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# **Business connectivity market review – Volume 1**

Market analysis, proposed SMP findings and remedies

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**CONSULTATION:**

**Publication Date:** 2 November 2018 [Updated on 19 December 2018]

**Closing Date for Responses:** 18 January 2019

# About this document

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Ofcom’s Business Connectivity Market Review (BCMR) examines the markets for the provision of leased lines in the UK. Leased lines are high speed, high-quality, point-to-point data connections that telecoms providers use for connecting offices, mobile base stations, and broadband access networks. As such, they are essential to support the provision of mobile, business, and residential broadband services and form the backbone of the UK’s digital infrastructure.

Every three years, Ofcom conducts a review of competition in the markets for the provision of leased lines in the UK. Where we find that a provider has “significant market power” (SMP) in a market (i.e. that they can act independently of competition) we impose regulations designed to address concerns about the impact of that market power on competition.

This document consists of two volumes with supporting annexes:

- Volume 1 sets out our provisional analysis of business connectivity markets, identifies markets in which we propose to find that a provider has SMP, and sets out what remedies we propose to impose to address such SMP.
- Volume 2 sets out our proposed detailed design of the price caps, as set out in the remedies sections of Volume 1, which aim to prevent excessive pricing where there is little prospect of competition developing.

The deadline for responses is 18 January 2019. Annexes 1 to 3 set out the process for responding to the consultation. We will take all responses to this consultation into account before reaching our final conclusions, which we expect to publish in spring 2019.

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# 1. Executive summary

## Regulatory certainty to support long-term fibre investment

- 1.1 Ofcom’s strategy is to promote investment and competition, complemented by timely public interventions where there is no commercial case to build networks. Delivering better broadband for people and businesses can be done technically in a number of ways. In general, more fibre technology is critical: enabling better services through full-fibre networks, dedicated business connections, and providing connections to current 4G, and new 5G mobile base stations.
- 1.2 We want to enable more fibre investment by alternative network operators and Openreach alike and to ensure that investment is not limited to meeting demand from one set of customers or another.
- 1.3 In July 2018, we set out a roadmap of actions to support competitive investment in fibre networks.<sup>1</sup> It had the following key elements:
- looking at business and residential markets more holistically;
  - introducing unrestricted duct and pole access;
  - different regulatory approaches in different parts of the country – depending on the level of competition;
  - longer-term certainty, with competition assessments rising from every three years currently, to at least five;
  - incentivising Openreach to invest by providing the opportunity of higher returns on risky investments; and
  - a smooth transition from older copper networks to fibre technology.
- 1.4 By 2021, we intend to implement a consolidated review of residential and business telecoms markets and physical infrastructure. Before then, we are taking certain steps to both facilitate our new consolidated review and to implement certain key elements of our strategy more quickly:
- **Business Connectivity Market Review:** In this document, we set out proposals for the business connectivity market during this period. Given the regulation in business markets will expire in March 2019, we need to refresh it before we carry out a single market review for business and residential markets holistically in 2021. This is a short review as we transition to our longer-term model for regulation, but we have included elements to ensure consistency with our longer-term direction.
  - **Physical Infrastructure Market Review:** Publishing in parallel with this consultation is our consultation on the PIMR. In this, we set out proposals to give unrestricted access to Openreach’s network of underground ‘ducts’ and telegraph poles, so companies have greater flexibility to lay fibre networks that serve residential or business

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<sup>1</sup> Ofcom, 2018. *Regulatory certainty to support investment in full-fibre broadband – Ofcom’s approach to future regulation* <https://www.ofcom.org.uk/...../investment-full-fibre-broadband.pdf>.

customers. At present, duct and pole access is restricted to networks focusing primarily on the residential market. We intend to implement unrestricted duct access from spring 2019.

1.5 Over the coming months we intend to set out the different elements of our holistic approach to regulation of business and residential markets, which will take effect from spring 2021:

- **initial consultation on geographic markets:** by the end of the year, we will set out our initial proposals for how downstream competition assessments and regulation may vary by geography. Geographic markets will feature in our future holistic residential and business market review in 2021. As set out in July, in the markets for wholesale access to networks, we anticipate proposing that:
  - in areas that are effectively competitive, based on ultrafast networks already built, Openreach will no longer be required to provide wholesale access to its services;
  - in areas where non-Openreach full-fibre networks are being built, or are likely to be built, we impose remedies to incentivise investment while ensuring consumers remain protected until this network competition becomes effective; and
  - in areas where we think non-Openreach full-fibre networks will not be built, we protect consumers while supporting investment by Openreach.
- **initial consultation on approach to remedies:** by spring 2019, we intend to set out in more detail the approach to remedies that we think will best achieve the objectives of our holistic approach; and
- **consultation on formal proposals:** by autumn 2019 we will draw together these threads and consult on our proposed market analysis and full package of remedies, which will replace all existing regulation from spring 2021.

