lightning build[69] and other providers such as CityFibre and Hyperoptic, are forecasting coverage of 16 million UK premises by 2025 (according to Independent Networks Co-operative Association (INCA)).[70]

3.38 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.

3.39 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.[71] Broadly, the same expectations apply to migration to fibre connections.[72] Industry is currently developing a good practice guide through working groups run by the Office of the Telecommunications Adjudicator (OTA) and Openreach. This work includes the definition and identification of vulnerable consumers, issues around critical national infrastructure and communications. Ofcom is supportive of the development of such a good practice guide and we have written to the OTA2 setting out our expectations for this work in terms of scope, engagement with providers and the timing of outputs.

Retail Voice Only Commitments

3.40 In 2018 BT committed to implementing price reductions for voice only customers buying standalone landline services. Its commitment expires in Q4 2020/21 and we will consider

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[66] Ofcom, 2019. *Statement: Measures to support Openreach's trials in Salisbury and Mildenhall*.
[67] ISP review article entitled 'Openreach Quietly Hits 3 Million UK FTTP Broadband Premises' [Accessed 15 June 2020].
[68] In June 2020, Openreach committed to build fibre commercially (i.e. without public subsidy) to at least 3.2 million premises in Area 3 cumulatively by the end of 2025/26. Ofcom, 2020. *Consultation: Promoting competition and investment in fibre networks – Pricing wholesale local access services in Geographic Area 3 with a BT Commitment to deploy a fibre network*.
[69] ISP review article entitled 'Virgin Media Grow UK Fibre Network – Hints of Big Wholesale Shift UPDATE' [Accessed 15 June 2020].
[70] ISP review article entitled 'Alternative Full Fibre ISPs Aim to Cover 3.38 Million UK Premises by 2020' [Accessed 15 June 2020].
[71] Ofcom, 2019. *The future of fixed telephone services*.
[72] 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.*

what appropriate protections are necessary to ensure these customers receive value-for-money for the landline-only services they buy.[73]

[73] Ofcom, 2020. *Statement: Ofcom's Plan of Work 2020/21*.

4. Wholesale Call Origination

4.1 This section explains the product and geographic market definition in relation to Wholesale Call Origination (WCO). Because WCO is not on the list of markets that the EC has recommended for *ex ante* regulation, we consider whether the WCO market passes the 'three criteria test' and is therefore suitable for *ex ante* regulation.[74]

4.2 Given the technological changes that are taking place in the industry, our approach to the assessment of WCO is to first review market developments that are likely to occur over the forthcoming review period and, secondly, to consider whether the market definition used in our 2017 NMR review remains an appropriate frame of reference.

4.3 We provisionally conclude that the three criteria test is not met and accordingly that this market is not suitable for *ex ante* regulation. Consequently, we propose to remove existing regulation from the WCO market.

Background

4.4 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.

4.5 There are several providers of WCO in the UK. BT supplies WCO services over its TDM network to providers that use Openreach's Wholesale Line Rental (WLR) and ISDN products (which provide access to the line over which the calls are provided).[75] 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. They therefore generally provide their own call origination services.

4.6 In the 2017 NMR 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).[76] 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

[74] The market for WCO was removed from the EC's list of product and services markets identified as being susceptible to *ex ante* regulation in the 2014 EC Recommendation. To assess whether it is appropriate to impose *ex ante* obligations in a market which is not listed, the 2014 EC Recommendation sets out the following three criteria which must all be met: (i) the presence of high and non-transitory barriers to entry; (ii) a market structure which does not tend towards effective competition within the relevant time horizon; and (iii) the application of competition law alone is insufficient to adequately address the identified market failure(s).

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

[76] 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.

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.

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

Market developments in the forthcoming period

4.8 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.[77]

4.9 With BT's TDM switch-off, 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. However, providers using their LLU networks to provide voice services will continue to be able to originate their own calls and use their current separate access service (Metallic Path Facility (MPF)). Similarly, Virgin Media, which uses its cable network to supply voice services, will continue to be able to provide its own access and originate its own calls over that network.

4.10 Following BT's TDM switch-off, voice services over the Openreach network will be carried over a broadband connection rather than a dedicated analogue telephone network. To supply voice services to customers, providers will, therefore, need a suitable IP-based voice service and a suitable broadband access line to provide a connection to the internet. Broadband access lines are currently regulated as part of the Wholesale Local Access market and broadband access is being considered as part of the WFTMR.[78]

4.11 Openreach has stated that it does not intend to provide an IP-based voice service following its TDM switch-off. Providers will need to develop their own IP-based voice service or purchase a service from an existing supplier. We expect the widespread launch of managed IP-based voice services by a range of telecoms providers and third-party providers over the course of this review period.

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[77] 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.*

[78] Ofcom, January 2020. *Consultation: Promoting investment and competition in fibre networks – Wholesale Fixed Telecoms Market Review 2021-26* (the 2020 WFTMR Consultation)

4.12 As a result of these changes, over the period of the review we will see the steady migration of existing WLR lines to single order or fibre products, as well as the termination of new supply of WLR services.[79] As mentioned above, Openreach plans to have stopped providing WLR and ISDN services by the end of the review period.

4.13 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 no longer need to buy WCO from BT.

Market Definition

Product market

4.14 In previous reviews we have defined the product market for WCO as the wholesale service that enables voice calls over a fixed narrowband network (i.e. WFAEL, ISDN2 or ISDN30). This involves the conveyance of all signals (including relevant control signals) originating from the point in the network closest to the end customer's point of connection to the network where those signals can be accessed by another telecoms provider.

4.15 In previous reviews we have found that customers are not willing to substitute in sufficient numbers to alternatives such as mobile or OTT services 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.

4.16 As noted in section 3, fixed call volumes have continued to decline since 2017. There were 39bn minutes of fixed calls in 2019, a reduction of 26% from 2017.[80] 78% of households had a landline in 2020, down from 82% in 2017.[81]

4.17 There are signs that use of alternative methods of communication has continued to grow throughout the UK. There were 161bn minutes of mobile calls in 2019, an increase of 5% from 2017.[82] The proportion of households that have a mobile, but no landline, increased from 18% in 2017 to 22% in 2020.[83] The use of OTT voice services has also been increasing over the last few years, with the percentage of people that use OTT voice services growing from 55% in 2017 to 66% in 2020.[84]

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[79] Single Order GEA (SOGEA) enables the provision of wholesale superfast broadband without the need for WLR or MPF (or another copper voice service) to support it. Similarly, Single Order G.Fast (SOGFAST) enables the provision of wholesale G.Fast services without the need for a copper voice service to support it. G.Fast: higher bandwidth (over 100Mbps) technology provided using a combination of fibre and then copper connections.
[80] Ofcom, 2019. *Telecommunications Market Data Update 2019 Q4*, page 4 Table 3: Summary of call volumes.
[81] Ofcom, 2019. *Ofcom Technology Tracker 2020*, Table 27 QC1: Is there a landline phone in your home that can be used to make and receive calls?
[82] Ofcom, 2019. *Telecommunications Market Data Update 2019 Q4*, page 14 Table 2: Call and message volumes by call type.
[83] '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, 2019. *Ofcom Technology Tracker 2020*, Table 27.
[84] "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

4.18 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.[85] The price of mobile calls made outside of call bundles remains high, 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. OTT services such as WhatsApp remain available without users needing to incur charges.

4.19 Despite the falling price of potential substitutes, 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.[86] The price of fixed call bundles and out of bundle calls has increased in recent years.[87]

4.20 This indicates that mobile, OTT and other alternatives to making calls over a landline remain a relatively weak constraint on the price of making fixed calls at the retail level. 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. We therefore propose that the market definition in the 2017 NMR Statement will remain an appropriate frame of reference.

4.21 In the longer term, it remains possible that substitution between fixed and mobile calls or between fixed calls and OTT calls will increase. The move to IP-based voice services may lead to more suppliers offering attractive 'broadband only' services. This may lead to a greater propensity for customers to stop using their fixed connection for voice services, and for more of them to view mobile or OTT voice services as an alternative to fixed lines for voice calls.[88] However, it is difficult to predict in advance precisely how substitution patterns will be affected.

4.22 Given this, we are proposing to use the product market defined in the 2017 NMR Statement as a frame of reference to consider whether WCO still meets the three criteria test and, if that is the case, that the market remains susceptible to *ex ante* regulation.[89]

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.

[85] Ofcom, 2019. *Pricing Trends for Communications Services in the UK*, figure 20

[86] Ofcom, 2019. *Pricing Trends for Communications Services in the UK*, figure 31.

[87] Ofcom, 2019. *Pricing Trends for Communications Services in the UK*, figure 32

[88] Some landline customers may have had cause to use OTT services for the first time, or more frequently, as a result of Covid-19. This may have increased their propensity to view OTT services as a substitute for fixed voice calls.

[89] 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.

4.23 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 consultation we expect that IP-based voice services will form part of the WFAEL market as the major providers migrate to IP-based voice as their main technology for supplying voice services to customers.[90]

Geographic market

4.24 In the 2017 NMR Statement, we defined geographic markets for the UK excluding the Hull Area and, separately, the Hull Area.[91] We said that our assessment of geographic market definition for WFAEL was also relevant for WCO. Regarding the UK excluding the Hull Area, we said that uniform pricing at the retail level, as a result of the universal service condition (USC), is likely to extend to pricing at the wholesale level and supports a single market.

4.25 In our recent Wholesale Fixed Telecoms Market Review Consultation, we proposed a WFAEL market comprising the UK excluding the Hull Area and the USC for voice services at the retail level remains in place. On this basis, we consider that a single market for WCO in the UK excluding the Hull Area remains an appropriate frame of reference to consider the three criteria test.

Three criteria test for WCO

4.26 The WCO market is not listed in the 2014 EC Recommendation as a market in which *ex ante* regulation may be warranted.[92] Where a market is not on the list of markets in the 2014 EC Recommendation, National Regulatory Authorities (NRAs) in EU Member States must apply the three criteria test to identify whether those markets are susceptible to *ex ante* regulation. In the 2017 NMR Statement, we applied the three criteria test for WCO and found that these three criteria were satisfied. As part of this review, we have assessed whether this continues to be the case.

4.27 In undertaking this assessment, 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.[93]

[90] The 2020 WFTMR Consultation, Volume 2 Paragraph 9.20.
[91] The supply of WCO in the Hull Area was considered as part of our consultation for the Hull Area Wholesale Fixed Telecoms Market Review 2021-26.
[92] 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.
[93] Section 6 of the Act.

High and non-transitory barriers to entry

4.28 In the NMR 2017 we considered the following factors were relevant to our assessment of this criterion:

a) the high costs of building a sufficiently large direct access network;

b) 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

c) 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.

4.29 We do not expect these factors to hold true for the duration of the forthcoming 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) over the course of the next review period.

4.30 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. Effective competition in the supply of broadband access will be an important enabler of this change and the broadband access lines will continue to be reviewed and *ex ante* regulation put in place as appropriate.[94]

4.31 We therefore expect reliance on WCO to diminish as the next review period progresses and a much greater scope for rivals to provide a competitive alternative. As a result of these developments, the basis for our finding that there are high and non-transitory barriers to entry in the supply of WCO in the UK excluding the Hull Area will fall away by the end of the period of this review.

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

4.32 Having found in the NMR 2017 that barriers to entry remain high and persistent 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 noting that mobile, VoIP and OTT services were likely to offer increasing competitive pressure, 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 high market share, although declining, was still high (48% in Q4 2016/17).

[94] We have set out our proposals for the regulation of the WLA market in the 2020 WFTMR Consultation.

4.33 As set out above, we expect to see material changes in the structure of competition in the next review period, with a decline in the number of WLR lines as BT's TDM network is switched off and WLR is discontinued. Openreach has announced that it will not be developing a managed IP-based product to replace WLR. The services that will replace those provided over WLR will be supplied by other providers and we expect significant growth in the use of managed IP-based voice services as customers who value voice services at a fixed location are migrated to all-IP services. On this basis the market for WCO will, therefore, tend towards effective competition over the review period.

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

4.34 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

4.35 Given that, in our view, the market for WCO in the UK excluding the Hull Area does not meet two of the three criteria in the three criteria test we are not proposing to impose *ex ante* regulation in the supply of WCO.

Transitional arrangements

4.36 We have also considered whether it might be necessary to impose some form of transitional regulation in the interim period pending the switch off of BT's TDM network. While the WCO market is no longer suitable for *ex ante* regulation there will remain a substantial number of customers, through the early years of the market review period, that will be supplied over BT WLR and ISDN lines and so will be reliant on WCO from BT for their outbound calls.

4.37 BT has decided to offer voluntary commitments in relation to WCO, corresponding to those offered by Openreach in regard to WLR and ISDN for the purposes of copper retirement.[95] 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

[95] Openreach, 2019. *Letter to Ofcom on WLR and ISDN2/30 voluntary commitment*.

- consider the interests of vulnerable end-users when setting WCO prices.

4.38 Having regard to BT's voluntary commitments, and our wider statutory duties to remove regulation where it is no longer required, we are not presently minded to impose such transitional provisions.

Consultation question

Question 4.1: Do you agree with our proposal not to regulate the WCO market on the basis that it no longer fulfils the three criteria test set out in the 2014 EC Recommendation? Please set out your reasons and supporting evidence for your response.

5. WCT and MCT market definition and SMP assessment

Summary

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 5.

5.2 The 2014 EU Recommendation identifies these wholesale markets as ones which may have the characteristics which justify *ex ante* regulation, on the grounds they meet the three criteria test.[96] We are of the view that the relevant conditions in these markets are largely unchanged since our decisions on these issues in the 2017 NMR Statement and 2018 MCT Market Review Statement and that these markets remain susceptible to *ex ante* regulation.

5.3 In relation to WCT, we provisionally 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."

5.4 In relation to MCT, we provisionally 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."

5.5 We have provisionally concluded that within those markets, 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.[97]

5.6 In light of our view that the relevant market conditions remain largely unchanged, the analysis in this Consultation is similar to the analysis undertaken in previous reviews.

5.7 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 and SMP 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 provisional conclusions in relation to WCT and MCT separately.

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[96] European Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services (2014/710/EU), 11 October 2014, OJEU L 295/79, (2014 EC Recommendation), see OJEU L 295/80-81, 84.

[97] As already outlined in Section 2, we have made less use of our information-gathering powers to obtain relevant information for the purposes of this review and preparation of our consultation proposals than would normally be the case. In particular, for the purposes of identifying providers with SMP in the WCT, MCT and 070 markets, we have referred to numbering information that we already hold. We will be verifying the proposed designations following the publication of our consultation.

Features of call termination relevant to market definition

Demand-side substitution at the retail level

5.8 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.

5.9 In terms of the demand response at the retail level, for alternative methods of contact to make a significant non-transitory increase in price (SSNIP) unprofitable would require:

a) the originating provider to respond to an increase in termination rates by increasing its retail prices;

b) callers to be aware of this price increase;

c) 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

d) this substitution to be of an extent that an increase in termination rates above competitive levels would be unprofitable.

5.10 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.

Substitution at the wholesale level

Demand-side substitution

5.11 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 response to a SSNIP.[98]

Supply-side substitution

5.12 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 their number range. A provider is unlikely to have an incentive to give up its monopoly on

[98] 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. We also consider that it would not become material in response to a SSNIP, which would be likely to be small as discussed below.

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

5.13 If the analysis of demand- and supply-side substitution 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 at least one of two conditions is satisfied:

a) the individual markets face homogeneous competitive conditions, meaning that providers' conduct would be the same in each; and/or

b) there is a common pricing constraint, which means that suppliers' pricing and behaviour is likely to be the same in each market being considered.

5.14 We consider that fixed termination markets and mobile termination markets, respectively, would satisfy the first condition. 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. There may also be a common pricing constraint at the wholesale level for holders of geographic numbers and holders of mobile numbers respectively, as it is likely to be costly and complex for telecoms providers to charge different termination rates for calls to individual numbers.

Geographic market definition

5.15 We consider that the geographic extent of each market would be defined as the area served by that provider. The competitive conditions a provider faces in providing termination services would not be 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.

WCT market definition

5.16 This section takes as our starting point voice calls to the recipient's fixed geographic number (that is, to numbers beginning 01 or 02).

5.17 We first consider whether a SSNIP in the termination rate would be unprofitable if passed through to retail prices. In Section 6 we explain that the cost of terminating a fixed call is approximately 0.03ppm. Therefore, a SSNIP would equate to a price increase of up to 0.003p ppm. If this were passed onto retail prices, it would make up a small fraction of the

cost of retail bundles that can include calls, lines and other products, such as broadband. It would also make up a fraction of the cost of retail calls where those are charged on a per minute basis rather than bundled, as retail prices are significantly higher than this.[99] As a result, we are of the view that a SSNIP in the wholesale price would have a negligible impact on consumer behaviour. We therefore provisionally conclude that there are no sufficiently close substitutes at the retail level to broaden the retail market beyond the focal product of calls to a fixed geographic number.

5.18 For the reasons discussed above, we are of the view that there are also no sufficiently close substitutes at the wholesale level to broaden the market at the wholesale level.

5.19 The analysis of demand- and supply-side substitution points to a separate product market for WCT being defined for each individual fixed geographic number. We aggregate WCT markets to encompass termination to all geographic numbers controlled by a particular terminating provider, for the reasons described above.

5.20 We also provisionally conclude that the relevant geographic market is determined by reference to the area in which the provider offers termination services, for the reasons described above.

Numbers falling within our market definition

Mobile and other non-geographic numbers

5.21 We do not propose to extend our market definition to include termination to mobile and other non-geographic numbers. In terms of mobile call termination, competitive conditions are different. For example, the cost of providing mobile call termination is materially higher than the cost of terminating a fixed call.[100] Competitive conditions are also different for termination of non-geographic fixed numbers. For example, these calls are made to a service provider, which purchases services such as call management, conditional call routing and recorded announcements in addition to WCT.[101]

Hosted and ported numbers

5.22 We propose to define the market 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 the call 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 number range.

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[99] For example, for its bundled package which includes a landline and 700 minutes per month, BT charges £7 more than its landline only package. This equates to a price of 1 ppm. A SSNIP of 0.003 ppm would have little impact in this context (a price increase of approximately 0.3%). It would have even less impact in comparison to BT's out of bundle charge of 20ppm. See BT's website on UK call charges [Accessed 22 July 2020].

[100] As we explain in Section 6, we estimate that the cost of terminating a mobile call is approximately 0.5ppm, whereas the cost of terminating a fixed call is approximately 0.03ppm.

[101] We remain of the view that the additional reasoning described in the 2017 NMR Statement in relation to non-geographic numbers also still applies. See the 2017 NMR Statement, paragraphs 12.34 to 12.38.

5.23 Where numbers have been ported, we propose 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.

Provisional conclusion on WCT market definition

5.24 We provisionally 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."

5.25 This is the same as the market we defined for WCT in the 2017 NMR Statement.

MCT market definition

5.26 The starting point for our analysis in this section is voice calls to a specific UK mobile number.

5.27 We first consider whether a SSNIP in the termination rate would be unprofitable if passed through to retail prices. In Section 6 we estimate that the cost of terminating a mobile call is less than 0.5ppm. Therefore, a SSNIP would equate to a price increase of up to 0.05ppm. For calls that are part of a call allowance within a bundle, this would make up a small fraction of the cost of bundles that can include calls, data and texts. This would also make up a fraction of the cost of retail calls where those are charged on a per minute basis rather than bundled, as retail prices are significantly higher than this.[102] We therefore provisionally conclude that there are no sufficiently close substitutes at the retail level to broaden the retail market beyond the focal product of calls to a specific UK mobile number.