**Table 1.1: Expected timing of market regulation**

	2018/19*		2019/20				2020/21				2021/22
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
<b>WLA</b>	●  WLA										
<b>BCMR</b>	●  BCMR										
<b>PIMR</b>	●  PIMR										
<b>Future approach to regulation of business and residential markets</b>											
• Initial consultation on approach to geographic markets	●										
• Initial consultation on approach to remedies		●									
• Consultation on formal proposals						●					
• Statement for ongoing PIMR and downstream remedies										●	
• <b>Integrated market review</b>											 Continues to 2025/26

Key: ○ Statement/Consultation     Period of regulation    ● Complete

\*Note: Financial years, starting 1 April e.g. Q1 is April, May, June

## Review of business connectivity markets

- 1.6 People in the UK are consuming more and more data. Demand for online services, mobile data and business demand for increased productivity and new applications have driven an increase in the capacity of UK networks of between 20-25% per year.<sup>2</sup>
- 1.7 The majority of this traffic is carried on high-speed, high-quality, point-to-point data connections that telecoms providers use for connecting offices, mobile base stations, and broadband access networks. These are known as ‘leased lines’ and form the backbone of the UK’s digital infrastructure.
- 1.8 This document is a consultation on our review of competition for leased lines, known as the Business Connectivity Market Review (BCMR). This review covers the period to March 2021 and will segue into our combined review of network regulation for business and residential services which will run from that date for at least five years.

### Our key proposals on market definition and significant market power are:

We propose finding two separate product markets for **contemporary interface (CI) services** (e.g. connections over fibre using an Ethernet interface):

- access services, which are the connections to end-user business sites (e.g. office buildings or mobile base stations); and
- inter-exchange connectivity, which are the connections between BT exchanges in different geographic areas (e.g. between towns and cities).

For each of these markets, we propose identifying a single product market covering all bandwidths.

In the **CI Access services** market, we identify separate geographic markets, based on network competition. We propose finding that BT has significant market power (SMP) in CI Access services in each of the geographic markets across the UK, except in the Central London Area (CLA) and the Hull Area.

In the **CI Inter-exchange connectivity** market, we propose finding that BT has SMP at its exchanges where it faces competition from fewer than two other operators.

We also currently regulate some legacy **traditional interface (TI) leased lines** which provide low speed services (up to 8 Mbit/s), mainly over copper lines. Volumes of TI leased lines are low and falling as users migrate to modern alternatives. We are therefore proposing to deregulate TI services throughout the UK.

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<sup>2</sup> Ofcom analysis of operator circuit data.

### Our key remedy proposals are:

For **CI Access services**, in areas where BT faces competition from two or more rivals we are not proposing charge controls or quality of service standards.

In areas with no or limited competition (BT Only or BT+1 competitor) in both the **CI Access** and **Inter-exchange connectivity** markets, we are proposing to keep prices flat and have strict quality of service standards at all bandwidths.

We are also proposing that BT provides access to **dark fibre**<sup>3</sup> at cost in the **Inter-exchange connectivity** market for connections from BT Only exchanges. We are not proposing to extend the requirement for dark fibre further in this review, to minimise overlap with areas where we think our unrestricted duct and pole access proposals will be effective in stimulating investment in new networks.

- 1.9 The remedies we propose take into account our proposals for unrestricted access to BT's ducts and poles. We have also taken account of the need to provide certainty and stability over this shorter two-year period, in advance of our combined review of wholesale network regulation.
- 1.10 We have separate proposals for the Hull Area, where KCOM is the incumbent supplier.

### Our key SMP and remedy proposals for the Hull Area are:

We propose to find that KCOM has SMP in the wholesale CI Access market, but plan to deregulate the Hull Area retail market following market entry by other players. We propose to maintain the existing requirement on KCOM to provide network access on reasonable request and on fair and reasonable charges, terms and conditions.

## Our market analysis

- 1.11 In this review, we differentiate between the services BT provides to connect end-user sites (CI Access services), and the services that connect its exchanges (CI Inter-exchange connectivity) as illustrated in Figure 1.2.