5.28 It may be easier for callers to use an OTT service if they are calling a mobile number, rather than a fixed geographic number, as OTT services are often provided via an app on a smartphone. However, we do not think that OTT is a sufficient constraint to broaden the market given the small impact a SSNIP would be likely to have, as described above.

5.29 For the reasons discussed above, we are of the view that there are also no sufficiently close substitutes at the wholesale level to broaden the market at the wholesale level.

[102] For example, a SSNIP of 0.05ppm would have little impact in the context of the average retail price for out of bundle calls, which was 37ppm in 2019. See Ofcom's recent 'Pricing trends for communications services in the UK' document.

5.30 The analysis of demand- and supply-side substitution points to a separate product market for MCT being defined for each individual mobile number. We aggregate MCT markets to encompass termination to all mobile numbers controlled by a particular terminating provider, for the reasons described above.

5.31 We also provisionally conclude that the relevant geographic market is determined by reference to the area in which the provider offers termination services, for the reason described above.

Numbers and services falling within our proposed product market definition

5.32 Here we clarify that the termination services covered by our market definition includes not only conventional calls to UK mobile numbers, but also the services described below.

Services falling within our market definition

5.33 For similar reasons as those discussed above, and in more detail in the 2018 MCT Market Review Statement, our proposed market definition includes:

a) Calls to voicemail and national roaming;

b) Calls to call forwarding services; and

c) Other calls to UK mobile numbers (e.g. test calls, calls to customer services).[103]

International and roaming calls

5.34 Our proposed market definition includes calls to UK mobile numbers originated internationally.

5.35 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

5.36 Where numbers have been ported, we propose to include termination services provided by both donor providers and recipient providers. As described in Section 11, calls to ported numbers are usually 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 the donor provider as well as the recipient provider should be considered as providing a termination service. This is a change from the markets

[103] 2018 MCT Market Review Statement, paragraphs 3.77 to 3.80, 3.83 and 3.84.

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

5.37 Although UK numbers allocated to providers in the Channel Islands and the Isle of Man would fall within our proposed market definition if they provided MCT services to those numbers in the UK, in the 2018 MCT Market Review Statement we found that eight of the nine providers that are allocated UK mobile numbers but which operate in the Channel Islands or Isle of Man do not offer termination services in the UK. We therefore did not include these eight providers within our market definition and propose the same approach in this market review.[104] We propose to confirm which providers currently offer termination services in the UK through formal information requests, and include those that are being used for termination services in the UK within our market definition.

Provisional conclusion on MCT market definition

5.38 We provisionally conclude that the relevant markets are:

5.39 "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."

Market power assessment

Approach to the assessment of market power

5.40 In the sections above, we provisionally defined separate markets for WCT and MCT.

5.41 In this section we assess whether providers that operate in those markets have Significant Market Power (SMP) (as defined in section 78 of the Act and Article 14 of the Framework Directive). We assess this according to the following criteria:

a) high current and future market shares;

b) high barriers to entry;

c) an absence of effective countervailing buyer power (CBP); and

d) evidence of pricing above competitive levels.

5.42 As discussed at paragraph 5.7 above, there are shared features between WCT and MCT relevant to our assessment of SMP. We therefore assess of how both meet these criteria below, before setting out our provisional conclusions in relation to WCT and MCT separately.

[104] We included JT (Jersey) Ltd as evidence collected indicated that number ranges allocated to this company were being used for termination services in the UK. See footnote 94, 2018 MCT Market Review Statement.

Market shares

5.43 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

5.44 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.[105]

Countervailing buyer power

5.45 Subject to the regulatory obligations of telecoms providers, 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 raise their own rates in response to a price increase above the competitive level. However, the ability and incentive for telecoms providers to constrain prices using CBP is limited. In terms of threatening to stop purchasing termination in response to a price increase, this would be unlikely to be credible as telecoms providers have a commercial incentive to offer their customers the ability to call all numbers. In theory, a telecoms provider with a high share of WCT or MCT volumes could threaten to increase rates in response to a termination rate increase by the other party in order to keep rates low, although it is unclear that they would have the incentive to do so.

Pricing behaviour

5.46 The submissions we received from providers of both WCT and MCT as part of their obligation to notify Ofcom of their termination rates suggested they priced to the cap in the previous financial year, which is consistent with a finding of SMP.

Provisional conclusion on market power in WCT

5.47 Our assessment that each number range holder 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 provisionally conclude that each provider has SMP in the market for call termination to geographic numbers in the area served by that provider.

[105] We described our view that OTT VoIP bypass is unlikely to be a sufficient constraint in the market definition section above.

Provisional conclusion on market power in MCT

5.48 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 provisionally conclude that each MCT provider has SMP in the corresponding relevant market.

Consultation questions

Question 5.1: Do you agree with our proposed market definition in relation to WCT? Please set out your reasons and supporting evidence for your response.

Question 5.2: Do you agree with our proposed market definition in relation to MCT? Please set out your reasons and supporting evidence for your response.

Question 5.3: Do you agree with our provisional conclusion that each provider of WCT has SMP in the market served by that provider? Please set out your reasons and supporting evidence for your response.

Question 5.4: Do you agree with our provisional conclusion that each provider of MCT has SMP in the market served by that provider? Please set out your reasons and supporting evidence for your response.

6. WCT and MCT remedies

Summary

6.1 In this section, we propose remedies that we consider appropriately address the harm arising from SMP in the provision of WCT and MCT. First we assess the appropriate regulation of WCT for calls that originate within the UK, followed by the regulation of MCT for calls that terminate within the UK. We then address the regulation of international calls that terminate in the UK.

6.2 Our proposed remedies to address the SMP in WCT markets are:

a) A network access obligation on all WCT providers;

b) A charge control (without a price notification obligation) on calls originating in the UK on all WCT providers;

c) 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; and

d) For BT specifically: a requirement not to unduly discriminate, a requirement to publish a Reference Offer and financial reporting obligations.

6.3 Our proposals in relation to WCT are the same as the requirements that currently apply, other than we propose to no longer include a price notification obligation on any WCT providers, and we propose to relax the price regulation on international calls.

6.4 Our proposed remedies to address the SMP in MCT markets are:

a) A network access obligation on all MCT providers;

b) A charge control (without a price notification obligation) on calls originating in the UK on all MCT providers; and

c) 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.

6.5 Our proposals in relation to MCT are the same as the requirements that currently apply, other than we propose to no longer include a price notification obligation, and we propose to relax the price regulation on international calls.

Background

6.6 The Government has confirmed in its response to the consultation on the implementation of the EECC, published in July 2020, that the provisions of the EECC which specify EU-wide price caps for fixed and mobile termination (known as 'Eurorates') will not be implemented

in domestic law and so will not apply in the UK.[106] Given this, our expectation is that Ofcom will need to decide the appropriate price regulation which will apply to the termination rates of UK telecoms providers.

6.7 Other EU requirements on UK telecoms providers that provide relevant context to our market review include:

- **Roam like at home** – Like EU mobile operators, UK mobile operators are currently required to offer 'roam like at home' (RLAH) for their mobile customers using mobile services (roaming) in another country. RLAH means that people can use their mobiles in the EEA without paying more than they would in the UK.
- **Retail price cap on calls from the UK to the EU** – UK mobile operators are subject to a retail price cap on calls between EU countries of €0.19 per minute.

WCT non-pricing and pricing remedies

WCT network access obligation – all WCT providers

6.8 We propose to retain an SMP condition that requires all WCT providers to provide network access on reasonable request on fair and reasonable terms and conditions. This would also require all telecoms providers with SMP to provide access on fair and reasonable charges, except where a charge control applies.

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

6.10 A network access obligation would ensure telecoms providers could 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.

No renewal of requirement to notify termination charges

6.11 In the 2017 NMR Statement we introduced an obligation for all telecoms providers who hold 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.

6.12 We are now proposing to remove this notification requirement for WCT 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 and more effective, we are proposing to remove

[106] Department for Digital, Culture, Media and Sport, 2019. *Implementing the European Electronic Communications Code* (dated 16 July 2019).

this requirement. 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.

WCT charge control obligation – all WCT providers

Reason for a charge control and relevant cost standard

6.13 In the absence of price regulation, telecoms providers with SMP in WCT would have the ability and incentive to set prices 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 reducing their margins and/or leading them to increase retail prices), all of which could distort competition in retail markets and harm consumers.

6.14 Given the persistent nature of SMP in WCT markets, and the distortions caused by high FTRs, our view is that it is necessary to exercise our powers to regulate prices to promote competition in the retail markets. In this context, given that WCT is a key component of network access to secure end-to-end connectivity[107] and noting that all telecoms providers which hold geographic numbers have SMP in WCT, it would not be sufficient to rely on competition law. Price regulation allows us to intervene in a consistent and timely manner and provides legal and regulatory certainty.

6.15 In the 2019 'Future of interconnection and call termination' First Consultation (2019 First Consultation), we set out several regulatory options to address providers' ability to set excessive termination rates. In responses to the consultation no stakeholders suggested deregulation, but stakeholders had mixed views regarding the approach to regulation of WCT.[108]

6.16 Our view is that a cost-orientated price cap remains the most effective way to minimise the risk of distortions that could be caused by excessive FTRs, and the current long-run incremental cost standard (LRIC) remains the appropriate cost standard. Our reasons for this include the following.[109]

a) **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 operators. They may also increase the costs for smaller telecoms providers of competing for customer segments that make more calls than they receive.

[107] End-to-end connectivity is the ability for users to call any telephone number. We discuss this in more detail in Section 7.
[108] Responses to the 2019 First Consultation, are listed on the website for the consultation.
[109] Long Run Incremental Cost (LRIC), the cost standard currently used to set WCT and MCT termination rates, measures the incremental cost to an operator 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.

b) **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.

c) **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.

6.17 We are of the view that all providers of WCT with SMP should be subject to the same price cap, 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.

Specification of the price cap

6.18 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.[110]

6.19 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 £6m for the year ended 31 March 2019, which represents less than 0.3% of BT's fixed residential voice revenues in 2019.[111]

6.20 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.

6.21 Therefore, we consider that a price cap for the forthcoming review period, based on the 2017 WCT cost model, will be sufficient to resolve our competition concerns and so it is not necessary to undertake a new cost modelling exercise. We therefore propose to base the WCT price cap on our 2017 estimate of LRIC[112], adjusted for inflation, using the formula set

[110] 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 Prices Index as set out in conditions 5C.4 and 5C.8 from our 2017 NMR Statement.
[111] BT had fixed access and call revenues of £2.2bn in 2019, see Table 6 of Ofcom's Telecommunications Market Data update Q4 2019.
[112] Our 2017 model estimated LRIC of 0.0269ppm for the 2020/21 period in 2016/17 prices.

out in Annex 9.[113] In practice this means that the price cap will remain at a constant level in real terms over the review period.

Additional pricing and non-pricing remedies for WCT: BT only

6.22 BT is currently subject to a number of remedies for WCT that do not apply to any other telecoms provider. We propose to maintain a number of these, specifically:

- a requirement not to unduly discriminate;
- a requirement to publish a reference offer; and
- reporting obligations.

6.23 We consider that it may be appropriate to impose additional remedies on BT because of BT's scale in the provision of WCT. In the 2017 NMR Statement we found that BT's share of subscribers remained well over 50% and hence the volume of calls terminated to numbers controlled by BT exceeded that of any other fixed telecoms provider.[114]

6.24 BT's volumes of wholesale fixed lines remain relatively stable and its share of retail subscribers has remained stable since 2017. BT also retains its role as a holder of number ranges and as a donor operator for numbers that have been ported to other providers. It is therefore likely that it remains the largest supplier in terms of the number of calls terminated to fixed numbers.[115] We note that some providers are likely to move to IP-based voice services over the review period and this may cause some providers to port numbers away from BT, which would diminish its share of WCT volumes.

6.25 Our competition concern in respect of BT's SMP is that it would have the incentive and ability to set terms or prices for WCT that discriminate between telecoms providers in a way that harms competition (for example by imposing terms of supply that disadvantage certain providers). A high BT 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 downstream competition than similar conduct undertaken by other number range holders.

6.26 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 and instead propose the measures set out below in order to prevent and monitor the conduct with which are concerned.

[113] We propose that the new FTR cap would take effect from the 1st June 2021, after a 2 month implementation period, during which we propose that FTRs remain at their present level.
[114] Ofcom, 2017. 2017 NMR Statement, paragraph 13.71.
[115] BT's Regulatory Financial Statements for 2019 report that there were 15 million WLR connections of which 11.8 million were internal and 3.3 million external. This represents a 4.9% decline on the number of WLR lines compared to the same period in 2017.

Requirement not to unduly discriminate

6.27 We are currently proposing to maintain a condition on BT not to unduly discriminate in relation to the provision of WCT. However, we would welcome further evidence from stakeholders on whether this obligation remains necessary.

6.28 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. Our proposed no undue discrimination obligation is intended to prevent such conduct.

6.29 Our initial view is that the scope for such discriminatory conduct may be mitigated to a significant extent by the package of remedies we are proposing for WCT. For example, unduly discriminatory terms and conditions would be likely to 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 propose, BT is limited in its ability to discriminate on price.

6.30 We would therefore welcome evidence from stakeholders about the residual scope for unduly discriminatory conduct which would not be addressed by the other obligations. Conversely, we would also welcome evidence on the potential benefits to consumers if the obligation were removed to give BT additional flexibility in setting terms and prices.

Requirement to publish a Reference Offer

6.31 We propose to retain the condition on BT to publish a Reference Offer for its provision of WCT. We are proposing to retain the obligation to give visibility to the terms and conditions on which other providers can purchase WCT from BT, to enable faster negotiations, to minimise the risk of disputes and to facilitate monitoring.[116]

6.32 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.

[116] Section 87(6)(c) of the Act authorises the setting of SMP services conditions requiring the dominant provider to publish, in such a manner as Ofcom may direct, the terms and conditions on which it is willing to enter into an access contract. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in the Reference Offer. Section 87(6)(e) permits the setting of SMP services conditions requiring the dominant provider to make such modifications to the Reference Offer as may be directed from time to time.

Reporting obligations

6.33 We propose to impose regulatory reporting remedies in the form of accounting separation and cost accounting obligations. We set out these proposals in Section 8.

MCT remedies

MCT network access obligation

6.34 We propose 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.

6.35 In the absence of a requirement to provide network access on fair and reasonable terms, MCT providers with SMP could have an incentive and the ability to provide access subject to unfair or unreasonable terms or to refuse access to their network. This could place the originating provider at a competitive disadvantage, potentially distorting retail competition.

6.36 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.

No renewal of MTR reporting requirements

6.37 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 mobile termination rate (MTR) charged in the previous charge control year. The remedy was designed to allow us to effectively monitor compliance and enforce against telecoms providers that did not comply with the charge control.

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

6.39 We are now proposing 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 and more effective, we are proposing to remove this requirement. 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.

Financial reporting

6.40 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, noting that we have not done so in previous MCT reviews. 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.

MCT charge control obligation

Reason for a charge control and relevant cost standard

6.41 In the absence of price regulation, telecoms providers with SMP in MCT would have the ability and incentive to charge excessively high 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. We explain why this is in more detail at paragraph 6.44 below.

6.42 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 provider which hold mobile numbers have SMP in MCT, it would not be sufficient to rely on competition law. Price regulation allows us to intervene in a consistent and timely manner, and provides legal and regulatory certainty.

6.43 In the 2019 First Consultation, we set out several regulatory options to address providers' ability to set excessive termination rates. In responses to the consultation no stakeholders suggested deregulation, but stakeholders had mixed views regarding the approach to regulation of MCT.[117]

6.44 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.[118] In 2018, we concluded that these arguments remained applicable and we continue to do so. As we explained in 2015, LRIC is the most appropriate cost standard because, amongst other things:

a) **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 operators as a larger proportion of their customers' total calls are to recipients on other networks.[119] Higher MTRs would also put smaller operators at a

[117] Responses to the 2019 First Consultation, are listed on the website for the consultation.
[118] See equivalent section on WCT charge control obligation for a definition of LRIC and LRIC+.
[119] See, for example, paragraphs 101-113, 2015 MCT Market Review Statement

disadvantage when competing for customers that are net makers of calls, who tend to be higher value customers.[120, 121] 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.[122]

b) **Allocative efficiency considerations do not necessarily point to an optimal MTR which is above LRIC**. MTRs above LRIC would distort mobile operators' 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.[123]

c) **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 operators), there is no evidence that the previous reduction from LRIC+ to LRIC in 2011 was associated with lower investment.[124]

d) **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.[125]

6.45 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 operators were able to set higher MTRs while rivals were only able to set lower MTRs, this could provide the operator with high MTRs with a distortionary competitive advantage. Depending on the level of the MTR, the revenues could allow it to discount its retail offers

[120] See, for example, paragraphs 114-127, 2015 MCT Market Review Statement

[121] 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.

[122] For example, see paragraphs 6.134 to 6.151, 2015 MCT Market Review Statement.

[123] For example, see paragraphs 6.24 to 6.42, 2015 MCT Market Review Statement.

[124] For example, see paragraphs 6.63 to 6.84, 2015 MCT Market Review Statement.

[125] For example, see paragraphs 6.46 to 6.53 and 6.85 to 6.90, 2015 MCT Market Review Statement.

in a way not related to greater efficiency or the provision of a service better meeting the needs of customers.

6.46 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. 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.[126]

6.47 In conclusion, 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 therefore we propose that a charge control set at LRIC remains the appropriate cost standard.

Approach to calculating the MTR charge control

Summary of the 2020 MCT model

6.48 In order to calculate the LRIC of MCT for the purposes of this consultation, we propose to use a bottom-up cost model (the 2020 MCT model) which is published alongside this document and explained briefly in this section and in greater detail in Annex 6.

6.49 The 2020 MCT model is structured similarly to our previous bottom-up MCT models;[127] 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.[128]

6.50 We are aware that the European Commission is building its own model as part of the Eurorates project which will set a single cap on MTRs across the EU. The results of the EC

[126] 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.

[127] 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.

[128] 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.

modelling exercise are expected by the end of 2020 but are not yet available to us.[129] The purpose of the EC model, as set out in the EECC Directive, is to set *"a single maximum Union-wide mobile voice termination rate".*[130] Unlike the 2018 MCT model, it is not a model targeted uniquely at identifying an MTR cap for UK national operators.

Updates included in the 2020 MCT model

6.51 In producing the 2020 MCT model we have considered whether, and if so the degree to which, we would need to update the 2018 MCT model to produce a reasonable estimate of the LRIC of MCT over the 2021/22 to 2025/26 control period. We have had particular regard to:

a) the degree of accuracy required to achieve our regulatory aims;

b) the accuracy and relevance of the 2018 MCT model; and

c) the data gathering requirements of any updates, particularly with regard to the regulatory burden this would place on our stakeholders.