### CI Access

- 1.12 Once a supplier has connected its network to a customer site (e.g. an office), it can offer services at any bandwidth and can change between providing different bandwidths quickly and at minimal cost. We therefore propose finding a single product market at all bandwidths for CI Access services.
- 1.13 To understand how competition varies geographically we have divided the UK into areas based on the number of competing networks. We categorise the areas as:

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<sup>3</sup> Dark fibre is where a fibre has no electronics attached to 'light' the fibre for data transmission i.e. it is passive.

- BT Only
- BT+1 competitor
- BT+2 or more competitors – High Network Reach areas

1.14 In our analysis of how competition varies geographically, we have analysed the High Network Reach areas in particular detail. We have provisionally found that the Central London Area (CLA)<sup>4</sup> has different conditions of competition from those in other HNR areas.

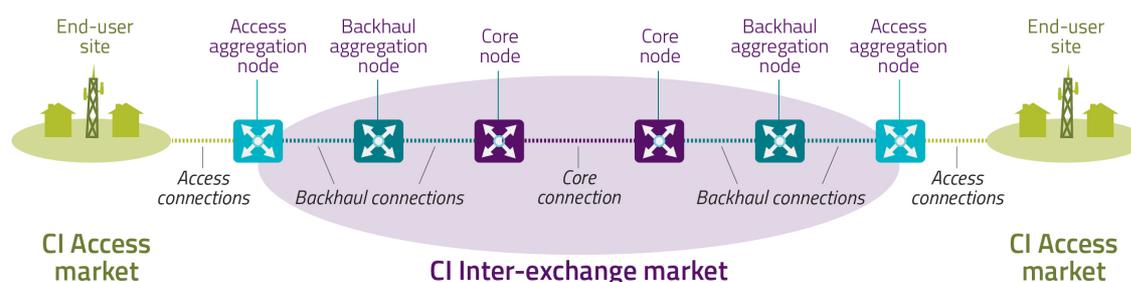
1.15 The potential for competition increases the more networks a customer has close to their premises. However, while in theory it is profitable for BT's rivals to dig short distances to connect new customers, in practice they rarely do so. Only in the CLA, where rival networks have a connection to a high percentage of customer buildings, do rivals use their own networks to a large extent. We therefore propose finding that effective competition in **CI Access** is limited to the CLA and that BT has SMP in the rest of the UK, excluding the Hull Area.

## CI Inter-exchange connectivity

1.16 To use wholesale access remedies (whether for home broadband or for leased lines), telecoms providers need to send data between BT exchanges to connect to their own networks. Supply of this inter-exchange connectivity on competitive terms is therefore critical to the effectiveness of our proposed remedies in the CI Access market.

1.17 BT has almost 5,600 local exchanges. BT faces competition from fewer than two competitors at c.5000 of these. We are therefore proposing to find that BT has SMP at these locations.

**Figure 1.2: Illustration of CI Access and CI Inter-exchange connectivity**



## Legacy services

1.18 We currently regulate low bandwidth (up to 8 Mbit/s) legacy traditional interface (TI) leased lines. There are clear dynamics in this rapidly declining market that suggest

<sup>4</sup> The Central London Area (CLA) is an area of especially dense concentration of businesses and competing networks, defined in the 2016 BCMR. The CLA broadly corresponds to the Central Activities Zone defined by the Greater London Authority as London's business centre, accounting for a third of London's jobs and 10% of the UK's economic output.

regulation is no longer justified for these services. We are proposing to deregulate low bandwidth TI services throughout the UK, including the Hull Area.

## **Our proposed remedies**

### **Reducing regulation where there is prospective competition**

- 1.19 Our geographic analysis for CI Access services shows that there are places outside the Central London Area where BT faces competition from two or more rivals. We refer to these as High Network Reach areas that include six Metro Areas in Birmingham, Bristol, Edinburgh, Glasgow, Leeds and Manchester.
- 1.20 The competitive conditions in these areas are still at a level where we propose to find that BT has SMP. However, we think the conditions of competition now justify a different approach to regulation. We propose lighter regulation to give network competition a greater chance to flourish. We will no longer impose a cost-based charge control or quality of service standards on BT's wholesale services in those areas. In the absence of controls over price and quality, we expect BT's rivals to have a stronger incentive to build their networks, enabled by access to BT's ducts and poles, to take advantage of commercial opportunities.