6.52 As a result, we have updated the 2018 MCT model in the following ways (see Annex 6 for a more detailed discussion of each point):

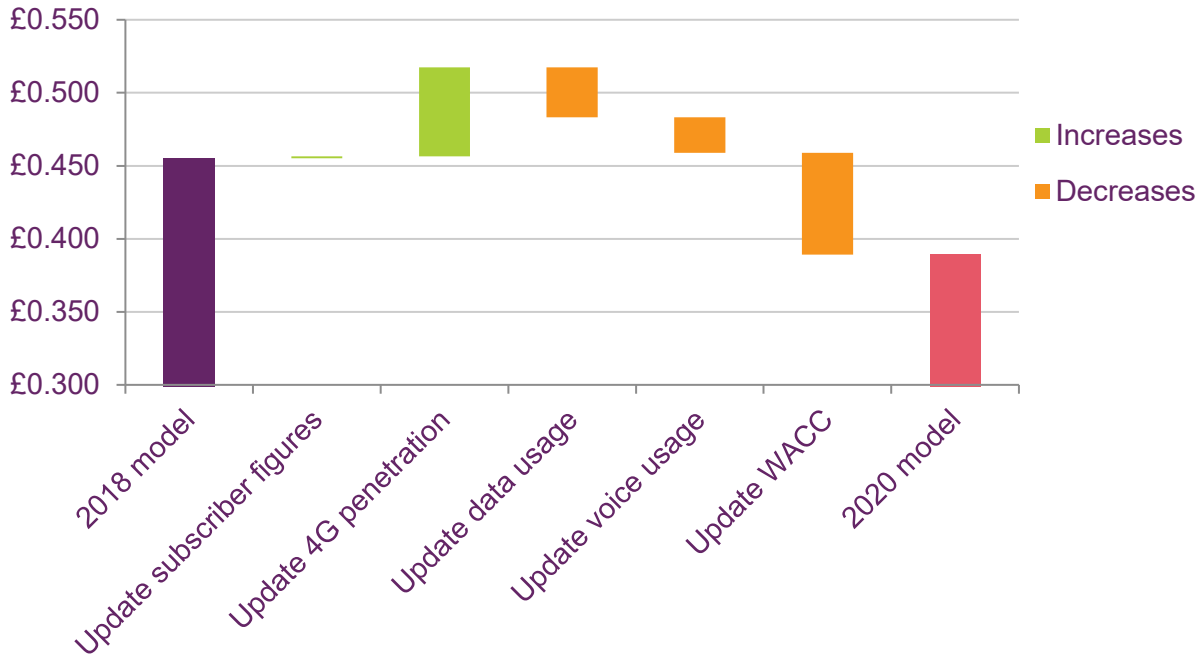
a) **Traffic volumes:** We have updated handset and data device subscriber figures, 4G penetration rates, 4G data usage (to ensure total data usage is consistent with the increase in modelled 4G penetration), and monthly voice usage. Taken together, these updates slightly increase the output LRIC of MCT.

b) **Cost of capital:** We have updated the WACC assumption used in our model on a forward-looking basis to reflect our latest view.[131] This has reduced the pre-tax real WACC from 7% (as in the 2018 MCT model) to 5.8%, which reduces the output LRIC of MCT.

6.53 Overall, the combined impact of the traffic volume updates and the updated WACC result in a 2021/22 MCT LRIC of 0.389ppm, as compared to 0.455ppm from the 2018 MCT model (updated to 2020/21 real prices). We show the breakdown of each of our updates in the chart below:

[129] Further information regarding this model and process can be found online at the European Commission's website [Accessed 7 August 2020]
[130] Article 75 of the European Electronic Communications Code, available online [Accessed 7 August 2020]
[131] We are using the 'Other UK Telecoms' rate set out in the 2020 WFTMR Consultation. See Table A21.1, Annex 21.

Figure 6.1: Impact of updating the 2018 MCT model, 2020/21 real ppm



Source: 2020 MCT model

6.54 We have also conducted some further calibration cross-checks of the 2020 MCT model using stakeholder data gathered as part of the EU's Eurorates modelling. We have found that, while the model does not perfectly match stakeholder data regarding asset counts and gross book value costs, the output network is broadly in line with stakeholder data and does not appear to systematically generate higher or lower values.

Our approach to updating the MCT model

6.55 The updates we have made to improve the accuracy of the 2020 MCT model are shown above. We have not performed a comprehensive update the model and we are conscious that the architecture of the 2018 MCT model and some of the data underlying it are now at least five years old. In particular, the model does not account for 5G and Voice-over-WiFi (VoWiFi) technologies.

6.56 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 time [132], even changes to the current MTR that are proportionally quite large are still very small in 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.[133]

[132] 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.
[133] 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 £13.4bn. Source: quarterly data telecoms tables.

6.57 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.

6.58 Furthermore, 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 minimize 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.[134]

6.59 A case-by-case discussion of each of the main elements of the 2020 MCT model is included in Annex 6.

Range of MCT rates we are consulting on

6.60 Based on the 2020 MCT model, we are consulting on the following range of MTRs:

Table 6.2: Current MTR, and forecast LRIC of MCT and consultation range (real 2020/21 ppm)[135]

	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					
Base case cost		0.389	0.379	0.384	0.390	0.394
Range		0.257 - 0.485	0.257 - 0.466	0.274 - 0.464	0.294 - 0.462	0.313 - 0.460

Source: 2020 MCT model.

6.61 We propose that the new MTR would take effect from 1 June 2021 after a two-month implementation period during which we propose MTRs remain at their present level.

[134] Our position is set out in a letter we issued to industry.

[135] We note that for the low scenario there is a significant dip in MTRs followed by a consistent increase (and this occurs to a lesser extent in the base case). This is due to economic depreciation (specifically the recovery of opex over time). We note that this modelling feature was previously appealed in the Competition Appeal Tribunal in 2011 but this particular challenge was unsuccessful. See British Telecommunications Plc v Competition Commission [2012] CAT 11

WCT and MCT regulation on international calls

Background

6.62 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.[136] However, we did not rule out the possibility that we would exercise our power to apply a different level of regulation to certain calls, if circumstances justified a different approach.

6.63 Currently, countries within the EEA, including the UK, charge the same rates for calls originating in the EEA and in the UK as for domestic calls. However, the application of the current EU framework relevant to termination rates will end with the transition period on 31 December 2020. There are ongoing negotiations between the UK Government and EU which might have a bearing on the regulatory framework.

6.64 Increasingly, countries within the EEA allow their telecoms providers some form of pricing flexibility for termination charges for calls originating outside the EEA (we refer to these as 'non-EEA calls'). Of the NRAs that responded to our questionnaire, five NRAs (France, Germany, Ireland, Portugal, and Spain) stated that they applied a form of reciprocity, and 11 stated that domestic telecoms providers were free to negotiate prices commercially with non-EEA telecoms providers. None of the NRAs that responded to our questionnaire told us they apply a single price termination rate on all calls.

6.65 We have therefore 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 consider price regulation on all international calls, recognising that this may or may not apply to EEA calls depending on the outcome of the UK Government's negotiations with the EU.

Analysis and preferred approach

6.66 In this section, we assess which approach to regulation of international call termination is likely to be in the best interests of UK consumers.

6.67 In order to do this, we first set out how termination rates affect UK consumers. We explain why the optimal outcome for UK consumers would be where both parties charge low termination rates (we refer to this as 'reciprocal low termination rates'). We also explain why, in the event that international telecoms providers charge high rates for calls from the UK, it is not clear whether UK consumers would be better or worse off if UK telecoms providers were able to increase termination rates on international calls.

6.68 Although we cannot directly control the termination rates charged by providers abroad for calls that originate in the UK, our approach to regulation of termination rates charged by

[136] We assessed the impact of setting differential termination rate regulation, which would have allowed operators to increase termination rates on calls originating outside of the EEA. However, we concluded that the extent of the benefit to UK consumers was uncertain and seemed unlikely to be significant given the sums involved.

UK telecoms providers on international calls may have an influence on international telecoms providers' ability and incentive to charge high rates for calls from the UK. To the extent that our regulation indirectly results in lower termination rates charged by international telecoms providers, UK consumers would benefit.

6.69 We assess three options for the regulation of termination rates for calls from outside the UK:

a) Maintain current regulation, in which termination rates charged by UK telecoms providers for international calls are capped at the domestic termination rate.

b) Pricing freedom, in which there is no price cap on termination rates for international calls.

c) Reciprocity, 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 telecoms provider's domestic rate, whichever is the higher.

6.70 We conclude that a reciprocity condition is likely to deliver the best outcome to UK consumers.

6.71 The views and analysis apply to both fixed and mobile call termination, and to all international calls (EEA and non-EEA), unless we specify otherwise.

How termination rates affect UK consumers

High termination rates on UK calls to international destinations

6.72 High termination rates charged by international telecoms providers on calls from the UK would harm UK consumers in the following ways:

a) **Higher retail prices for international calls**: High termination charges for calls to international numbers increase the cost of providing international calls and could result in higher retail prices for UK consumers making international calls than if termination rates were low.

b) **In relation to mobile termination rates charged by EEA telecoms providers, 'roam like at home' (RLAH) in the EEA could come under pressure**: if termination rates for calls from the UK to the EEA increase, this would raise the cost of providing a RLAH service to UK consumers when travelling in the EEA. Under a RLAH arrangement subscribers pay the same charges when roaming abroad as they would if they were at home, so UK mobile operators would not be able to pass those increased costs onto users. The obligation for UK operators to offer RLAH to their customers while roaming in the EEA appears likely to fall away on 31 December,[137] but given the value of RLAH to customers, we expect UK operators to still have an incentive to offer it on a

[137] Government advice, Visit Europe from 1 January: "the guarantee of free mobile phone roaming throughout the EU, Iceland, Liechtenstein and Norway will end. Check with your phone operator to find out about any roaming charges you might get from 1 January 2021."

commercial basis. However, in a scenario where there is no EU-UK agreement on RLAH, and if the costs of offering RLAH become unsustainable to UK operators, they could stop providing RLAH and begin charging customers for calls and data used while roaming in the EEA, to the detriment of those customers.

6.73 As a result, in our view, UK consumers are better off if international telecoms providers charge low termination rates on calls originating in the UK. Accordingly, to the extent that our regulation indirectly results in international telecoms providers setting lower termination charges for UK originating calls, UK consumers will benefit.

High termination rates on calls received from abroad

6.74 Higher termination charges for international calls that terminate in the UK could have both positive and negative impacts on UK consumers:

a) **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').

b) **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.

6.75 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.[138] The underlying theory is that if high mobile termination charges lead to greater profits for mobile operators, 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.[139] High termination rates charged by mobile operators to fixed operators are analogous to high termination rates charged by UK telecoms providers on

[138]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 operators to fixed operators 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.*"

[139]Genakos and Valletti found that using data from 2002 to 2006, when revenues from termination rates charged to fixed operators were high, there was a significant negative relationship between termination rates and mobile prices. This relationship became insignificant when an extended dataset from 2002-2011 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 (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.

international calls, as high termination profits could provide an incentive for UK telecoms providers to charge lower retail prices, in particular for customers that are likely to receive such calls.

6.76 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 harm UK consumers.[140] 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 are able to switch to OTT, and how much UK consumers value those calls.

Overall consumer impacts

6.77 We are of the view that scenarios where both the UK and international telecoms provider charge low termination rates ('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, minimise pressure on RLAH arrangements. 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.

6.78 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 RLAH arrangements.

6.79 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). The magnitude of both of these effects is difficult to determine.[141]

Analysis of options for future regulation of international calls

6.80 There are three options that we are considering for our approach to regulation:

[140] 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.
[141] We do not consider a scenario where UK termination rates on international calls are high whereas the counterparty charges low rates to the UK, as this scenario is unlikely in most cases (other than where international operators are subject to a price cap on all calls regardless of origin), and this would make little difference to our analysis.

a) **Option 1: maintain current regulation** – UK telecoms providers must set the same, low, termination rate for all calls regardless of origin.

b) **Option 2: do not regulate termination rates for international calls** – UK telecoms providers are able to set termination rates for calls that originate outside the UK at any level they choose.

c) **Option 3: introduce a reciprocity condition** – the termination rate charged by the UK telecoms provider cannot be higher than the rate charged to the UK telecoms provider by the international telecoms provider (unless the rate charged to the UK telecoms provider is lower than the domestic price cap, in which case the price cap on UK calls applies).

6.81 In this section, we assess the incentives of UK and international telecoms providers under each option to determine which option offers the best chance of reciprocal low termination rates, as reciprocal low termination rates benefit UK consumers.

Option 1: current approach

6.82 Under this option, telecoms providers in countries that allow pricing freedom would be able to exploit their SMP in termination and charge high termination rates for calls from the UK, without that provoking a response from UK telecoms providers. We consider that this would provide a strong incentive for telecoms providers in countries with pricing freedom to charge high rates for calls from the UK and would therefore be likely to deliver the low-high scenario that we describe above.

6.83 Overseas telecoms providers subject to a reciprocity condition or required to charge low termination rates for international calls would not be able to increase termination rates to any material degree, given that UK rates are currently low. This would deliver reciprocal low rates, and be optimal for UK consumers.

Option 2: Pricing freedom

6.84 Under this option, telecoms providers in countries that allow pricing freedom would not be able to charge high termination rates for calls from the UK without that provoking a response from UK telecoms providers. This would reduce the incentive of telecoms providers in countries with pricing freedom to charge high rates for calls from the UK (a benefit in comparison to Option 1). However, unlike option 1, UK telecoms providers could also charge high rates and provoke a response from the counterparty. If either party preferred reciprocal high rates over reciprocal low rates, this would be the likely outcome.[142]

6.85 In addition, UK telecoms providers would be able to increase rates and provoke a response from counterparties subject to a reciprocity condition, which would increase the likelihood of reciprocal high rates with those telecoms providers (a disadvantage in comparison to Option 1).

[142] It is likely that the best response of an operator faced with high termination rates would be to raise its own rates in return.

Option 3: reciprocity

6.86 We are of the view that Option 3 offers the best chance of low termination rates by combining the positive aspects of both Options 1 and 2.

6.87 Similar to option 2, a reciprocity condition would reduce the incentive for international telecoms providers with pricing freedom to charge high rates on calls from the UK in comparison to option 1, as doing so would be likely to provoke a response from the UK telecoms provider. However, unlike option 2, UK telecoms providers would not be able to increase their rates unilaterally (and thereby provoke a response from their counterparty) and reciprocal high rates would only arise if driven by the international telecoms provider.

6.88 Similar to option 1, given that UK rates will be low when the new regulation comes into force, UK telecoms providers would not be able to increase their rates in respect of telecoms providers already subject to a reciprocity condition or a low charge control, and reciprocal low rates would be guaranteed in those cases. However, option 3 is better than option 1 because it is more likely to lead to reciprocal low rates where counterparties have pricing freedom. Even where reciprocity leads to reciprocal high rates, customers would be no better or worse off than they would under option 1.

6.89 We therefore consider a reciprocity condition would either lead to either similar or better outcomes for UK consumers than the other two options.

Likelihood of a reciprocity condition leading to reciprocal low rates

6.90 The analysis above explains that a reciprocity condition would offer the best chance of reciprocal low rates. However, where international telecoms providers have pricing freedom, they would need to prefer reciprocal low rates over reciprocal high rates, for reciprocal low rates to be the outcome. This section considers the different incentives, and the likelihood of reciprocal low rates with telecoms providers that have pricing freedom on international calls.

6.91 Whether a telecoms provider prefers reciprocal high rates or reciprocal low rates will in part depend on the balance of traffic between to the two parties:

a) The telecoms provider that is the net-receiver of calls will prefer reciprocal high rates, as the amount it receives in termination charges will be greater than the amount it pays to the counterparty, and high termination rates would therefore increase net termination revenues.

b) The telecoms provider that is the net-sender of calls will prefer reciprocal low rates as this would reduce its net termination costs.[143]

[143] A change in the termination rate by either party may lead to demand response, which could also affect incentives. As we discuss above, an increase in UK termination rates could reduce the demand for calls to the UK. This would tend to increase the traffic outflow from the UK to other country. The same could happen if international telecoms providers reduced their termination rates.

6.92 Therefore, if the counterparty is a net-sender of calls to the UK, it will prefer reciprocal low rates. If the counterparty is a net-receiver of calls from the UK, it will have an incentive to charge high rates on calls from the UK, even if the UK telecoms provider is able to respond by increasing its rates.[144]

6.93 However, the balance of traffic may not be the only factor in influencing incentives. Even if the international telecoms provider is a net-receiver of calls from the UK, there may be incentives to reach (where the telecoms provider currently charges high rates) or maintain (where the telecoms provider currently charges low rates, for example in the EEA) a reciprocal low outcome, particularly where call volumes are not that dissimilar and the gain from reciprocal high rates compared to reciprocal low rates is small. For example:

a) High termination rates may create distortions in the market in comparison to low termination rates, which may reduce overall profits. For example, lower termination rates on international calls could enable telecoms providers to charge lower retail prices to their mutual benefit.

b) Roaming agreements, particularly in the EEA where roaming is more prevalent, may provide an incentive to continue to charge low rates where they are currently low. Roaming agreements require negotiation not only on wholesale call charges, which take termination rates into account, but also texts and data. Increases in termination rates would be likely to require renegotiations which would take time and could risk destabilising mutually beneficial agreements.[145]

6.94 Conversely, for international telecoms providers already charging high termination rates to the UK, there may be practical difficulties in reaching a reciprocal low outcome even if they have the incentive to do so. For example, there may be costs associated with reducing termination rates to UK telecoms providers while maintaining high rates with other countries, and some non-EEA telecoms providers have price floors on the termination rates they can charge.[146] In practice, we are aware that where telecoms providers within the EEA have been allowed more pricing freedom on non-EEA calls, in many cases, the result has not been reduced termination rates; instead, they have increased termination rates.[147]

6.95 In summary, where international counterparties have pricing freedom, it is difficult to estimate the extent to which a reciprocity condition could lead to reciprocal low rates. However, we are of the view that reciprocal low rates are more likely under a reciprocity condition than under any alternative approach, and are plausible in certain scenarios (for example, where traffic is roughly balanced and telecoms providers have the incentive to maintain roaming agreements). Although the outcome with these telecoms providers

[144] As a result of delays to information requests as a result Covid-19, we do not have data on the balance of traffic between the UK and other countries.
[145] This could happen, for example, if agreements on data charges (which account for the majority of costs of roaming agreements) were also destabilised, or if roaming agreements became too costly for either operator to offer RLAH.
[146] 2018 MCT Market Review Statement, footnote 85
[147] We understand this from the questionnaire we sent NRAs.

could also be reciprocal high rates, we consider this no worse than if we were to maintain the current approach to regulation.

Provisional conclusions

6.96 In our view, reciprocal low rates would lead to the best outcomes for UK consumers. They would result in the lowest prices for UK consumers making international calls, minimise pressure on RLAH arrangements, and enable a high number of calls to the UK.

6.97 A reciprocity condition offers the best chance of reciprocal low rates:

a) Where international counterparties are subject to a reciprocity condition or low price cap, a reciprocity condition would guarantee reciprocal low rates; and

b) Where international counterparties have pricing freedom, they will have a lower incentive to charge high termination rates to the UK than under the current approach.

6.98 For those telecoms providers that will charge high termination rates on calls from the UK regardless of our approach to termination, it is difficult to determine whether a reciprocity condition (which would lead to reciprocal high rates) or maintaining current regulation (which would lead to the low – high scenario), would deliver a better outcome for UK consumers overall.

6.99 On balance, therefore, our preferred approach is reciprocity.

Implementation of a reciprocity regime

6.100 We are proposing that the reciprocity obligation be imposed on a 'per operator' basis. This would prevent any UK telecoms provider from charging a higher termination rate than that which it is charged by an international telecoms provider with which it is engaging, unless the termination rate is charged is lower than the UK termination rate on domestic calls. This approach is similar to the approach currently applied to non-EEA calls by the German, Spanish, and Italian NRAs. We set out more detail on how this would work in practice in Annex 9.

6.101 Depending on the outcome of the UK Government's negotiations with the EU on the future trade relationship, our reciprocity regime may apply to all international countries, or to non-EEA countries only.

6.102 In addition, depending on the outcome of the UK Government's negotiations with the EU on the future trade relationship, telecoms providers in the EEA may be able to increase termination rates they charge on UK calls after the end of the Brexit transition period. Therefore, there may be a period between 1 January and 31 March 2021 in which EEA telecoms providers would be able to increase termination rates on UK calls, and UK telecoms providers would not be able to respond by increasing their rates. We do not think this is likely to have a significant effect such that it requires us to bring regulation on international call termination forward, as we consider that EEA telecoms providers would be likely to take into account UK telecoms providers' pending ability to retaliate to high rates when deciding whether to increase their rates.

Consultation questions

Question 6.1: Do you agree with our proposal to maintain a network access obligation on all WCT providers? Please provide reasons and evidence in support of your views.

Question 6.2: Do you agree with our proposed remedies that would be specific to BT's provision of WCT? We welcome evidence on all aspects of our proposals and in particular whether we should maintain BT's obligation of no undue discrimination. Please provide reasons and evidence in support of your views.

Question 6.3: Do you agree with our proposed charge control on WCT and the analysis that informed this proposal? Please provide reasons and evidence in support of your views.

Question 6.4: Do you agree with our proposal to maintain an access obligation on all MCT providers? Please provide reasons and evidence in support of your views.

Question 6.5: Do you agree with our proposed charge control on MCT and the analysis that informed this proposal? Please provide reasons and evidence in support of your views?

Question 6.6: Do you agree with our proposal to introduce a reciprocity condition on the termination of international calls and the analysis that informed this proposal? Please provide reasons and evidence in support of your views.

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 provisional determination that all providers have SMP in WCT in each market applicable to that provider, 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 on our proposed interconnection remedies of the forthcoming migration of voice services from the current, time division multiplexing technology (TDM networks) to modern internet protocol (IP) networks.

7.3 In view of the particular characteristics of BT's SMP, we are proposing to apply specific interconnection remedies to address its SMP in the WCT market. These remedies are summarised in Figure 7.1 below. Given the industry migration to IP-based technology planned in this market review period, we propose to regulate BT's IP interconnection services and maintain current regulation until 1 April 2025 on its TDM interconnection circuits.

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

Remedy	Proposals for 2021-2026		Decision in Narrowband Market Review (2017)	
Type of interconnection	**TDM**	**IP**	**TDM**	**IP**
Network access obligation	✓	✓	✓	
Requirement not to discriminate unduly	✓	✓	✓	
Publish a reference offer	✓	✓	✓	
Requirement to notify charges	✓	✓	✓	
Accounting separation	✓	✓	✓	
Cost accounting	✓	✓	✓	
Transparency as to quality of service	✓	✓	✓	
Charge control on TDM interconnect circuits	✓		✓	
Fair and reasonable charges obligation for IP interconnection, supplemented by guidance		✓		
Prohibition of additional charges		✓		
Transparency obligation concerning BT's timetable for migration of point of connections (POCs) for WCT to its IP network		✓		

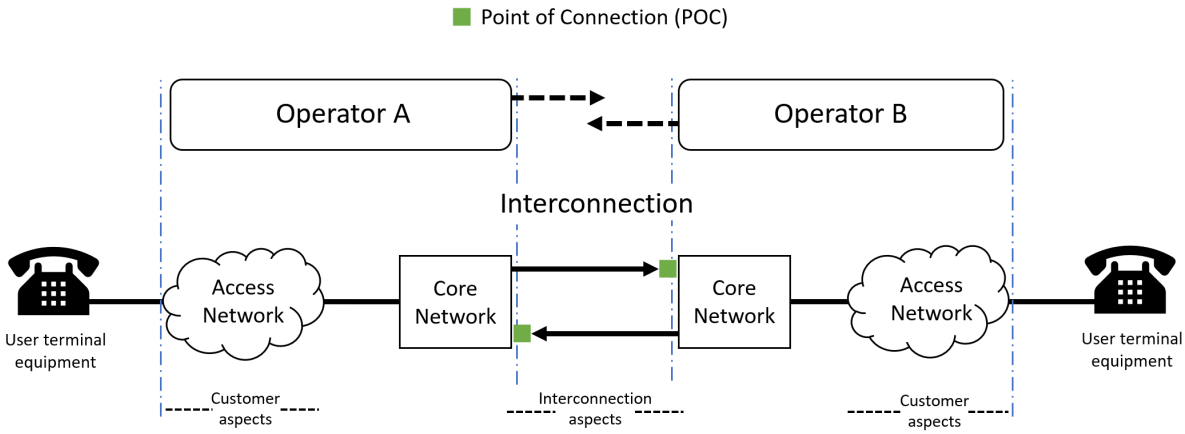
7.4 For telecoms providers other than BT, we are not proposing any specific interconnection remedies, other than the network access condition, which requires telecoms providers to provide such associated facilities as are reasonably necessary and requires those facilities to be provided on fair and reasonable terms, conditions and charges.

Overview of interconnection

7.5 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.[148]

7.6 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.

Figure 7.2: Interconnection and termination



Source: Ofcom.

Interconnection technology

7.7 Traditionally, fixed telephone services in the UK have been provided using dedicated circuit-switched telephone networks, which make use of TDM networks. However, over the last decade, a technology transition has been underway as telecoms providers have begun to transfer services to modern IP networks which use a common infrastructure for both broadband and telephone services.

[148] All telecoms providers have obligations related to interconnection under 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."

7.8 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, prompted in part by Openreach's plans to withdraw its copper access network (known as 'copper switch-off'), telecoms providers have sought to deliver telephone services to customers premises over broadband connections (sometimes referred to as 'all-IP').

7.9 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, this transition will enter a second phase as the remaining telecoms providers transfer their fixed line telephone services to IP networks.

Wholesale call termination on TDM networks

7.10 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.

7.11 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. 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 FTR.

7.12 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

7.13 In contrast to TDM networks, IP networks are multipurpose networks which 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.[149]

7.14 IP network architecture differs from that of TDM networks in two other important respects that are relevant to interconnection and WCT:

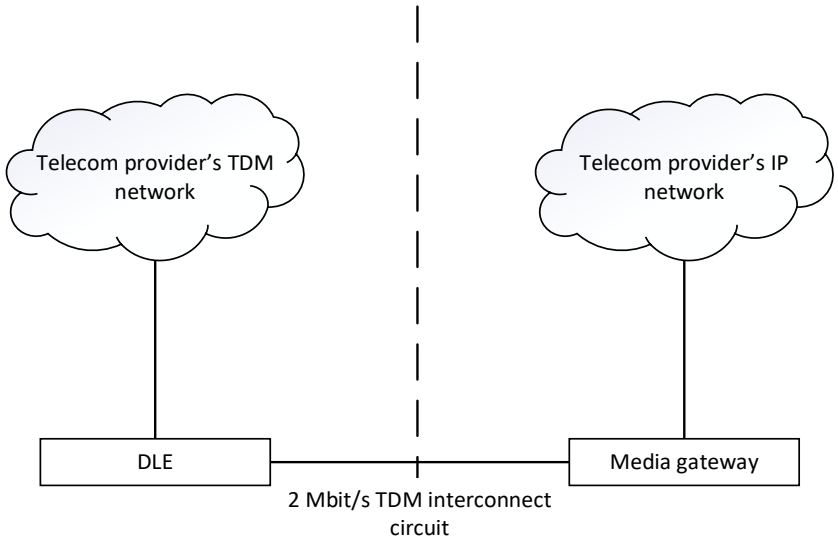
- IP networks typically have a small number of points of connection (POC) located at core network nodes, which are remote from most end-users' fixed lines. For example, while BT's TDM network has over 600 DLEs in its TDM network, it has around 15 points of interconnection to its IP network. It also permits interconnection via internet peering or via an internet peering partner.[150]
- 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.

7.15 Consequently, some telecoms providers make WCT available at multiple POCs.

Interconnection between TDM and IP networks

7.16 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.

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



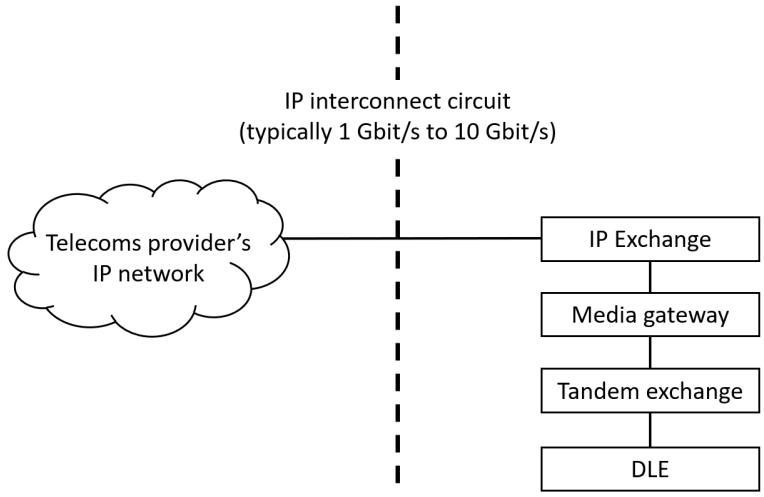
Source: Ofcom.

[149] Telephone services are controlled by network elements known as call servers which are responsible for call setup and cleardown. 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.

[150] See Appendix A of BT's 'IP Exchange Technical Description' version 6.5 from the BT Wholesale website (login required in order to access),

7.17 A telecoms provider with an IP network wishing to terminate geographic calls on BT's 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

7.18 Openreach plans to withdraw WLR services by 2025 in preparation for the withdrawal of BT's TDM Network.

7.19 For interconnection purposes, calls will continue to be routed between networks on the basis of number block allocations.[151] 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.[152] In order to access WCT, other telecoms providers would then reconfigure their networks to route calls to the number blocks in question to BT's IP network.

7.20 We discuss BT's plans for interconnection migration in more detail later in this section.

[151] Telecoms providers obtain 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.

[152] BT currently provides WCT at all of its IP network POCs – see paragraph 7.25 below.

Overview of interconnection services provided by BT

7.21 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.

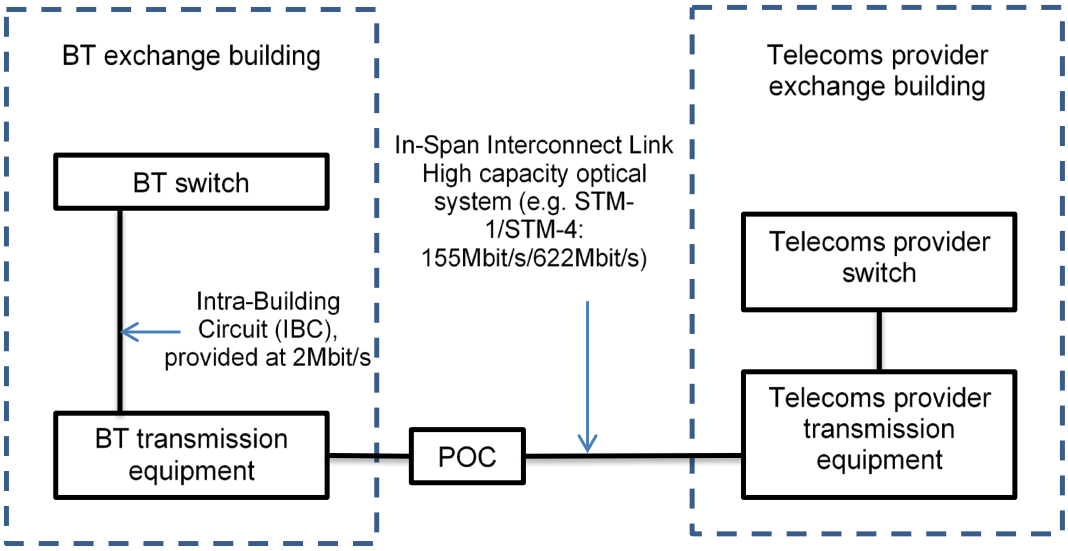
TDM interconnection

7.22 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.
- **Virtual Interconnect Circuits (VICs)**: VICs[153] require customers to interconnect using ISI or CSI to a tandem exchange where BT then provides a 'virtual' circuit using the existing BT network to connect to another BT exchange (e.g. a DLE).

[153] 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).

Figure 7.5: ISI Link Architecture



Source: Ofcom.

IP interconnection

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

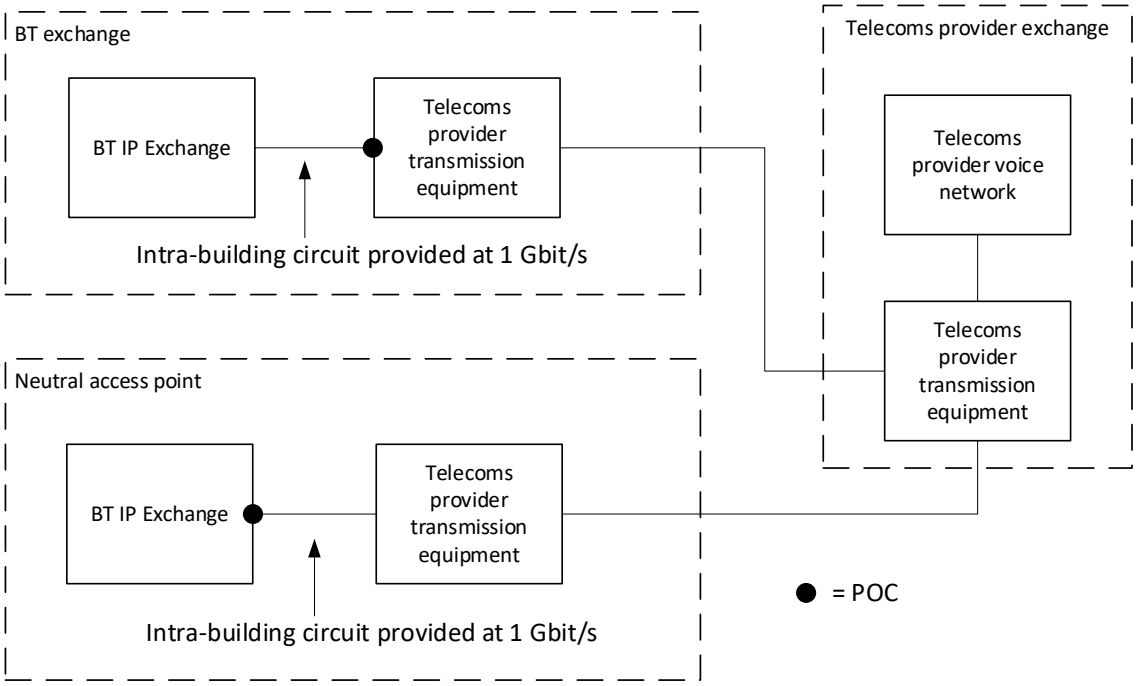
- **Direct access at BT exchanges:** a telecoms provider builds its own network to one of the exchanges at which BT provides IP interconnection. The POC is the telecom provider's network terminating equipment (NTE) located in the co-location area of the exchange. BT provides a fibre intra-building circuit for the provider to plug into its IPEX 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.

7.24 Figure 7.6 below illustrates the direct access configurations.

7.25 For number blocks residing on its IP network, BT currently provides WCT at all of the direct access POCs and via indirect access.

7.26 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.

Current regulation

7.27 In the 2017 Narrowband Market Review, we defined interconnection as the linking (whether directly or indirectly by physical or logical means) of one network and another, enabling end-users of different networks to communicate with one another and to access services provided on a different network.[154]

BT

7.28 In the 2017 Narrowband Market Review we found that BT had SMP in the provision of WCT and WCO in the UK excluding the Hull Area. 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:[155]

- 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.

[154] Ofcom, 2017. *2017 Narrowband Market Review: Statement* (2017 NMR Statement) Annex 2.
[155] 2017 NMR 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.[156] 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[157]

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) comprising of: • A cap on the interconnect services basket at CPI+0% annual change in the basket price; and • Sub caps on individual ISB services at +10% on top of the ISB cap (i.e. CPI+10%)

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.[158]

Providers other than BT

7.31 While we recognised that providers other than BT had SMP in WCT and WCO, we did not impose specific regulation on their interconnection circuits (with the exception of KCOM)[159]. 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.[160]

[156] 2017 NMR Statement, paragraphs 17.109-17.111.
[157] 2017 NMR Statement, Sections 17, 18 and 19.
[158] Ofcom, 2017. Narrowband Market Review: Statement, paragraphs 17.86 to 17.91 and footnote 771.
[159] In the 2017 Narrowband Market Review we also imposed interconnection remedies on KCOM in the Hull area, due to its SMP in WCO. For a discussion of the transitional interconnection remedies specific to KCOM from April 2021, please see the 2020 Hull Review Consultation, Volume 3, Section 5.
[160] 2017 NMR Statement, paragraphs 17.114-17.115.

Competition concerns

7.32 In order to obtain WCT, telecoms providers require interconnection. They may also require other associated facilities such as accommodation in connection with the provision of interconnection.

7.33 Absent regulation, there is a risk that telecoms providers providing WCT could leverage their SMP into the provision of interconnection and other associated facilities, thereby undermining the effectiveness of the WCT remedies.

BT

7.34 Two of the factors that led us to impose regulation on BT's TDM interconnection in the Narrowband Market Review (2017) will change during this market review period as a result of BT's plans to withdraw its TDM network.

7.35 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.

7.36 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.

7.37 However, these changes will not have fully played out until towards the end of the market review period. Telecoms providers will therefore be reliant on TDM interconnection to a significant extent for much of the market review period.

7.38 These developments suggest that the scope for BT to leverage its SMP into interconnection may reduce somewhat by the end of the market review period. They do not however eliminate the scope for harm as telecoms providers will still be dependent on interconnection and other associated facilities supplied by BT to obtain WCT. 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 effect on downstream competition than similar conduct undertaken by other telecoms providers.

7.39 In view of this, we consider that absent regulation, our concerns that BT could frustrate competition could also arise in relation to BT's provision of interconnection and other associated facilities which telecoms providers require in order to obtain WCT. Relatedly

there is also a risk that uncertainty about BT's migration plans or unexpected changes to those plans could also frustrate competition.

7.40 The majority of respondents to the 2019 First Consultation believed that BT would continue to be able to leverage its SMP in WCT and WCO into interconnection during migration and potentially afterwards. All respondents supported the retention of regulation of TDM interconnect circuits until BT has completed its migration. Most thought it would also be necessary to regulate BT's IP interconnection at least until migration is complete.

7.41 To effectively address our concerns, during this market review period, in broad terms we propose to:

- Maintain the current package of remedies which applies to BT's provision of TDM interconnection;
- 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 to address the competition concerns that may arise as a result of the transition from TDM to IP.

7.42 To achieve these aims, we propose that BT should be required to provide such associated facilities as are reasonably necessary for the provision of WCT, where such services include interconnection and accommodation. The obligation would apply generally to the provision of network access and would 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. The provision of such services would be subject to the remedies discussed below.

Non-pricing remedies specific to BT

Requirement to provide network access on reasonable request

7.43 The proposed network access condition for WCT encompasses associated facilities and so requires BT to meet reasonable requests to provide interconnection and accommodation and 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 proposals to set a charge control for BT's TDM interconnect circuits below. We also set out our proposed guidance as to how the obligation to have fair and reasonable charges should apply to BT's IP interconnection services.