### **Protecting customers where network competition is unlikely**

- 1.21 In areas where BT does not face competition from two or more rivals, the prospects for competition in the near term are low, even with improved duct and pole access, though this may change in future as duct and pole access becomes established. We have taken into account our intention to undertake a comprehensive review of wholesale access markets in 2021, and therefore we have proposed a price cap for services at 1 Gbit/s and below to protect customers and provide certainty and stability over the course of this short review.
- 1.22 Services at speeds over 1 Gbit/s are not currently subject to charge controls. We expect demand for these services to continue to grow as networks expand and data consumption increases. Our proposals for duct and pole access will lead to an increase in competition, which is likely to focus on higher speed services. We are concerned that BT may selectively raise prices for services over 1 Gbit/s where competition is weak or non-existent and leverage higher returns to reduce prices where competition is likely to emerge. To prevent this, we propose a safeguard cap at current prices.

### **Dark fibre for inter-exchange connectivity**

- 1.23 Today we are also proposing unrestricted duct and pole access to BT's network, which we expect in time to enable network-based competition in a significant proportion of the UK.
- 1.24 There are some areas where duct and pole access will be unlikely to have a material impact on competition. We have focused on the c.4,300 exchanges where BT faces no competition from rival operators for inter-exchange connectivity. Telecoms providers who purchase

wholesale access services from these exchanges have no choice but to use BT as their supplier for backhaul links. Rival networks are too far from these exchanges to make it economically viable to serve these exchanges, even with duct and pole access. Given the low likelihood of network competition, we propose a requirement for dark fibre at cost for inter-exchange circuits that connect to these locations.

- 1.25 It is likely there will be other areas where duct and pole access will not lead to greater network competition. In 2021, when we conduct our wide-ranging review, we will assess additional areas where dark fibre may be an appropriate remedy.

### Continuing controls over quality of service

- 1.26 When we first imposed quality of service regulation for leased line services, BT's provision of new Ethernet circuits was in crisis. Lead times were excessive, and customers faced multiple changes of delivery date. Confidence in BT's ability to supply on time was very low.
- 1.27 Following the introduction of standards, Openreach has improved service quality and customer confidence is returning. In our view, the structure of regulation we put in place is working. Openreach's progress is encouraging, but it is too early to relax or withdraw quality of service regulation. Performance can and should continue to improve, and we therefore propose to broadly maintain the current regulated quality standards for the next review period.

**Table 1.1: Summary of pricing and quality of service remedies for the CI Access and CI Inter-exchange markets**

	Inter-exchange market			Access market			
Operator:	BT Only	BT+1 other	BT+2 or more	BT Only	BT+1 other	BT+2 or more (HNR areas)	
Bandwidth						Outside CLA	CLA
<b>1 Gbit/s and below</b>	Cap at current prices for stability QoS standards		None	Cap at current prices for stability QoS standards		Fair pricing <sup>(3)</sup>	None
<b>Over 1 Gbit/s (VHB)</b>	Safeguard cap at current prices QoS standards <sup>(1)</sup>		None	Safeguard cap at current prices QoS standards <sup>(1)</sup>		Fair pricing <sup>(3)</sup>	None
<b>Dark Fibre, any bandwidth</b>	Price at cost QoS standards <sup>(2)</sup>	None	None	None	None	None	None

Note: QoS standards (1) for Ethernet only (2) for Dark Fibre, from year 2 (3) Key Performance Indicators only.

## The Hull Area

- 1.28 In the Hull Area, rival networks have reduced KCOM's market share of CI Access services at both the wholesale and retail level since our last review. KCOM's retail market share has dropped to below 40% and at least four operators are now competing for CI Access services at the retail level. Our analysis of retail services in the Hull Area is that regulation is no longer appropriate and so we are proposing to remove SMP regulation.
- 1.29 Competitor entry has also taken place at wholesale level, with CityFibre in particular winning significant contracts. While wholesale competition is emerging, the reduction in KCOM's market share, and increased competition from rival networks, it is not yet at a level where we think there will be effective wholesale competition. We therefore propose finding that KCOM continues to have SMP in the supply of wholesale CI Access services in the Hull Area.
- 1.30 We propose to maintain our existing approach to price controls in the Hull Area, requiring KCOM to:
- provide network access on reasonable request and on fair and reasonable charges, terms and conditions;
  - publish its wholesale charges in its Reference Offer and not to depart from them; and
  - produce a Pricing Transparency Report.

## Next steps

- 1.31 The deadline for responses to this document is 18 January 2019. Annexes 1 to 3 set out the process for responding to the consultation. We will take into account all responses before reaching our final conclusions, which we expect to publish in spring 2019.

## 2. Background

2.1 In Volume 1 of this document we set out our proposals for market definition, SMP and remedies in the business connectivity markets in the UK from spring 2019 to 31 March 2021. In Volume 2 we set out our proposed charge controls for certain services in these markets. Business connectivity services are described in more detail in Section 3.