7.44 This remedy is necessary as BT could have an incentive not to provide interconnection and accommodation on a fair and reasonable basis,[161] which would reduce the effectiveness of the remedies we have proposed on BT for WCT. The ability of competing telecoms

[161] 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.

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.

Requirement not to unduly discriminate

7.45 We are currently proposing a condition requiring BT not to unduly discriminate in relation to the provision of interconnection and accommodation. However, we would welcome further evidence from stakeholders on whether this obligation remains necessary.

7.46 Where dominant providers are vertically integrated like BT, they may have the incentive to provide network access on terms that disadvantage downstream rivals or to discriminate selectively between competing providers. Our proposed no undue discrimination obligation is intended to prevent such conduct.

7.47 Our initial view is that the scope for such discriminatory conduct may be mitigated to a significant extent by the package of remedies we are proposing for interconnection and accommodation services.[162] 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. Moreover, as discussed above, IP interconnection is significantly simpler and less costly than TDM interconnection, suggesting that the overall scope for harm from unduly discriminatory conduct will reduce over the market review period.

7.48 We would therefore welcome evidence from stakeholders about the residual scope for unduly discriminatory conduct which would not be addressed by the other obligations. Conversely, we would also welcome evidence on the potential benefits to customers if the obligation were removed to give BT additional flexibility in setting terms and prices.

Transparency requirements

7.49 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. In the following sub-sections, we discuss the requirements to publish a Reference Offer, to notify changes to charges, and to provide transparency as to the quality of service.

Publish a Reference Offer

7.50 We propose a condition which would require BT to publish a Reference Offer for its provision of interconnection and accommodation. The main reasons for requiring the publication of a Reference Offer are to give certainty about the terms and conditions on which providers can purchase wholesale access services and, by enhancing transparency,

[162] 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.

to reduce the risk of potential anti-competitive behaviour. The publication of a Reference Offer therefore helps to ensure stability in markets and ensures that incentives to invest are not undermined.

7.51 Additionally, the publication of a Reference Offer allows for faster negotiations and can help to avoid possible disputes. Where a non-discrimination requirement applies, as we are proposing to apply to BT, the publication of a Reference Offer gives confidence to those purchasing wholesale services that they are being provided on non-discriminatory terms.

7.52 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, 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

7.53 We propose 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 propose to maintain the current 56-day notice period.

7.54 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.

7.55 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

7.56 We propose that BT should be required to provide transparency as to the quality of service (QoS) for its provision of interconnect circuits.

7.57 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.

7.58 This remedy would help monitor whether any undue discrimination is occurring by requiring the publication of data regarding the delivery of wholesale services by BT to other third-party telecoms providers. In relation to interconnect circuits, BT may seek 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.

7.59 We propose 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.

7.60 We also consider that BT should be required to publish data on a set of KPIs in relation to the provision of IP interconnection. Our initial view is that these should be broadly comparable to those for TDM interconnection, encompassing provisioning, repair and Data Management Amendments. We propose to include a KPI for port capacity orders as such orders are likely to be a significant element of IP interconnect provisioning. We therefore propose that BT should be required to publish data on the following KPIs in relation to the provision of IP interconnection to all telecoms providers (as an aggregate figure). Those KPIs are:

a) Percentage of Completed Orders for interconnect circuits that were completed by the Contract Delivery Date during the Reporting Period.

b) Percentage of Completed Orders for port capacity that were completed by the Contract Delivery Date during the Reporting Period.

c) Average time (in hours) during the Reporting Period for BT to achieve Restored Service after a fault has been registered.

d) Total number of Committed Orders that became Completed Orders during the Reporting Period.

e) Total number of Completed Orders for port capacity that were completed by the Contract Delivery Date during the Reporting Period.

f) Number of faults where BT subsequently achieves Restored Service during the Reporting Period.

g) Percentage of Data Management Amendments for new numbers that become Completed Orders during the Reporting Period.

h) Total number of Data Management Amendments for new number ranges that became Completed Orders during the Reporting Period.

7.61 We plan to refine these proposals in light of responses to this consultation.

Regulatory financial reporting requirements

7.62 These requirements include accounting separation and cost accounting obligations. We cover these proposals in Section 8.

New requirements for transparency on BT's migration timetable

7.63 As noted above BT intends to transfer its fixed line telephone services to its IP network by 2025. Other telecoms providers with TDM fixed networks are expected to transfer their fixed line telephone services to IP networks over a similar period.

7.64 Telecoms providers will need to work together to co-ordinate the progressive migration from TDM interconnection to IP interconnection. BT's plans are a major component of this transition because it is the largest provider of fixed call termination. Therefore, we are proposing that BT should be subject to additional requirements to ensure the transparency of its migration timetable.

BT's proposed timetable for the migration of its POCs for WCT

7.65 Openreach has announced that it will withdraw its WLR and ISDN products by 2025 in preparation for the withdrawal of BT's TDM network.[163] As a result, 16 million lines and channels will have to be migrated to IP networks. 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

[163] Openreach's website outlines the timeline for the withdrawal of WLR products [Accessed 30 July 2020]

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.

7.66 BT has shared a draft plan for its number block migration programme with telecoms providers and is currently seeking feedback.[164] BT envisages that the migration programme would proceed on a DLE by DLE basis, over a period of 12-18 months commencing around early 2023. The POC for number blocks would therefore be re-designated from multiple DLEs to BT's IP network POCs each month.

7.67 BT proposes to publish a migration timetable which would be updated monthly during the migration programme. Under its proposed timetable, it will provide 12 months' 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, at which point BT says that the date would not be changed.

7.68 To help ensure an orderly migration, BT also proposes that it would provide WCT at the relevant DLE as well as at the IP network POCs for a period of one month following re-designation of its number blocks.

7.69 Based on its proposals, BT would begin to notify other telecoms providers of its migration dates by early 2022 (which we would expect to be January to March 2022).

Potential of distortion to competition due to uncertainty of BT's migration plans

7.70 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, or when to decommission legacy equipment.

7.71 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.

7.72 Our central concern is to avoid any distortion of competition for telecoms providers, which could arise as a result of uncertainty about BT's plans or unexpected changes to those plans.

7.73 An unpredictable or delayed migration by BT could result in telecom 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,

[164] 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 following during its number block migration.

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

7.74 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.

7.75 We raised these concerns in our 2019 First Consultation and several telecoms providers agreed with some of them. For example, Virgin Media said it was important to ensure that a sole operator does not wield undue influence over the market during the migration[165] and TalkTalk said that the absence of transparency over BT's migration to IP would restrict providers' ability to plan for the efficient retirement of legacy equipment.[166]

7.76 Telecoms providers were generally supportive of our suggestion of requiring BT to set out a timetable for when its POCs will move to its IP network and TalkTalk said a 12-month migration timetable, with a three months minimum notification period for any changes to migration dates, would be appropriate.[167]

Obligation on BT to publish its timetable (for when its relevant POCs will migrate to its IP network) by a specific date

7.77 To address our concern that an uncertain timetable may negatively impact competition, we propose an obligation on BT to confirm and publish its timetable for switching its POC (where WCT is made available) to its IP network, by a specific date. In particular, we propose that BT's timetable should reflect the key features it outlined to industry:

a) **12-month notification of proposed migration date** – BT will 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 at the DLE to IP interconnection ('the migration date').

b) **90 days' notice to postpone proposed migration date** – 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.

c) **30 days of simultaneous WCT availability 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 the relevant DLE for that block for a period of 30 days from the migration date.

[165] Virgin Media, 2019. Virgin Media's response to the 2019 First Consultation, page 3
[166] TalkTalk, 2019. TalkTalk's response to the 2019 First Consultation, paragraphs 2.6 and 2.7.
[167] TalkTalk, 2019. TalkTalk's response to the 2019 First Consultation, paragraph 2.11

7.78 We propose that BT should be obliged to publish its timetable of when its relevant POCs will move to its IP network. BT will be obliged to publish its timetable 12 months in advance of when it is to commence the migration of its POC where WCT is made available. Given that BT estimates that it will commence the migration of its relevant POCs to its IP network in early 2023, we propose that BT should be obliged to publish its timetable by 1 June 2022, at the latest. When BT publishes its timetable, we also expect it to provide information on how its number block migration will be administrated, as well as how updates to the timetable would be communicated to relevant parties.

7.79 We propose that prior to publication of its timetable for migrating its POCs to IP interconnection, BT should consult with us 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. We propose that BT must provide details of its timetable no less than two months before it is published. Given that we propose that BT publishes its timetable by 1 June 2022 at the latest, this means BT would need to consult by 1 April 2022 at the latest, although we expect BT to have also consulted with telecoms providers well in advance of that date.

Obligation to publish a timetable for the migration of POCs is to apply only to BT

7.80 Although we consider that the industry should work together to coordinate the movement of number blocks from TDM networks to IP networks, we believe that there should only be an obligation on BT to provide information on its migration timetable.

7.81 As already noted above, given BT's scale, industry wide migration to IP is influenced by how and when BT migrates the POCs (where WCT is made available) from its TDM network to an IP network. In particular, telecoms providers 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.

7.82 Therefore, we propose that it is sufficient that BT be the only telecoms provider that is obliged to provide a timetable for when each of its number blocks are to migrate to its IP network. However, we do expect all other telecoms providers to work together and provide each other with their own timetables of when they will coordinate the movement of number blocks from their TDM networks to their IP networks.

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

7.83 From 1 April 2025, we are proposing to implement a requirement that will mean BT will have 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 a result, where a telecoms provider interconnects at an IP POC, BT will be required to charge the telecoms provider on the basis that this is the designated POC for the number being called, even if migration is not complete and that number still resides on BT's TDM network. We propose to implement

this proposal by means of proposed SMP Condition 1.4 as set out in the Notification at Annex 9.

Rationale for our proposal

7.84 As we explain above, our central concern is to avoid any distortion of competition for telecoms providers, which could arise as a result of uncertainty about BT's plans or unexpected changes to those plans. One of the risks set out above is that providers may retain their TDM assets unnecessarily if there is uncertainty about BT's number block migration plans. 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.

7.85 We therefore propose to require BT to offer WCT for all its number blocks at a POC or POCs on its IP network from 1 April 2025. The effect of this measure will be that WCT (charged at the FTR) will be available for IP interconnected traffic, without the additional charges for media conversion and conveyance, from 1 April 2025. This will prevent BT being able to levy 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.

Rationale for choosing 1 April 2025

7.86 In their responses to our 2019 First Consultation, various telecoms providers expressed concerns about BT's commercial charges for IP-to-TDM conversion and the prospect of these continuing for a lengthy period into the future. Vodafone[168] suggested that from April 2021 BT should be required to bear all of the conveyance and media conversion costs associated with sending calls to customers on its TDM via its IP network. Responses from Sky[169] and UKCTA[170] made a similar suggestion, although they (along with several other respondents) also suggested that alternatively such charges could be made subject to a LRIC-based charge control.

7.87 Given the charges faced by many telecoms providers from BT for IP-to-TDM media conversion, it would be in these telecom providers' interest for BT to be compelled to provide WCT at its IP network for all its geographic numbers immediately. However, a lack of a gradual, managed migration is likely to 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.

7.88 This is because if BT had to provide WCT from an IP POC for all numbers from the 1 April 2021, a lot of telecoms providers would be likely to switch all of their interconnections to BT's IP network ahead of BT's end-user migration. BT would in turn have to convey an

[168] Vodafone, 2019. Vodafone's response to the 2019 First Consultation, pages 2 and 12
[169] Sky, 2019. Sky's response to the 2019 First Consultation, paragraph 2.3.
[170] UKCTA, 2019. UKCTA's response to the 2019 First Consultation, paragraphs 8 and 9.

increased amount of calls between its TDM and IP networks. In order to deal with this increase in calls conveyed to its IP network, we expect BT would have to invest in extra media conversion capacity in the short-term, which would become immediately redundant after BT's migration is complete.

7.89 Furthermore, there is a risk that an upsurge in traffic between BT's IP and TDM networks could cause network congestion, leading to call failures and, in the extreme, to destabilise BT's voice network. In a recent submission, BT has highlighted the risk of a significant impact on overall service due to the potential for network congestion.[171]

7.90 While we consider an obligation on BT to provide WCT from an IP POC by 1 April 2021 would be problematic, we consider those concerns will have dissipated by 1 April 2025.

7.91 First, BT's current plans indicate that its number block migration should be complete by late 2024 (given it should commence in early 2023 and should take 12 to 18 months). This is also broadly line with BT's stated plan to withdraw all WLR and ISDN services by the end of 2025.

7.92 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.

Obligation for charges to be as if migration to IP is complete will only apply to BT

7.93 We propose that the obligation on BT to charge for all geographic calls as if it has completed the migration of the POCs for all its number blocks to its IP network from 1 April 2025, should not apply to other telecoms providers. As no other telecoms provider has comparable scale in WCT to BT, 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.

7.94 Furthermore, we expect that other telecoms providers are unlikely to have the incentive to retain their TDM assets, once BT (the single largest voice network) is operating effectively as a network that is entirely IP-based from April 2025, under our proposed regulations.

Pricing remedies specific to BT

7.95 We propose a charge control on TDM interconnection circuits provided by BT. We propose not to have any charge control for the provision of IP interconnection by BT. However, we propose guidance on the fair and reasonable charges obligation for BT's IP interconnection and associated accommodation services.

[171] 'BT response to OFCOM IP migration Questions' (dated 27 July 2020)

TDM interconnection

Summary of proposals

7.96 We propose to maintain the existing charge control in relation to BT's provision of TDM interconnect circuits at the DLE. Specifically, we propose:

- A cap on the interconnect services basket (ISB)[172] 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%).

Approach in the 2017 NMR

7.97 In the 2017 Narrowband Market Review:

- We imposed a charge control for the ISB on BT's external interconnect circuits using a LRIC+ cost standard.
- 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 also not deny BT the opportunity to recover its efficiently incurred costs of providing TDM interconnect. Therefore, we decided to control BT's TDM interconnect circuit charges at the DLE on the basis of a constant real cap, i.e. CPI+0%.
- Additionally, we implemented a 10% sub-cap on each individual charge in the ISB, as this would provide a safeguard to customers from large price increases (in real terms) and mitigate the risk of gaming the basket control, while providing pricing flexibility to BT.

Approach in the forthcoming period

7.98 Given the risk of excessive charges in relation to the provision of interconnection by BT, as identified above, we propose that a charge control for TDM interconnect circuits provided by BT will be appropriate.

7.99 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 in the case of TDM interconnect circuits.

7.100 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. Also, the topology and scale of BT's TDM network is such that telecoms providers will need to

[172] 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 9 of this Consultation.

purchase more (and different) interconnect circuits from BT as compared to other telecoms providers.[173] 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 in particular inhibit the effectiveness of the SMP remedies for the WCT market.

7.101 A charge control can help ensure that customers and ultimately consumers 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). We propose that a charge control on the provision of TDM interconnect circuits by BT at any DLE would be needed as a safeguard until 1 April 2025. As discussed above, we have proposed that from 1 April 2025, BT must make WCT available at the regulated FTR to other telecoms providers for all of its geographic numbers at IP POCs.

7.102 We propose to retain the TDM charge control at its current level in real terms (i.e. CPI+0%). Our main objective in capping the level of interconnect circuit charges is to prevent an increase in prices and to maintain a stable regulatory environment during the migration from TDM to IP networks. Given the relatively small value of BT's external TDM interconnection revenue, 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

7.103 Since we propose to maintain the existing charge control design, we also propose to keep the existing details, wherever possible, for the new charge control. We propose:

- **Duration**: the charge control for the ISB be implemented at any DLE from 1 April 2021 until 1 April 2025 or one month from when WCT at the regulated FTR for number blocks for which the DLE was the nominated POC, is made available at an IP POC, whichever is earlier.
- **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.[174]
- **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.

[173] Interconnect circuits also support originating traffic at the DLEs. As discussed in Section 4, we expect increasing competition in relation to WCO. However, this migration will take time and some providers will remain dependent on TDM interconnection in the meantime.

[174] We 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 on 7 August 2020]

- **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
  - 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 control,[175] 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 proposed basket charge controls.[176]
  - to require BT to publish non-confidential versions of these compliance spreadsheets on its website consistent with current practice.[177]

IP interconnection

Summary of proposals

7.104 We propose that BT's IP interconnection and associated accommodation services should be subject to a fair and reasonable charges obligation supplemented with guidance as summarised in Figure 7.8.

[175] 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.

[176] These spreadsheets should be accompanied by a statement from an independent third party (e.g. the auditor of the Regulatory Financial Statements) confirming the data in the spreadsheets (e.g. that 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.

[177] This has previously been a requirement under the regulatory financial reporting condition, but we propose to move this requirement to the charge control condition.

Figure 7.8 Proposed guidance on fair and reasonable charges obligation for IP interconnection and accommodation

Service	Proposed guidance to fair and reasonable charges obligation
IPEX service setup charges	Charges deemed to be fair and reasonable if reasonably derived from the cost of provision based on a forward looking long run incremental cost approach allowing for an appropriate mark-up for common costs including an appropriate return on capital employed
IPEX interoperability testing charges	Charges deemed 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
IPEX interconnect port charges for direct access at BT exchanges	Benchmarked to Internal Cablelink Variant 1 charge
IPEX interconnect port charges for direct access at neutral access points and indirect access	Charges deemed 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
Accommodation (Co-location and co-mingling)	Benchmarked to comparable service provided in Wholesale Local Access (WLA) market
Cablelink (external and internal)	Benchmarked to comparable service provided in WLA market
Power/electricity	Benchmarked to comparable service provided in WLA market

Source: Ofcom

Approach in the 2017 NMR

7.105 As discussed above, in the 2017 Narrowband Market Review we decided not to regulate interconnection to BT's fixed voice IP network, including not having any specific pricing remedies.

Approach in the forthcoming period

7.106 During the course of 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 and accommodation services that telecoms providers require in order to obtain WCT.

7.107 With IP interconnection, the scale of this risk 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 much more symmetric than was the case for TDM interconnection. As we have set out in section 4 we also expect that telecoms providers will no longer be reliant on BT for WCO by the end of the review period; which will remove the possibility that BT could exercise market power in WCO through the interconnection charges to providers that are dependent on it for WCO.

7.108 In view of this, rather than imposing detailed charge controls we propose to address the risk of excessive pricing by imposing an obligation for BT to ensure that its charges are fair and reasonable, supplemented by guidance concerning the interpretation of this obligation for each service.[178]

IPEX service set-up and interoperability testing charges

7.109 These non-recurring charges are levied by BT when telecoms providers first establish IP interconnection with BT using the IPEX product.

7.110 We would expect that, in many instances, both parties might incur setup 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.

7.111 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 setup and interoperability testing. If so, we would expect that any charges would be cost based.

7.112 We therefore propose to provide guidance that BT's charges for these services would 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 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.

IPEX interconnect port charges

7.113 Under current arrangements, BT's charges for interconnection capacity are in the form of port rental charges rather than interconnect circuit connection and rental charges.