2.2 In this section we:

- briefly set out the regulatory context within which this review is taking place;
- summarise the current regulation in these markets, and explain how the Competition Appeal Tribunal's (Tribunal) findings in relation to market definition have informed the approach we have taken in our analysis; and
- explain the market review process and legal framework.

### Regulatory context

#### Strategic Review

2.3 In our Strategic Review of Digital Communications (Strategic Review),<sup>5</sup> we set out how we would promote investment and competition to deliver better broadband wherever people live and work. The steps we have taken since then include:

- **Focusing on large-scale full-fibre investment through our regulatory decisions.** We required Openreach to open up its network of telegraph poles and underground cable ducts to allow rivals to lay their own fibre. We also set prices for Openreach's wholesale services in a way that supported investment.
- **Reforming Openreach through BT's voluntary commitment to legal separation.** Under the new arrangements, Openreach must consult formally with its telecoms provider customers on large-scale investments. The new model is designed to ensure that Openreach is more responsive to the demands of all its customers – not just BT – and increases its fibre investment.
- **Improving quality of service across the telecoms industry.** We have set tougher quality standards on Openreach, particularly for business products, where service was previously unacceptable.

#### Implementing our strategy

2.4 In our July 2018 Strategic Policy Position,<sup>6</sup> we set out in more detail what our strategy would mean for the markets we currently regulate.

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<sup>5</sup> Ofcom, 2016. *Making communications work for everyone: Initial conclusions from the Strategic Review of Digital Communications*. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0016/50416/dcr-statement.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0016/50416/dcr-statement.pdf).

<sup>6</sup> Ofcom, 2018. *Regulatory certainty to support investment in full-fibre broadband – Ofcom's approach to future regulation*. [www.ofcom.org.uk/.../investment-full-fibre-broadband.pdf](http://www.ofcom.org.uk/.../investment-full-fibre-broadband.pdf).

- 2.5 Historically, while copper and fibre-to-the-cabinet networks could meet the needs of most households and small businesses, large businesses and communications providers needed high-speed, dedicated leased lines. As a result, it made sense to review these markets separately. We have done so through the wholesale local access (WLA) review, which examines the wholesale services used by telecoms providers to supply broadband to their customers; and the BCMR.
- 2.6 We explained in our Strategic Policy Position that, since the same underlying fibre network will increasingly be used to deliver a range of different services for business and residential customers, it makes sense to consider residential and business access markets together.
- 2.7 To reflect the technical capabilities of full-fibre networks, our new approach to reviewing telecoms markets needs to recognise the importance of physical infrastructure. We will now consider access networks and services more holistically, focusing first on continuing to open up Openreach’s physical infrastructure.
- 2.8 Taking a network-focused approach means that we will need to assess competition at two levels. Our first, upstream assessment will focus on physical telecoms infrastructure, such as ducts and poles. Our second, downstream assessment will consider the need for wholesale regulation depending on where there are competing networks, or where competing networks have a good prospect of emerging.
- 2.9 Alongside this document, we have published our proposals for unrestricted duct and pole access (DPA). We plan to consult further on our approach to geographic markets and wholesale access regulation over the course of 2019 and 2020, with a view to having new regulation for downstream services in place to take effect from April 2021.

## Summary of existing regulation

- 2.10 Our last review of the business connectivity markets concluded in 2016.<sup>7</sup>
- 2.11 We defined a single product market for contemporary interface (CI) services of all bandwidths, on the basis that a chain of substitution linked all such services, and that they can all be provided using the same physical access infrastructure. This market excluded certain lines connecting BT exchanges and carrier neutral data centres, which we referred to in 2016 BCMR as the CI core.<sup>8</sup>
- 2.12 A key implication of our product market finding was that the degree of choice of alternative infrastructure was the main determinant of the effectiveness of competition in supply of CI services in a given area. We used detailed data on the location of telecoms network infrastructure to examine competitive conditions by geography. This allowed us to distinguish between areas with different competitive conditions.

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<sup>7</sup> Ofcom, 2016. *Business Connectivity Market Review* <https://www.ofcom.org.uk/consultations-and-statements/category-1/business-connectivity-market-review-2016>.

<sup>8</sup> Our current assessment of the equivalent of the CI core can be found in our discussion of inter-exchange connectivity, which is found in Section 7.

- 2.13 Based on the differences in competitive conditions between geographic areas, we defined four distinct geographic markets: the Central London Area (CLA), the London Periphery, the Hull Area and the Rest of the UK (RoUK).
- 2.14 We found that:
- no telecoms provider had SMP in the provision of retail leased lines outside of the Hull Area;
  - no telecoms provider had SMP in the CLA, and removed existing regulation in that area;
  - the extent of competition in the CI core had increased, and deregulated a number of BT exchanges and carrier neutral data centres accordingly;
  - BT had SMP in the wholesale CI services market in the London Periphery and in the RoUK. In those markets, we imposed a package of remedies on BT including a requirement to provide dark fibre, a so-called passive` remedy which allowed telecoms providers to lease only the fibre element of the leased lines from BT, allowing them to attach equipment of their own choosing at either end to light the fibre and use it as the basis for offering a range of leased lines products;<sup>9</sup> and
  - KCOM had SMP in the CI services market in the Hull Area at both the retail and wholesale levels, and imposed appropriate remedies.
- 2.15 We defined a separate product market for traditional interface (TI) services, as we had in previous reviews, because we found there was little prospect of competitive entry in the provision of these legacy products, as volumes were declining. We defined two geographic markets for TI: the UK excluding the Hull Area, and the Hull Area. We deregulated very low bandwidth (below 2 Mbit/s) retail TI leased lines in the UK excluding the Hull Area, and wholesale TI services over 8 Mbit/s in the UK and in the Hull Area.

## Appeal

- 2.16 BT appealed on various issues related to the 2016 BCMR market definition and remedies. The Tribunal heard BT's appeal in relation to market definition. The Tribunal handed down its judgment on 10 November 2017 (the BCMR Judgment), in which it concluded that Ofcom had erred in:
- concluding that it was appropriate to define a single product market for CISBO services of all bandwidths;
  - concluding that the RoUK comprises a single geographic market; and
  - its determination of the boundary between the competitive core segments and the terminating segments of BT's network.<sup>10</sup>
- 2.17 The Tribunal set out at paragraphs 465-479 of the BCMR Judgment a summary of its findings in relation to market definition.

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<sup>9</sup> See Section 3.

<sup>10</sup> Competition Appeal Tribunal, 2017, CAT 25.

[http://www.catribunal.org.uk/files/1260\\_BT\\_Judgment\\_CAT\\_25B\\_101117.pdf](http://www.catribunal.org.uk/files/1260_BT_Judgment_CAT_25B_101117.pdf) [accessed 30 October 2018].

- 2.18 The Tribunal did not substitute its own findings in relation to any of the above matters, and the matters were therefore remitted to us for reconsideration (Remitted Matters).
- 2.19 Our proposals as set out in this document deal with the Remitted Matters. In particular, in Sections 4, 5 and 7 we have set out our approach to market definition in light of the Tribunal’s findings in the BCMR Judgment.

## Regulation currently in place

### The Hull Area and Traditional Interface services

- 2.20 The Tribunal dealt only with matters relating to BT’s wholesale CI services. The regulation we put in place for the Hull Area and wholesale TI services remains as implemented in the 2016 BCMR.

### The Temporary Conditions

- 2.21 We recognised that it would take some time to complete the new analysis required to deal with the Remitted Matters and considered what steps were appropriate to safeguard competition and protect the interests of consumers in the intervening period before we were able to put new remedies in place.
- 2.22 Under the Communications Act 2003 (the Act), Ofcom has the power to make temporary arrangements for reasons of urgency and where exceptional circumstances apply. We therefore imposed temporary regulation in business connectivity markets (Temporary Conditions) to safeguard competition and protect the interests of consumers until the new analysis is complete.<sup>11</sup> At the same time we revoked existing regulation where it was impacted by the BCMR Judgment.<sup>12</sup> We noted that, given the urgent nature of our decisions, and the fact that we were taking them without consultation, we had taken a conservative approach to our SMP determination.<sup>13</sup>
- 2.23 We identified a Lower Bandwidth CISBO (up to and including 1 Gbit/s) product market only. This means that CI services over 1 Gbit/s are currently unregulated.
- 2.24 We identified the following geographic markets:
- the CLA;
  - the London Periphery;
  - central business districts (CBDs) in Birmingham, Bristol, Glasgow, Leeds and Manchester; and
  - the RoUK excluding the CBDs.
- 2.25 We determined that BT has SMP:
- in a market comprising Lower Bandwidth CISBO services in the London Periphery;

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<sup>11</sup> Ofcom, 2017. *Business Connectivity Markets: Temporary SMP conditions in relation to business connectivity services*. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0019/108019/BCMR-Temporary-Conditions.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0019/108019/BCMR-Temporary-Conditions.pdf).