7.114 When determining our approach to these charges, we considered firstly whether interconnect charges should include any allowance for the interconnect node costs as is

[178] The proposal is implemented by means of proposed 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.

the case with TDM interconnect circuit charges.[179] We have provisionally concluded that this is not necessary in the case of IP interconnect charges as the price cap we are proposing for WCT incorporates the LRIC of all of the network components associated with interconnect nodes (specifically the session border controller and associated aggregation layer).[180]

7.115 Where interconnection is provided at a BT exchange, we consider that the relevant costs (i.e. those not already incorporated into the regulated FTRs) are those relating to the interconnect circuits used to connect telecoms providers equipment to BT's interconnect nodes. These are intra-building fibre circuits which are closely analogous to Openreach's Internal Cablelink Variant 1 product which provides fibre connectivity between telecoms providers equipment in different locations within a BT exchange. In the 2020 WFTMR Consultation, we have proposed that Cablelink charges should be subject to a cost-based charge control (CPI-0%) for the next market review period (2021-2026).[181]

7.116 In view of this, we consider that Internal Cablelink Variant 1 would form a suitable benchmark against which to assess whether BT's charges are fair and reasonable. We therefore propose that BT's charges for IP interconnection port capacity (and interconnect circuits if it should choose to introduce such charges in future) would be presumed to be fair and reasonable if, in aggregate, they do not exceed the relevant charge for Internal Cablelink Variant 1.

7.117 We consider that this control would exert a constraint on BT's ability to price excessively for other methods of interconnection (interconnection at neutral access points and indirect access).

7.118 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 costs associated with these methods of interconnection, we propose that a fair and reasonable charge should be cost based. We therefore propose to provide guidance that BT's charges for such interconnect services would 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 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.

7.119 We would 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 would 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

[179] IBC charges include an allocation of DLE equipment costs.
[180] As 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.
[181] 2020 WFTMR Consultation. Volume 4: Pricing remedies, paragraphs 6.31 to 6.33

size of this activity as a proportion of all activities and services supported by that equipment.

Accommodation, power and Cablelink charges

7.120 Telecoms providers interconnecting with BT at BT exchanges require accommodation (and associated facilities) in those exchanges to house their transmission equipment. The services used are the co-location and co-mingling, power, and Cablelink services provided by Openreach which are common to other wholesale services such as LLU, PIA and leased lines.

7.121 We have recently proposed measures to address the risk of excessive pricing of these services in the Physical Infrastructure, WLA and Leased Lines markets in the WFTMR consultation.[182] We therefore propose to adopt guidance that BT's charges for accommodation, power, and Cablelink would be presumed to be fair and reasonable if they do not exceed BT's charges for the corresponding services provide in the WLA market.

Other issues related to interconnection provided by BT

Commercial services provided by BT

7.122 Several telecoms providers set out concerns in their responses to the 2019 First Consultation about the unregulated commercial services provided by BT.

Concerns regarding BT's IPEX services, as well as the Standard Interconnect Agreement

7.123 Concerns were raised about the terms offered in BT's IPEX reference offer, which are for the services it provides to those that interconnect with its IP network. In particular, telecoms providers compared the terms unfavourably with the terms offered as part of BT's Standard Interconnect Agreement (SIA), which relates to BT's interconnection services for those interconnecting with BT's TDM network.

7.124 The Internet Telephony Services Providers' Association (ITSPA) remarked that many telecoms providers continue to operate using the SIA, as opposed to using BT's IPEX service, because the terms offered by the IPEX reference offer are not regarded as a viable alternative to the SIA. ITSPA, as well as many others, expressed concerns over the charges that BT levied for telecoms providers that interconnected with its IP network to terminate calls on its TDM network or use BT's transit services. Other telecoms providers claimed that BT is selective in regard to which networks that it is willing to offer favourable terms to for its IPEX services.[183]

[182] 2020 WFTMR Consultation, Volume 4, Section 6

[183] In its response to the 2019 First Consultation, Simwood asserted that favourable "IPEX Type B" terms are "currently only available to the select few on economic terms that benefit BT commercially and strategically". Similarly, in Magrathea's response to the 2019 First consultation, it accused BT of being "impossible to negotiate with" and "cherry picking" which networks it would offer IPEX services to.

7.125 UKCTA[184] also remarked that the SIA (as well as its related documents relating to charges) affords BT with too much control. UKTCA complained that the SIA allows BT to "impose its own pricing, while simultaneously rejecting it from others". It stated that it is prepared to resource the drafting of an entirely new contract with BT but commented that "OTA facilitation and Ofcom high-level oversight are also required".

Regulated and unregulated IPEX services

7.126 As stated above, we propose 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 proposing guidance as to how we would be likely to assess whether BT's charges are fair and reasonable. We also propose that BT is 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.

7.127 Our package of measures aims to ensure that the prices paid by telecom providers for WCT at BT's IP network for number blocks (once the POCs have been migrated to IP), and the non-price terms and conditions to access IP interconnection in relation to those number blocks, will be fair and reasonable.[185]

7.128 As a consequence, we expect that BT will have to revise some of the terms, conditions and prices of its IPEX services for regulated services, at the minimum, in relation to the IP interconnection charges.

7.129 However, commercial conveyance services provided by BT that enable the conveyance of calls to geographic numbers that are located on its TDM network, from an interconnection point on its IP network, are currently unregulated. Those services are outside the scope of our review and, subject to confirmation of our proposals, will remain unregulated during this market review period.

7.130 Furthermore, we deregulated BT's provision of transit services in the 2013 Narrowband Market Review.[186] They are outside of the scope of this review and, subject to confirmation of our proposals, will remain unregulated during this market review period.

7.131 As the SIA and the existing reference offer for BT's IPEX services mostly relate to unregulated, commercial services, we consider negotiations to revise the contracts to be a commercial matter between industry participants. In relation to regulated services, as noted above, and subject to the confirmation of our proposals, from 1 April 2021, BT will

[184] In its response to the 2019 First Consultation, the UK Competitive Telecommunications Association (UKTCA) describes itself as a "trade association promoting the interest of fixed-line telecommunication companies competing against BT". UKCTA, 2019. UKTCA's response to the 2019 First Consultation.
[185] Our enforcement guidelines set out the factors that we take into account when considering enforcement. Ofcom, 2017. Enforcement guidelines for regulatory investigations.
[186] Ofcom, 2013. *Review of the fixed narrowband services markets: Statement on the proposed markets, market power determinations and remedies*, Section 7

have to ensure that it provides fair and reasonable terms, conditions and charges when revising its contract for IP interconnection.

The End-to-End Connectivity Condition

7.132 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'.

7.133 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.[187] Several respondents to the 2019 First Consultation raised concerns about removing the End-to-End Connectivity Condition, typically remarking that GCA1 was insufficient to ensure telecoms providers can obtain interconnection and ensure end-to-end-connectivity.

7.134 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 the current 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.

Providers other than BT

7.135 In theory, other telecoms providers 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.

7.136 Therefore, we propose 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.[188]

[187] 2019 First Consultation, Section 5.

[188] 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.

Other issues relating to all providers

Designation of multiple POCs for IP networks

7.137 Telecoms providers must make available, on request, sufficient information to allow other telecoms providers to connect at a POC where they will only have to pay the regulated FTR. As discussed above, IP networks typically have a small number of POCs located at core network nodes which are remote from most end-users' fixed lines. Moreover, as conveyance costs are generally not considered to be strongly distance dependent in IP networks, in practice some telecoms providers designate multiple POCs for WCT (at which the FTR is made available).

7.138 In the 2019 First Consultation, we asked whether telecoms providers should maintain the discretion to designate a single POC at which the FTR applies. Most consultation respondents agreed that telecoms providers should maintain this discretion, while noting that in practice most telecoms providers make WCT available (at the regulated FTR) at multiple POCs.

7.139 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.[189]

7.140 On balance, we consider that it remains appropriate that telecoms providers should maintain their discretion to designate a single POC at which the regulated FTR is charged.

Hosted services

7.141 The network access requirement for WCT means that telecoms providers must make available, on request, at least one POC where they will only have to pay the regulated FTR.

7.142 FTRs can be combined with charges for unregulated services, such as transit and conveyance. We understand that some fixed telecoms providers may reach a commercial agreement to combine these charges.

7.143 In the 2017 Narrowband Market Review we explained that we would expect the network access condition to be interpreted as requiring a hosted telecoms provider to ensure its numbers can be reached via at least one POC at the regulated rate because it is the number range holder which exercises control over the provision of the termination service, and ultimately over the price of WCT. Where telecoms providers have chosen to use a hosting telecoms provider, in accordance with the network access obligation, they must ensure that the regulated rate is charged for termination at a relevant POC to that hosting network.

7.144 During the course of this review, concerns have been raised with us that some telecoms providers who are using hosting services have not ensured that the regulated rate is available at a relevant POC on the hosting network, and relatedly that some such telecoms

[189] Responses to the Question 4.4 of the 2019 First Consultation can be found on the Ofcom website.

providers do not respond to requests to open negotiations about interconnection for WCT. There was a question raised about the obligation of the hosting party to ensure that hosted providers can make the FTR available at a POC. We would welcome submissions from telecoms providers about the incidence of such problems, their materiality and what further measures we could take to ensure compliance.

Consultation questions

Question 7.1: Do you agree with our proposed non-pricing remedies specific to BT? Please set out your reasons and supporting evidence for your response.

Question 7.2: Do you agree with our proposals relating to BT providing transparency on its migration timetable? Please set out your reasons and supporting evidence for your response.

Question 7.3: Do you agree with our proposal to require BT to provide WCT for all geographic calls as if its migration to IP is complete, from 1 April 2025? Please set out your reasons and supporting evidence for your response.

Question 7.4: Do you agree with our proposal to subject BT's provision of TDM interconnection circuits to a charge control which expires on 1 April 2025? Please set out your reasons and supporting evidence for your response.

Question 7.5: Do you agree with our proposal to require BT to provide IP interconnection on fair and reasonable terms, conditions and charges supplemented by guidance? Please set out your reasons and supporting evidence for your response.

Question 7.6: Do you have any concerns regarding the existing obligations, which do not require a hosting party to ensure that hosted providers can make WCT available at an accessible POC? Please set out your reasons and supporting evidence for your response.

8. Regulatory Financial Reporting for WCT and interconnection

8.1 This section outlines our main proposals for the regulatory financial reporting requirements to be imposed on BT in relation to the WCT market and associated interconnection.

8.2 Our main proposals include:

- Remove reporting requirements on WCO following our proposed deregulation of WCO;
- Remove the requirement on BT to publish market level information on WCT and Interconnection;
- Maintain 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
- Cost information for interconnection can be prepared separately from BT's cost allocation system.

Introduction

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 attributes[190]:

- **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 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.

8.8 In this section we propose regulatory reporting requirements on BT in relation to the WCT market and associated interconnection. In line with the proposed deregulation of WCO, BT would no longer have reporting requirements in this market.

WFTMR reporting consultation

8.9 In our February consultation 'Promoting competition and investment in fibre networks – BT Regulatory Financial Reporting' (February 2020 Reporting Consultation)[191] we proposed changes to the reporting obligations which currently apply to BT in fixed telecoms markets[192] to ensure the information BT is required to provide in the next market review period continues to meet the reporting attributes set out above.

8.10 We proposed an SMP Condition imposing on BT general requirements for accounting separation and cost accounting.[193] 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.

8.11 This SMP condition also serves as a basis for imposing directions on BT that set out detailed regulatory financial reporting requirements. The directions we proposed in the February 2020 Reporting Consultation are:

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[190] See for example our July 2019 Regulatory Financial Reporting (RFR) Statement.
[191] Ofcom, 2020. *Promoting competition and investment in fibre networks - BT regulatory financial reporting* (February 2020 Reporting Consultation)
[192] The relevant markets are physical infrastructure, wholesale local access (WLA), leased line access and inter-exchange connectivity, which are the subject of our market review proposals in our consultation, the 2020 WFTMR Consultation, which was published on 8 January 2020.
[193] These include requirements to publish a Change Control Notification and Reconciliation Report and for the RFS to be audited.

a) Regulatory Accounting Principles Direction;

b) Preparation, Delivery, Publication, Form and Content Direction;

c) Consistency with Regulatory Decisions and Regulatory Asset Value Direction;

d) Audit of the RFS Direction;

e) Reconciliation Report Direction; and

f) Network Components Direction.

8.12 To ensure the overall coherence of the RFS, the proposals we are making in this consultation are aligned with the proposed SMP condition and directions in the February 2020 Reporting Consultation.

8.13 In particular, we are proposing that 5 of the 6 directions proposed in the February 2020 Reporting Consultation should apply in respect of WCT and interconnection to the extent they are relevant.[194] We do not repeat the text of these directions in this consultation since we are not proposing any amendments. We are proposing some amendments to one direction to capture our proposals in relation to WCT and interconnection, as set out below.

8.14 We currently plan to consolidate next year our decisions on BT's regulatory reporting obligations, as they apply to the WFTMR markets and WCT and interconnection.

Reporting for WCT and interconnection

8.15 We currently require BT to publish information relating to the preparation of the RFS, the financial performance of regulated markets and assurance over the RFS. We also require BT to provide us with information privately. We discuss each of these requirements below in relation to WCT and interconnection, set out our proposals, and explain how these will be implemented.

8.16 We propose to reduce generally the reporting requirements in relation to WCT and TDM interconnection and to introduce some reporting for IP interconnection to recognise the following:

- **Market size**: the revenues that BT currently reports for WCT and TDM interconnection are very small compared to other reported SMP markets. For example, in 2019/20 BT's total revenue for WCT and TDM interconnection (at the DLE) was £13m, 0.2% of its total SMP revenues.[195]
- **Transition period**: as explained in section 7, termination and interconnection traffic is expected to migrate from BT's TDM network to its IP network during this review period

[194] 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), under our proposals 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 - see paragraphs 7.37 to 7.39 and 7.46 to 7.49 of the February 2020 Reporting Consultation).

[195] BT's 2019/20 Regulatory Financial Statements.

and our remedies aim to support this transition. We have 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.[196] WCT and interconnection is generally provided by a different part of BT, separate from Openreach. Following the proposed deregulation of WCO, WCT (including the interconnection services which are associated with it) will be the only SMP market outside of Openreach with reporting obligations and so we have considered whether some information, in particular cost information (where required), could be provided in a less onerous way.

8.17 As noted above, our proposed reporting remedies are aligned with our proposals in the February 2020 Reporting Consultation. We will take account of consultation responses with a view to ensuring that that the SMP Condition and directions for reporting that we impose on BT in all the relevant markets are consistent.

8.18 The rest of this section is structured as follows:

- Regulatory reporting remedies for WCT and interconnection; and
- Reporting requirements for WCT and interconnection.

Regulatory Reporting remedies for WCT and interconnection

Regulatory framework

8.19 Sections 87(7) and 87(8) of the Act allow us to impose accounting separation conditions on a dominant provider relating to network access to the relevant networks or the availability of relevant facilities, including requirements about the accounting methods to be used in maintaining the separation.

8.20 Section 87(6)(b) of the Act authorises us to set SMP conditions which require a dominant provider to publish, in such manner as we may direct, such information as we may direct, for the purpose of securing transparency in relation to matters connected with network access to the relevant network or with the availability of the relevant facilities. Article 9(1) of the Access Directive specifies that such information can include accounting information.

8.21 Section 87(9)(c) authorises us to set conditions imposing on the dominant provider such rules as we may make about the use of cost accounting systems for the purposes of charge controls in relation to matters connected with the provision of network access to the relevant network, or with the availability of the relevant facilities; and such rules as we may make in relation to those matters about the recovery of costs and cost orientation.

8.22 Under section 87(10) this can include conditions requiring the application of presumptions in the fixing and determination of costs for the purposes of the charge controls, recovery of

[196] BT's 2019/20 regulatory financial statements indicate that 96% of SMP market returns sit in Openreach.

costs and cost orientation rules, and the cost accounting system. Where such conditions are imposed, section 87(11) imposes a duty on us to set an SMP condition which requires the dominant provider to publish a description of the cost accounting system and to include in that description details of:

- the main categories under which costs are accounted for; and
- the rules applied for the purposes of that system with respect to the allocation of costs.

8.23 We must also take due account of relevant recommendations, although in light of particular factors it may be appropriate to depart from them. We consider the 2005 EC Recommendation on accounting separation and cost accounting systems to be particularly relevant.[197]

8.24 We also consider the 2013 EC Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment.[198]

Accounting separation

8.25 We propose 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 proposed and, in particular, to monitor BT's activities with regard to its no undue discrimination obligations.[199]

8.26 As we propose that BT would be 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.

8.27 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,

[197] 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')
[198] 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)
[199] 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 propose to apply no undue discrimination obligations on BT in WCT, interconnection and associated accommodation services.

and is the least onerous obligation necessary to ensure a mechanism exists to allow us and stakeholders to monitor potentially discriminatory behaviour by BT.

8.28 We consider that our proposal to impose an accounting separation obligation, together with a cost accounting obligation (see below), in respect of BT's provision of WCT and associated interconnection services will help ensure these regulatory reporting objectives are met.

Cost accounting

8.29 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 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.[200]

8.30 We propose 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

[200] 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."

- absent such a requirement, 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, or that if price regulation continued to be required in the next regulatory period, the necessary information would be available for Ofcom to implement it.

Implementation

8.31 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 are proposing to impose on BT for WCT and associated interconnection services is set out in Annex 9 while the legal tests are set out in Annex 8.

8.32 Under this SMP condition we may from time to time make such directions as we consider appropriate in relation to BT's reporting obligations.

8.33 To give effect to our proposals we also intend that three directions proposed in the February 2020 Reporting Consultation under section 49 of the Act will also apply in respect of the 'Regulatory Financial Reporting' SMP condition we are proposing in relation to WCT and associated interconnection services. These directions are:

a) Regulatory Accounting Principles Direction;

b) Audit of the RFS Direction; and

c) Reconciliation Report Direction.

8.34 These directions are set out in Annex 5 to the February 2020 Reporting Consultation.

8.35 We intend to give the following direction under Section 49 of the Act and the 'Regulatory Financial Reporting' SMP Condition we are proposing in relation to WCT and interconnection:

a) Preparation, Delivery, Publication, Form and Content Direction ('Form and Content direction').

8.36 This direction is in line with a direction proposed in the February 2020 Reporting Consultation with amendments to reflect our reporting proposals 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 system[201] (as set out below), under our proposals it will be required to do so in accordance with the Consistency with Regulatory Decisions and Regulatory Asset Value direction or the Network Components Direction.[202]

[201] i.e. using CostPerform, BT's present cost allocation system.
[202] February 2020 Reporting Consultation, paragraphs 7.37 to 7.39 and 7.46 to 7.49

8.37 The directions we are proposing to impose on BT in relation to WCT and associated interconnection services are is set out in Annex 9 while the legal tests are set out in Annex 8.

WCT and interconnection reporting requirements

Published information

Introduction

8.38 In the 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.[203] In the February 2020 Reporting Consultation, we proposed some changes to the way information is presented in these three schedules.[204]
- **Service level information**. This can include the revenue, volume, price and costs of specific services or groups of services associated with SMP markets.
- **Breakdown of service level costs**. Currently a split of service level fully allocated costs (FAC) is provided by cost component alongside a schedule showing how unit cost components are calculated.[205] In the February 2020 Reporting Consultation we proposed to replace this with a breakdown of operating costs and MCE.[206]

8.39 BT is currently required to publish market level information for WCT and TDM interconnection. It is also required to publish service level revenue, price and volume information for WCT and TDM Interconnection. Service level costs (and a breakdown of those costs by component) are published for TDM Interconnection but not for WCT.

8.40 In the February 2020 Reporting Consultation, we 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.

8.41 In section 6 we explain we are minded to impose a no undue discrimination obligation on BT in relation to the WCT market, and we propose a price cap on termination, with the price cap set at LRIC based on a bottom up model adjusted for inflation. As set out in

[203] The performance summary by market, the attribution of wholesale current costs and attribution of wholesale MCE schedules.
[204] February 2020 Reporting Consultation, paragraphs 4.5 to 4.38. The three market performance schedules are i) summary of market performance, ii) attribution of wholesale current cost and iii) attribution of wholesale MCE schedules.
[205] In BT's cost attribution system, costs are ultimately attributed to cost components which in turn are attributed to services.
[206] February 2020 Reporting Consultation, paragraphs 4.52 – 4.53

section 7, a no undue discrimination obligation would also apply to TDM and IP interconnection services.

8.42 In section 7 we proposed 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.

8.43 In section 7 we also proposed fair and reasonable charging obligations on IP interconnection services, supplemented by guidance explaining how we are minded to assess whether those charges are fair and reasonable.

8.44 Outside of Openreach, we recognise that our proposals would mean BT will only have regulatory reporting obligations on WCT and interconnection during this control period, both of which are very small in comparison to Openreach SMP markets. We have taken this into account when making our proposals below.

8.45 In general, we consider 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.[207]

WCT

8.46 We propose that BT must continue to publish information on revenues, prices and volumes for a single WCT Service, split between internal and external customers. We propose that the following schedule would be published, which is the same as that appearing in the 2019/20 RFS.

Table 8.1: Proposed 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							

8.47 Requiring BT to publish internal and external prices will help demonstrate BT's compliance with the no undue discrimination obligation and would allow stakeholders to see how average prices during the year compare to the price cap. Publishing internal and external revenues and volumes would help demonstrate the impact of the remedy proposed for WCT and provide transparency about the relative usage of WCT by BT and external telecoms providers.

8.48 We expect BT to explain how it has derived call termination volumes in its Accounting Methodology Document (AMD), including any assumptions it has made.[208]

[207] February 2020 Reporting Consultation, paragraphs 4.56 to 4.60.
[208] Any changes to the methodology should be put through the annual Change Control Notification process.

8.49 We do not propose to require BT to publish cost or return information on WCT. In practice this means that WCT would no longer appear in the three market level schedules. As the price cap is set by reference to LRIC using a bottom up model, we do not consider that returns based on fully allocated costs (FAC) would provide meaningful information to stakeholders.[209] Further, since the model does not rely on cost information from BT 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 small[210], we do not consider it would be proportionate to require BT to prepare and publish cost information relating to WCT during this control period.

TDM interconnection at the DLE

8.50 We propose that BT must continue to publish information on external revenues, prices and volumes while the charge control is in place for TDM interconnection services at the DLE. We propose that the following schedule would be published, showing each service in the TDM interconnection basket. Only services in the basket which connect at the DLE need to be published and we propose that BT includes a note in the RFS where any service is omitted as it does not connect at the DLE.[211] This is consistent with the current schedule reported in the RFS.[212] We propose that BT must publish this information to the extent it relates to the period that the charge control is in place for TDM interconnection. This is consistent with our proposal in section 7 that BT will be required to provide WCT for all of its geographic numbers at an IP POC from 1 April 2025.

[209] In the last two years for example, WCT returns have been -54% and -51% (from the 2018/19 RFS). When WCO was also reported, these negative returns for WCT could be contrasted against the higher returns for WCO (34% and 37% 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 proposed deregulation of WCO, this will no longer be the case during this review period.
[210] 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.
[211] In the current RFS for example, CSI and ISI links are not published as they do not connect at the DLE.
[212] BT currently includes columns for internal revenues, volumes and prices, but the control only relates to interconnection services purchased by external customers, so we have removed 'internal' columns.

Table 8.2: Proposed TDM interconnection service schedule

Detailed service analysis	External revenue	External volume	Measure	External average price
	£m			£
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				

**Some of these services will not be published to the extent they do not connect at the DLE.*

8.51 Reported revenues should be gross of any revenue shares of discounts associated with the traffic passed over the circuits.[213]

8.52 Requiring BT to report price information would 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 propose to apply to interconnect circuits. Combined with IP interconnection reporting (see below) our proposals will also help show trends in TDM and IP interconnection usage while publishing revenues will allow stakeholders to see the revenues that are used as the weighting in the proposed charge control formula.

8.53 As with WCT, we expect BT to explain how it has derived TDM interconnection volumes at the DLE in its Accounting Methodology Document (AMD), including any assumptions it has made (for example to identity TDM interconnection at the DLE versus TDM interconnection at the tandem layer).

8.54 We do not propose to require BT to publish cost or return information on TDM interconnection.[214] In practice this means that TDM interconnection would no longer appear in the three market level schedules and service level costs for each reported TDM interconnection service would no longer be published. As explained in section 7, the objective of the CPI-0% basket control on TDM interconnection is to prevent an increase in prices in real terms and maintain a stable regulatory environment during the transition to IP interconnection. Given this objective, we do not consider that cost information is required for stakeholders to assess the effectiveness of the proposed remedy. Consequently, and given the costs of TDM interconnection at the DLE are very small (and

[213] This is consistent with the definition of external revenue in the TDM charge control condition.
[214] We propose to require BT to provide us cost information on TDM and IP interconnection services later in this section.

likely to reduce further as migration to IP occurs)[215], we do not consider it would be proportionate to require BT to publish cost information relating to TDM interconnection during this control period.

IP interconnection

8.55 In section 7 we proposed that BT's charges for IP interconnection and associated accommodation services would be subject to fair and reasonable charging obligations and we proposed guidance on how we would assess compliance with this obligation for some services. We propose 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 (NAP);
- IP Exchange interconnect port charges for indirect access; and
- Other IP interconnection services[216] (if applicable).

8.56 We propose that the following schedule would be published, which is similar to the format of the TDM interconnection schedule. We propose that BT must publish this information from the start of the review period, noting that the volumes and revenues reported in this schedule will increase over time.

Table 8.3: Proposed IP interconnection service schedule

Detailed service analysis	External revenue £m	External volume	Measure	External average price
IP Exchange service establishment charges				
IP Exchange Interoperability testing charges				
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				

8.57 Requiring BT to report price information would allow stakeholders to see how average prices compare to the proposed benchmark prices (for 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 helps demonstrate the impact of the regulation we propose to apply to interconnect circuits. Combined with TDM interconnection reporting our proposals will also help show trends in TDM and IP interconnection usage.

[215] In the 2018/19 RFS BT reported operating costs of £4m and MCE of £6m for TDM interconnection at the DLE.
[216] This would exclude charges associated with accommodation, power and Cablelink required to interconnect at BT exchanges per our proposal below to report these within a 'Shared Ancillaries' schedule.

8.58 We expect BT to explain how it has derived IP interconnection volumes for these services in its AMD, including any assumptions it has made (for example to identity port charges required to terminate voice calls from those used for other purposes).

8.59 For service establishment charges, interoperability testing charges and IP Exchange port charges for direct access at neutral access points (NAP) and indirect access, we propose 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. This will help assess BT's compliance with the proposed fair and reasonable charging obligation set out in section 7, given the guidance we have proposed.

8.60 We expect the costs associated with these IP interconnection services to be small compared to other regulated parts of BT. Given these would be the only costs we would require 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 wished[217]). Instead, we propose that BT could estimate these costs outside of its cost accounting system.[218] BT would need to explain how it has estimated these costs in its AMD, including any assumptions made, and 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.

8.61 Other than the note on costs for certain services set out above, we do not propose to require BT to publish cost or return information on IP interconnection. This means that IP interconnection will not appear in the three market level schedules. As we propose that 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 interconnection generally, we do not consider it would be proportionate to require BT to publish cost information relating to all IP interconnection during this control period. This is consistent with our proposed approach to TDM interconnection.

8.62 In section 7 we proposed to benchmark charges for accommodation, power and Cablelink to the comparable service provided in the WLA market and consulted on in the WFTMR Consultation. In the February 2020 Reporting Consultation we proposed that these services, which are used across all the WFTMR markets, would be reported in a 'Shared Ancillaries' Schedule in the RFS.[219] We consider it is appropriate and proportionate to require BT to report these shared ancillaries in aggregate, rather than for each SMP market. This is for two reasons. First, the proposed price of these ancillaries in the 2020 WFTMR Consultation is the same across all the proposed SMP markets in that document. Second, we have proposed in this Consultation that where these services are required for IP Interconnection they should be benchmarked to price in those WFTMR markets.

[217] Where BT chooses to prepare these costs using its cost accounting system, we propose that it must do so in accordance with the Consistency with Regulatory Decisions and Regulatory Asset Value Direction and the Network Components Direction proposed in the February 2020 Reporting Consultation. This will ensure the overall coherence of costs prepared using BT's cost accounting system across different SMP markets.
[218] 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.
[219] Paragraphs 4.61 to 4.63, February 2020 Reporting Consultation.

Therefore, we propose that the accommodation, power and Cablelink services reported in this Shared Ancillaries Schedule should also include any services required for IP Interconnection.

Amendments to market level schedules

8.63 We propose a small amendment to the three market level schedules consulted on in the February 2020 Reporting Consultation to reflect our proposals above that WCT, TDM interconnection and IP interconnection would not appear in these schedules. This amendment would see 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 WCT, TDM interconnection and IP interconnection included in the Rest of BT column.

Implementation

8.64 The proposed schedules for WCT and associated interconnection are included in the 'Form and Content' direction in Annex 9. The legal tests for the Form and Content direction are set out in Annex 8.

Private information

8.65 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.

8.66 Some of the information BT provides relates to all markets in the RFS, for example data and models supporting BT's regulatory accounting system. In the February 2020 Reporting Consultation, we proposed private reporting requirements in relation to all markets[220] and we propose to impose these same requirements on WCT and associated interconnection to ensure a consistent set of requirements across all markets.

8.67 We also propose to require BT to provide us with additional financial information (AFI) schedules specific to interconnection. These proposals are set out below. We are not proposing any AFIs specific to WCT.

Interconnection

8.68 We propose to require BT to provide us with cost information on TDM interconnection 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 we have proposed that costs for some IP interconnection services will be published, having private information on all published IP interconnection services will help us understand how those costs have been estimated.

[220] February 2020 Reporting Consultation, paragraphs 6.15 to 6.17

8.69 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).[221]

8.70 Instead, we propose that BT could provide the operational and capital costs directly associated with providing 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. This will likely require BT to allocate some costs where they are shared with other services. We propose to specify the type of cost information BT should provide on TDM and IP interconnection but expect to work with BT over the course of the period on the format and detail of the information provided.[222]

8.71 For service establishment charges, interoperability testing charges and IP Exchange port charges for direct access at neutral access points (NAP) and indirect access we propose to require that BT provides us with the full details and calculations supporting the costs we propose it publishes in a note to the RFS (see above).

8.72 BT will be required to provide us with cost information on TDM interconnection and IP interconnection from the start of the control period.

Implementation

8.73 The proposed requirements for private information related to interconnection are included in the 'Form and Content' direction in Annex 9.

Preparation and assurance

Preparation of the RFS

8.74 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.

[221] Where BT chooses to prepare these costs using its cost accounting system, we propose that it must do so in accordance with the Consistency with Regulatory Decisions and Regulatory Asset Value Direction and the Network Components Direction proposed in the February 2020 Reporting Consultation. This will ensure the overall coherence of costs prepared using BT's cost accounting system across different SMP markets.
[222] Where BT estimates cost for interconnection outside of its cost allocation system, we propose it will need to demonstrate to us that the costs are not also included in other SMP markets.

8.75 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.[223]

8.76 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. This included proposals in relation to the Accounting Methodology Documents (AMD), Wholesale Catalogue, Change Control Notification, Reconciliation Report, attribution schedules and cost components.[224] We also proposed some preparation requirements applicable to all SMP markets, for example the Regulatory Accounting Principles (RAP).[225] To ensure the same requirements are imposed on all SMP markets where BT has SMP obligations we propose to adopt the same requirements in this consultation.[226] We do not propose to make any preparation requirements specific to WCT or Interconnection.[227]

8.77 Publication requirements associated with the preparation of the RFS are included in the SMP Condition, in conjunction with the RAP direction proposed in the February 2020 Reporting Consultation.

Assurance

8.78 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.

8.79 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. We propose the same requirements in this consultation. We think it is important that the audit requirements are similar across markets so the regulatory auditor can provide an overall opinion on the published RFS. We will therefore aim to ensure that the assurance requirements in the voice and WFTMR statements are the consistent.

8.80 The proposed requirement to audit the RFS is set out in the proposed SMP condition, in conjunction with the Audit Direction proposed in the February 2020 Reporting

[223] 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.
[224] February 2020 Reporting Consultation, paragraphs 5.7 to 5.52.
[225] February 2020 Reporting Consultation, paragraphs 5.53 to 5.96.
[226] We note that some schedules, such as the proposed attribution schedules, would not include WCT or interconnection as we propose in this consultation not to require cost information to be published at a market level.
[227] As noted above, where BT chooses to estimate costs for TDM and IP interconnection services using its cost accounting system, under our proposals 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 - see paragraphs 7.37 to 7.39 and 7.46 to 7.49 of the February 2020 Reporting Consultation).

Consultation. The proposal to require BT to commission work from independent third parties when required by us is set out in the proposed SMP condition in the same annex.

Consultation question

Question 8.1: Do you agree with our proposed regulatory reporting requirements on BT? Please set out your reasons and supporting evidence for your response.

9. WCT: technical standards for IP interconnection

9.1 This section considers the status of the technical standards for IP interconnection, the potential risks that might arise and whether any further action is required to address those risks. We propose to incentivise the use of common technical standards by proposing guidance on the interpretation of the network access obligation.

Background

9.2 As previously noted, the transition from TDM to IP networks will be accompanied by a shift from TDM to IP interconnection. This means that the transport and signalling protocols will be different.[228] Whereas TDM interconnection is by means of TDM transport technologies and SS7 signalling, IP interconnection uses Ethernet transport technologies and SIP signalling.

9.3 Although both the transport and signalling protocols are defined in international standards, they 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'.

9.4 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.[229] 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.

9.5 Since the 2017 Narrowband Market Review, NICC has published several new IP interconnection standards largely completing its work on IP interconnection standards.[230]

9.6 In the 2019 First Consultation we noted that some stakeholders have raised concerns that a lack of adherence to the NICC standards could pose a risk to the integrity of voice

[228] The messages used within and between networks to control call setup and tear-down.
[229] 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.
[230] These publications include: ND1037 SIP NNI Interworking (IP to TDM interworking) and ND1653 on SIP overload control.

services, particularly during the transition to IP networks. We noted that there have 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). It is important that these configuration options are standardised to 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 is needed to ensure 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.

9.7 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).

9.8 We therefore sought stakeholders' views about the likelihood of these problems arising in practice and whether any additional measures might be required to mitigate them.

Our assessment and proposals

Responses to the 2019 First Consultation

9.9 Respondents to the 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.

9.10 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.

9.11 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.

9.12 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.

9.13 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 assessment

9.14 The telephone system is a central element of the UK's critical national infrastructure, so it is essential that it continues to operate with the utmost reliability during and after the transition to IP networks. Telecoms providers have regulatory obligations to secure this outcome, including their obligation under General Condition A3 to secure the fullest availability of publicly available telephone services and uninterrupted access to the emergency services.

9.15 Having considered the responses, our initial view is that the risks associated with this variability should be manageable by industry for several reasons.

9.16 Telecoms providers have a strong incentive to adopt the NICC standards for IP interconnection given existing regulatory obligations under General Condition A3 and demand from people and businesses to provide high quality telephone services. The NICC IP interconnection standards have been developed by the expert industry body and are designed to offer the greatest assurance that IP voice interconnection will work reliably. They should also reduce costs by avoiding the need for bespoke interconnection arrangements.

9.17 We also note that the NICC IP interconnection standards are supported by large telecoms providers such as BT and Vodafone who have participated in their development. They would therefore be likely to specify the NICC IP interconnection standards for interconnection and to have the necessary engineering resources to develop effective

interworking profiles[231] to interconnect with telecoms providers who do not support them. As most small telecoms providers use a large telecoms provider as their primary, often sole, interconnection partner this should largely mitigate the risks discussed above.

9.18 More generally, we would expect that over time, the NICC IP interconnection standards will be supported by an increasing number of equipment vendors and also specified by an increasing number of telecoms providers for their WCT and transit services.

Proposed guidance concerning technical standards

9.19 We note 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. This we are happy to do. 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.

9.20 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.

9.21 We consider that a more proportionate approach would be to adopt guidance concerning our interpretation of the network access obligations we are proposing for all telecoms providers which we have provisionally found to have SMP in WCT. In particular, we propose to adopt guidance, as set out below, 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.

Proposed 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

[231] Such profiles might include media gateway configurations to translate codecs and/or SIP scripts to covert signalling messages.

associated with the use of that interface, such as media conversion or protocol conversion costs.

9.22 This guidance would not preclude telecoms providers from reaching commercial agreements concerning the technical interfaces to be used for IP interconnection or the recovery of costs.

Consultation questions

Question 9.1: Do you agree with our initial view that the risks associated with IP interconnection should be manageable by industry?

Question 9.2: Do you agree with our proposed guidance concerning IP interconnection? Please set out your reasons and supporting evidence for your response.

10. Review of termination on the 070 number range

10.1 In this section, we set out our proposals for the future regulation of termination services on the 070 number range. Our proposals follow our decision in October 2018 to introduce a charge control for 070 termination rates set at the same rate as the charge control on termination rates for calls to mobile numbers (the 2018 070 Market Review Statement).

10.2 We provisionally define the relevant market as the wholesale termination services that are provided by a 070 number range holder to another communications provider for terminating calls to the 070 numbers within the range it holds. We provisionally conclude that each 070 provider has SMP within the relevant market.

10.3 We propose to continue to impose a charge control on 070 termination rates, set at the same rate as the MTR. This is to address the risk of excessive prices and therefore address the competition concerns and consumer harm associated with calling 070 numbers. High prices and misuse of the 070 number range was common prior to the introduction of the charge control in our 2018 070 Market Review Statement. The relevant charge control proposals are set out in Table 10.1 below.

Table 10.1: Proposed 070 termination charges

	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		0.389	0.379	0.384	0.390	0.394
Range		0.257 - 0.485	0.257 - 0.466	0.274 - 0.464	0.294 - 0.462	0.313 - 0.460

Source: 2020 MCT Model

Background

10.4 The 070 number range was introduced to be used for personal or 'follow-me' numbers, which allow consumers or businesses to offer a single contact number which they can route to a fixed or mobile number. They were established before the availability of mobile roaming, to offer a single number which could be used while travelling in the UK and abroad.

10.5 When someone calls a 070 number, the caller's communications provider pays a termination charge to the 070 service provider for the call to reach the recipient. The caller is then charged a retail price by their communications provider for making that call.

10.6 As part of Ofcom's Call Cost Review, announced in May 2017, we conducted a review of the 070 numbers range looking at the cost of calling 070 numbers and the frequent misuse of these numbers. We found that wholesale termination rates on 070 numbers were high and these harmed consumers as they led to high retail prices. We found that customers were unable to distinguish 070 numbers from mobile number calls (which begin with '07x' and were much cheaper to call) and 070 numbers were not included in call bundles, so customers experienced 'bill shock' as a result of the high retail charges for these calls. In addition, we said that high wholesale termination rates provided incentives for the fraudulent misuse of 070 numbers. We said that this contributed to the 070 number range gaining a poor reputation.[232]

10.7 We found that communications providers who held 070 numbers had SMP in the provision of wholesale call termination on the number range and we implemented a remedy to address the harms we had identified. We imposed a cap set at the same level as the respective cap for mobile termination rates. We did this to align with customers' expectation that the cost of calling a 070 number is the same as the cost of calling a mobile number.