<sup>12</sup> Ofcom, 2017. *Revocation of certain measures imposed in the business connectivity markets*. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0018/108018/BCMR-Revocation-Notification.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0018/108018/BCMR-Revocation-Notification.pdf).

<sup>13</sup> Temporary Conditions, paragraph 2.8.

- in markets comprising Lower Bandwidth CISBO services in the CBDs of Bristol and Manchester; and
  - in a market comprising Lower Bandwidth CISBO services in the RoUK excluding the five CBDs.
- 2.26 We also defined the CI Core for the purposes of our temporary SMP conditions and directions.<sup>14</sup>
- 2.27 The Temporary Conditions expire on 31 March 2019.
- 2.28 At the same time that we imposed the Temporary Conditions we consulted on proposals to impose, for the same period, a limited dark fibre remedy restricted to bandwidths of up to and including 1 Gbit/s.<sup>15</sup> We confirmed in April 2018 that in light of stakeholder responses we would not impose a temporary dark fibre remedy for the period until March 2019.<sup>16</sup> However, we re-confirmed our view that dark fibre can play an important role in promoting competition in leased lines.

## Regulatory framework

- 2.29 The regulatory framework for market reviews is set out in UK legislation and is transposed from five EU Directives. These Directives impose a number of obligations on relevant regulatory authorities, such as Ofcom, one of which is to carry out periodic reviews of certain electronic communications markets.<sup>17</sup> This market review process is carried out in three stages:
- identifying and defining relevant markets;
  - assessing whether the markets are effectively competitive, which involves assessing whether any operator has SMP in any of the relevant markets; and
  - where SMP is found, assessing the appropriate remedies, based on the nature of the competition problems identified in the relevant markets.
- 2.30 We set out the applicable regulatory framework in Annex 5, and our approach to product market definition, geographic market definition and SMP assessment in Sections 4, 5 and 6 respectively.
- 2.31 When defining markets, making SMP determinations and imposing regulatory obligations, we must satisfy various legal tests, take account of certain European Commission and BEREC publications and act in accordance with our statutory duties. We explain in Sections 11-16 and Volume 2, Section 5 (with respect to our proposed charge controls) why we consider that our proposals satisfy the relevant legal tests, are consistent with our statutory duties and how we have taken account of relevant publications.

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<sup>14</sup> We also deregulated 11 BT exchanges which we determined did not meet the criteria for regulation. Temporary Conditions, paragraph 2.109.

<sup>15</sup> Ofcom, 2017. *Consultation on adding dark fibre to the remedies for business connectivity markets*. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0014/108032/Dark-Fibre-Consultation.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0014/108032/Dark-Fibre-Consultation.pdf).

<sup>16</sup> Ofcom, 2018. *Statement on adding dark fibre to the temporary remedies for business connectivity markets*. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0015/112902/dark-fibre-statement.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0015/112902/dark-fibre-statement.pdf).

<sup>17</sup> We set out the applicable regulatory framework and the approach to market definition and SMP assessment in more detail in Sections 4, 5 and 6.

## Forward look

- 2.32 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 2021, reflecting the characteristics of the retail and wholesale markets and the factors likely to influence their competitive development.
- 2.33 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 judgement to reach decisions on the evidence before us with a view, ultimately, to addressing the competition concerns we identify to further the interests of citizens and consumers in these markets.

## Impact assessment and equality impact assessment

### Impact assessment

- 2.34 This consultation document, including its annexes, constitutes an impact assessment for the purposes of section 7 of the Act.
- 2.35 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 policy-making. 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. 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 (EIA)

- 2.36 Annex 6 sets out our EIA for this market review. We are required by statute to assess the potential impact of all our functions, policies, projects and practices on equality. We have a general duty under the 2010 Equality Act to advance equality of opportunity in relation to age, disability, sex, gender reassignment, pregnancy and maternity, race, religion or belief, and sexual orientation. EIAs also assist us in making sure that we are meeting our principal duty of furthering the interests of citizens and consumers regardless of their background or identity.
- 2.37 It is not apparent to us that the outcome of our review is likely to have any particular impact on equality. More generally, we do not envisage the impact of any outcome to be to the detriment of any group of society. Nor do we consider it necessary to carry out separate EIAs in relation to race or sex equality or equality schemes under the Northern Ireland and Disability Equality Schemes.