10.8 The charge control came into effect on 1 October 2019 and will lapse on 31 March 2021. We have reviewed the 070 termination market again, considered whether a price cap is needed for the 2021 to 2026 review period and if so, the appropriate level of that price cap.

Market Definition and SMP Assessment

Summary of findings on market definition and SMP in 2018 070 review

Market definition

10.9 In 2018, we defined 127 separate markets for the termination of voice calls to 070 numbers. We concluded that each relevant market was "wholesale termination services that are provided by [named terminating communications provider] (TCP) to another communications provider, for the termination of voice calls to 070 numbers within the range which has been allocated to that TCP by Ofcom, for which that TCP is able to set the termination rate".[233]

10.10 In reaching this market definition, we took the provision of WCT for voice calls to an individual 070 number as our focal product and then considered the scope for substitution at the retail and wholesale level.

[232] Ofcom, 2018. *Personal Numbering – Review of the 070 number range: Final Statement* (2018 070 Market Review Statement)
[233] 2018 070 Market Review Statement, paragraph 3.65

10.11 In terms of retail market substitution, we found that there was a very low consumer awareness of 070 numbers and the retail prices for calling them, making retail substitution unlikely.

10.12 At the wholesale level we concluded that:[234]

- There were no opportunities for demand side substitution because once a caller chooses to call a 070 number, the caller's provider has no alternative but to purchase termination from the provider of the 070 number that is being called.[235]
- Supply side substitution was not an effective constraint because the only telecoms operator that can supply termination to a given 070 number is the 070 provider to which that number has been allocated.[236]

10.13 We said that the absence of demand-side and supply-side substitutability allowed a separate market to be defined for the provision of WCT to each 070 number. We aggregated these markets by terminating provider on the basis they faced similar competitive conditions.[237]

10.14 We determined the relevant geographic market by reference to the area in which 070 providers can determine 070 WCT rates for the UK 070 numbers allocated to them. We said that the number of operators in a particular geographic area does not affect the competitive conditions a provider faces in providing 070 termination services since voice termination provided by one provider is not a substitute for termination provided by another.

10.15 We were satisfied that this market was susceptible to regulation because it satisfied the three criteria test:

- **That there was a presence of high and non-transitory barriers to entry** as each 070 provider has a monopoly over the provision of termination on the 070 numbers which they hold.[238]
- **The market did not tend towards effective competition.** Termination rates had remained consistently high over the years although cost of inputs had fallen since end-users have little to no incentive to drive rates down.[239]
- **Competition law alone would not adequately address the market failures**. Because of the high barriers to entry, we considered that competition law would not provide a sufficiently swift and effective remedy to the harms we identified.[240]

[234] 2018 070 Market Review Statement, paragraph 3.51
[235] 2018 070 Market Review Statement, paragraph 3.51 to 3.52
[236] 2018 070 Market Review Statement, paragraph 3.51 to 3.52
[237] 2018 070 Market Review Statement, paragraph 3.53 to 3.45
[238] 2018 070 Market Review Statement, paragraph 3.99
[239] 2018 070 Market Review Statement, paragraph 3.101
[240] 2018 070 Market Review Statement, paragraph 3.104

Market Power assessment

10.16 We concluded that each of the 070 number range holders had SMP in the corresponding relevant market on the basis that:

a) Each provider had high current and future market shares.[241]

b) There were high and non-transitory barriers to entry, as a 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.[242]

c) There was an absence of effective countervailing buyer power (CBP). For CBP to exist, purchasers of termination services should be able to threaten to refuse to purchase termination. However, we found no evidence of CBP in 2018.[243]

d) We found evidence of pricing above competitive levels. We found that the average termination rate for UK originating calls to 070 number was 38.84ppm, which was substantially higher than the incremental cost of providing the service at 1.093ppm.[244]

10.17 We went on to find that there were material levels of consumer harm resulting from the SMP on the 070 range and the high termination rates that resulted. We set a charge control on 070 WCT tied to the level of the cap on the MTR to address this.

Our review of the 070 market and SMP determinations

10.18 We completed our last review of the market for 070 termination in October 2018; the charge control that we set as a result came into effect on 1 October 2019. Given that our last intervention was less than a year ago, we consider it appropriate to draw from the assessment in our last review summarised above, in defining the relevant market and our proposed SMP determinations for the next review period.

10.19 Taking the provision of WCT to each 070 numbers as our focal product, we are not satisfied that there are sufficient substitutes at the retail level to operate as an effective constraint on termination rates in the absence of our cap. In particular, there is no reason to believe that the very low levels of consumer awareness of 070 numbers and of retail prices for these calls has changed to any material degree since our 2018 070 Market Review Statement.[245]

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[241] 2018 070 Market Review Statement, paragraph 3.72
[242] 2018 070 Market Review Statement, paragraph 3.74
[243] 2018 070 Market Review Statement, paragraph 3.81.
[244] We estimated that the incremental cost of providing 070 calls ranged from 1.093ppm for termination to a UK fixed number, to 5.591ppm for termination to an international mobile number. 2018 070 Market Review Statement, paragraph 3.84.
[245] In addition to the data referenced in the 2018 070 Market Review Statement, 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

10.20 As a result of our charge control, 070 termination rates have decreased from an average of 38.84ppm to 0.479ppm and it has been reported that there has been a corresponding reduction of about 90% in call volumes to 070 numbers since Q4 2018.[246] This fall in demand is likely to reflect a substantive reduction in the use of 070 services by call recipients, including users that were exploiting 070 numbers for fraudulent purposes. It is unlikely that customers have become aware of 070 call prices and are substituting between 070 calls and other calls in response to high 070 call prices. If there was no charge control we would expect termination rates to revert to their previous excessive levels.

10.21 At the wholesale level, it remains the case that there is no demand-side or supply-side substitution since the call must be terminated at the number dialled and only the provider holding the 070 number can provide termination services (unless it gives access to another provider, which we do not consider is plausible).

10.22 We also consider that there is no basis for changing our approach to the definition of the relevant geographic market from that adopted in the 2018 070 Market Review Statement.

10.23 Accordingly, in line with our market definition in 2018, we consider that the relevant market is the provision of WCT by a terminating communications provider (TCP) to another communications provider, for the termination of voice calls to 070 numbers within the range which has been allocated to that TCP by Ofcom, for which that TCP is able to set the termination rate.

10.24 We remain of the view that this market satisfies the three criteria test and that the factors listed above in paragraph 10.15 still hold. Termination rates for 070 numbers have fallen as a consequence of our charge control, however we do not regard this as evidence of the market tending to effective competition and would expect termination rates to revert to their previous excessive levels absent a charge control.

10.25 In view of these findings, we propose to determine that each provider holding 070 numbers for which it provides termination services has significant market power with the relevant market.[247] We consider that the factors on which our determinations were based in 2018 remain valid. Specifically:

- The telecoms provider has a monopoly in respect of the provision of WCT on their 070 numbers;
- barriers to entry are high in that other providers cannot provide WCT unless they are given access to 070 numbers by the current holder;
- we consider it unlikely that, in the absence of our cap, countervailing buyer power would emerge to negotiate termination rates down; and

[246] Based on information in relation to call volume data between Q4 2018 and Q4 2019, provided by BT at a meeting with Ofcom on 18 March 2020.

[247] As already outlined in Section 2, we have made less use of our information-gathering powers to obtain relevant information for the purposes of this review and preparation of our consultation proposals than would normally be the case. In particular, for the purposes of identifying providers with SMP in the WCT, MCT and 070 markets, we have referred to numbering information that we already hold. We will be verifying the proposed designations following the publication of our consultation.

- we would expect termination rates to revert to their previous excessive levels absent a charge control.

Remedies

10.26 In view of our proposed SMP determinations, we have considered the *ex ante* regulation that is appropriate and proportionate in the circumstances. In the following paragraphs, we assess the risk of competition and consumer harm arising from the SMP we have identified and then consider the remedies that would be appropriate to address this.

Risk of consumer harm

10.27 In our 2018 070 Market Review Statement, as set out above, we identified a number of negative consequences arising from the high termination charges for calls to 070 numbers. We have considered whether the risk of these harms remains and requires a remedy.

Excessive retail prices for calls to 070 numbers and bill shock for customers

10.28 Prior to our intervention, 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 bundles. 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.

10.29 Figure 10.2 below sets out the retail call prices charged by a number of fixed and mobile providers for calls to 070 numbers in 2018 and in May 2020 (8 months after the price cap came into effect). Figure 10.2 also outlines whether 070 calls are included in call bundles by each provider as of May 2020.

Figure 10.2: Maximum retail call prices for 070 (including VAT) (ppm)

Included in call allowance?		Prices of out of allowance calls					
		Mobile Pay monthly		Mobile PAYG		Fixed	
		2020	2018	2020	2018	2020	2018
O2	Yes	Prices same as standard	55	Prices same as standard	66	-	
Vodafone	No	Prices same as standard	55	45	45	-	
EE	No	5	75	5	75	16	59
Three	No	86	104	86	104	-	
Giffgaff	Yes	-	-	Prices same as standard	50	-	

Included in call allowance?		Prices of out of allowance calls					
		Mobile Pay monthly		Mobile PAYG		Fixed	
		2020	2018	2020	2018	2020	2018
Virgin Media	No	75	75	75	75	51	51
Plusnet Mobile	Yes	Prices same as standard	76	-		-	
Sky	No	55	110	-		50	50
BT	No	-		-		Prices same as standard	48
TalkTalk	No	-		-		Prices same as standard	50

Source: Operator websites [Accessed 27 May 2020]

10.30 This shows that in many cases calls are either included in call allowances or priced the same as out of allowance standard calls. This reduces the risk of that operators' customers experiencing bill shock and paying high retail rates on the basis of not understanding the price of 070 calls.

10.31 These price reductions suggest that the introduction of the cap on 070 termination rates has had some impact in reducing the incentive for operators to charge high retail prices for 070 calls, but that pass through of lower termination charges is uneven. Given the relatively short period of time between the cap on termination rates coming into effect (October 2019) and our consultation, it may be that there will be more pass through in future, either further reductions in retail prices for 070 calls or greater inclusion of such calls in their bundles.

10.32 In the meantime, retail prices charged by some providers for 070 calls remain high relative to retail prices for calling mobile and other numbers, presenting an ongoing risk to customers as a result. Further, if the price cap were to be removed, we consider that termination rates would rise again, leading to an increase in retail prices and potential bill shock for customers.[248]

10.33 More generally, the 90% drop in volumes of 070 charges implies substantial gains to customers who were not aware of the high retail prices they were paying or where the 070 service was being used for fraudulent purposes, as discussed in more detail below.

[248] As noted, the December 2018 study by Futuresight (commissioned by Ofcom) confirms customer confusion existed between certain numbers, including 07 mobile numbers and 070 personal 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

Distorted choices between using 070 and other services

10.34 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.

10.35 There is some evidence that call volumes to 070 numbers have fallen substantially since the introduction of the charge control. 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 contacting them, thereby correcting the distortion in choice between 070 and other services. We consider that to the extent this correction has occurred, it is dependent on the cap remaining in place and keeping 070 termination rates low.

Service provider fraud

10.36 As set out in the 2018 070 Market Review Statement, there has been a high incidence of reported fraud associated with the 070 range[249], which we considered derived from the high termination rates. These increased the risk of scams, whereby customers are tricked into calling a 070 number in order to enable fraudsters to generate revenues from termination, and other fraudulent uses.

10.37 Since the introduction of the charge control in October 2019 Ofcom has only received one complaint relating to 070 numbers (which 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.[250] It suggests that the charge control may be effective in reducing the risk of fraud on the range. If so, we consider the risk would re-emerge, were the cap on 070 termination rates to be removed.

International artificial inflation of traffic (AIT)

10.38 AIT occurs because some international telecoms providers fail to distinguish in their retail charging between calls to UK mobiles and 070 calls. This means that, prior to the implementation of the charge control, their retail call prices were below 070 termination charges, enabling fraudulent users to generate revenues by sending high volumes of call traffic to their own numbers.

10.39 As noted, there is some evidence that call volumes to 070 numbers have fallen dramatically since the implementation of the charge control, and this may be a consequence of AIT no longer being profitable. We consider that there would be an ongoing risk of AIT, were the cap on 070 termination rates to be removed.

[249] 2018 070 Market Review Statement, paragraph 4.24.
[250] 2018 070 Market Review Statement, paragraph 4.13.

10.40 Accordingly, we consider that there is a material risk of harm as a result of SMP on the 070 range, which it is appropriate to address by means of a charge control on termination rates.

Our approach to setting a charge control

10.41 The current charge control on 070 termination rates is set at the same rate as the price cap on mobile termination rates.

10.42 The 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').[251] Accordingly, we continue to 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.

10.43 In addition, tying 070 termination rates to mobile termination rates should incentivise operators to include 070 calls in bundles and/ or reduce 070 charges to a similar level as mobile charges. There is already evidence that this is beginning to occur, following the implementation of the charge control in October 2018, as set out in Figure 10.2 above.

10.44 A charge control at this level prevents 070 termination rates being set at an excessive level, reducing the incentive for the misuse 070 numbers through fraud or ATI, as described above.

10.45 Capping 070 termination charges at the MTR means that the termination rate is less than the 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 contribute to the cost of making calls on 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.

10.46 In light of the above, we propose to continue to set the 070 termination rate at the same level as the MTR.

Consultation questions

Question 10.1: Do you agree with our proposed market definition and SMP assessment for termination on the 070 number range? Please set out your reasons and supporting evidence for your response.

Question 10.2: Do you agree with our proposed remedies for operators holding SMP for termination on the 070 number range? Please set out your reasons and supporting evidence for your response.

[251] Ofcom, 2018. *The future of telephone numbering: qualitative research study* (by Futuresight), page 22

11. Donor Conveyance Charge

11.1 The Donor Conveyance Charge (DCC) is a charge associated with mobile number portability. Since 2014, it has been subject to a price cap which has been set at cost. However, after undertaking an analysis of how revenues and costs have evolved since 2014, we are now proposing that a price cap is no longer necessary and that it should not be retained.

11.2 Telecoms providers would remain subject to the general requirement that charges are reasonable, cost-orientated and based on incremental costs of provision. Our proposal brings our approach to DCC in line with the approach which exists for the porting conveyance charges charged by fixed providers, who are also subject to the same general requirement but not to a charge control.[252]

Background

11.3 Mobile number portability enables mobile subscribers, if they so wish, to retain their mobile number when they switch from one mobile provider to another. In that case, subscribers 'port' their numbers from their previous mobile provider to the new provider.

11.4 The UK currently does not have a centralised porting system, but instead uses a system of onward routing of calls to ported numbers. When the subscriber that has 'ported' their number receives an incoming call, it is first routed to the network that originally held the ported number (the 'donor provider'). The call is then identified by the donor provider as a call to a specific ported number and 'onward routed' to the mobile provider to whom the number has been ported (the 'recipient provider').

11.5 This system of onward routing for calls to ported mobile numbers results in costs for the donor provider which are recovered via the DCC.

Regulatory obligations

11.6 Mobile providers are currently required to set DCCs in accordance with their obligations in General Condition B3.6 (GC B3.6)[253] and a direction we made in 2018, which we explain below.

11.7 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-orientated and be based on the incremental costs of providing portability, unless either 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.

[252] Fixed providers also recover onward routing costs through porting conveyance charges known as average porting conveyance charges or APCCs.
[253] Ofcom, 2020. General Conditions of Entitlement: Unofficial Consolidated Version

DCC charge control

11.8 In 2014, Ofcom gave a direction setting a price cap on the DCC (the 2014 Direction).[254] 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 2015[255], the 2014 Direction was withdrawn and a new direction was made (the 2015 Direction) which set a price cap, based on a LRIC standard, of 0.023ppm for 2015/16, reducing to 0.022ppm for 2017/18.

11.9 In March 2018, after the 2015 Direction expired, we gave a further direction setting a price cap of 0.022ppm for 2018/19 which reduced to 0.021ppm for 2020/21 (the 2018 Direction).[256] The 2018 Direction will cease to have effect on 31 March 2021.

DCC revenues and relevant costs

11.10 As a result of the price cap, DCC revenues have significantly reduced. We estimate that in 2013/2014, prior to the introduction of the price cap, DCC revenues were roughly £12m,[257] representing almost 0.08% of total UK retail mobile revenues.[258] However, by 2016/17, total DCC revenues had fallen to around £3.4m[259], representing 0.02%[260] of total UK retail mobile revenues.[261]

11.11 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, volumes remain important, taking into account the total volume of mobile calls in 2019 was 161 billion minutes[262] and the fact that a significant proportion of switchers port their number each year – 68% in 2018[263], up from 57% in 2017.[264]

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[254] This direction was made pursuant to GC 18(a)(ii) which was renumbered to GC B3.6(a)(ii).
[255] Ofcom, 2015. *Review of Donor Conveyance Charges for the period 2015-2018*
[256] Ofcom, 2018. *Review of Donor Conveyance Charges for the period 2018-2021*
[257] 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.
[258] The total UK mobile retail revenues in 2013 were £15,559 million. Ofcom, 2014. *Telecommunications market data tables Q4 2013*, page 18, table 1.
[259] Based on revenue figures collected from mobile providers using our formal information gathering powers, the total volumes of DCC calls for 2016/17 were 14.76bn minutes and the DCC was on average 0.023 ppm.
[260] The total UK mobile retail revenues in 2016 were £15.335 billion. Ofcom, 2017. *Telecommunications market tables Q4 2016*, page 15.
[261] 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.
[262] Ofcom, 2020. *Telecommunications Market Data Update Q4 2019*
[263] Ofcom, 2018. *Switching experience tracker 2018*, page 48, table 11
[264] Ofcom, 2017. *Switching experience tracker 2017*, page 336, table 88.

Our Proposal

11.12 Number portability is important as a key facilitator of consumer choice and effective competition in electronic communications markets. In order to minimise obstacles to number portability, GC B3.6 requires that portability is provided on reasonable terms and that charges are reasonable, cost-orientated and based on incremental costs of provision.

11.13 Since 2014, we have secured this outcome by imposing a price cap on the DCC. However, we are proposing that this price cap will no longer be necessary for the following reasons:

a) Providers remain subject to GC B3.6, which requires them to set DCCs that are cost-oriented and based on the incremental cost of providing number portability.

b) The current level of the price cap provides a reasonable upper bound benchmark for a cost-orientated charge. In our 2018 cost modelling exercise[265], 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 those charges are cost-oriented.

c) As already explained above, revenues from DCCs are significantly lower than they were prior to the introduction of the price cap in 2014 and DCCs now represent a very small proportion of UK mobile revenues (0.02%). Accordingly, given the constraints noted in paragraphs (a) and (b) above, we do not expect changes to DCCs to have an adverse impact on competition or customers.

11.14 Given these factors, we consider that GC B3.6 and the enforcement mechanisms that are in place, including the ability of telecoms providers to bring disputes under section 185 of the Act, will be sufficient to keep DCCs low. Therefore, we consider that the burden of a further cost modelling exercise needed to set a specific price cap would be disproportionate given the limited benefits in terms of clarity and accuracy that it would achieve.

11.15 We consider that for the reasons above, our proposal is consistent with our principal duty under section 3 of the Act, and the Community requirements set out in section 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.

[265] 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.

Consultation questions

Question 11.1: Do you agree with the analysis and conclusion of our general position on not renewing the DCC price cap? Please provide reasons and evidence in support of your views.