## Consultation

- 2.38 This consultation sets out our proposed market definitions, SMP findings and remedies (including price controls) in the business connectivity markets from spring 2019 to 31 March 2021. Our proposals are informed by evidence including formal information requests and discussions with stakeholders, to which we refer in our analysis. We have published a number of non-confidential submissions from stakeholders, as supporting documents, alongside this consultation.
- 2.39 The deadline for responses to this consultation is 18 January 2019. Annexes 1 to 3 set out the process for responding to the consultation.

### 3. Market context

3.1 In this section we first provide an introduction to business connectivity networks covering:

- a general overview of network structures;
- the main applications of business connectivity services including a brief review of the leased line supply chain;
- the main types of product used to provide business connectivity; and
- the underlying cost drivers associated with providing leased lines.

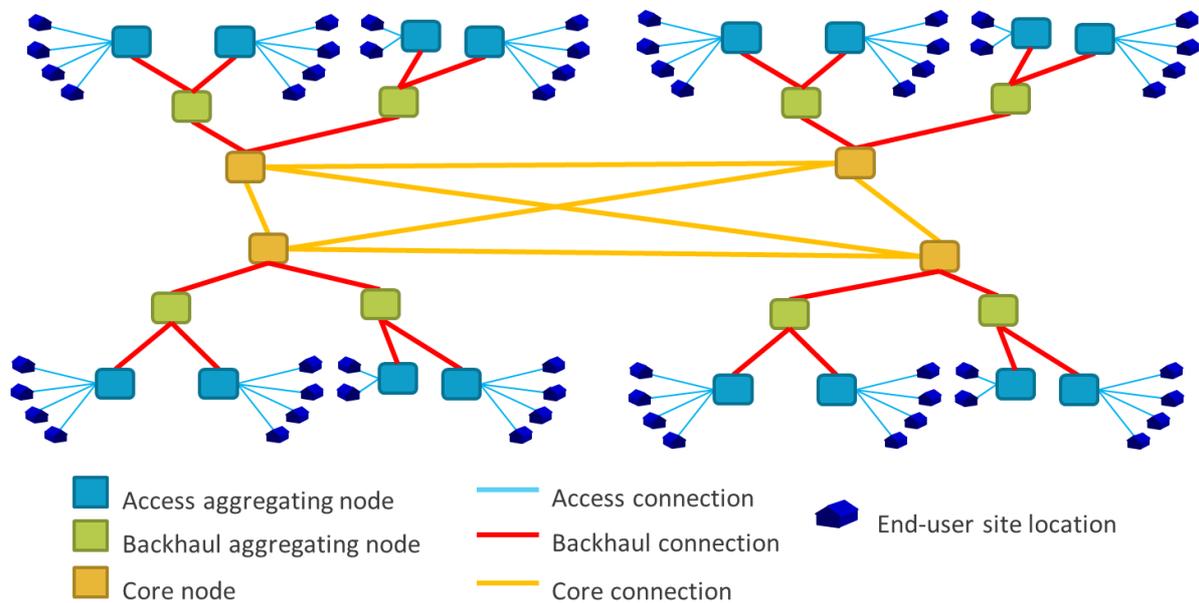
3.2 We then set out some of the features of how the business connectivity market works, including market trends and future demand by customer type.

### Introduction to business connectivity

#### Introduction to networks

3.3 A communications network provides the services that enable end-users to exchange information. A network routes its communication services through its network nodes<sup>18</sup> and connections between them. The nodes are often located in buildings such as BT exchanges, switching centres, data centres, and telecoms providers’ buildings. Figure 3.1 sets out how the nodes and connections are logically arranged in a typical network.

Figure 3.1: Illustration of logical arrangement of a communications network



<sup>18</sup> Nodes and connections in this context are considered to be combinations of electronic and optical equipment. Buildings or sites in this context house the nodes.

- 3.4 Each end-user site is connected to one of the network's access aggregation nodes.<sup>19</sup> This is referred to as the 'access connection'. Each access node is connected to at least one core node, either directly or indirectly, via a backhaul aggregating node<sup>20</sup> using a backhaul connection.<sup>21</sup> Core nodes are usually, but not necessarily, directly connected to each other to form what is known as a core network.<sup>22</sup> In general, there are more access nodes than backhaul nodes and more backhaul nodes than core nodes.
- 3.5 This structure is common to the networks used to provide most voice and data communications services – such as PSTN, mobile, broadband, and leased lines. These networks differ in scale (numbers of each type of node), the number of stages of access and backhaul aggregation (zero, one or more than one) and the structure of the core.
- 3.6 Access aggregation nodes are generally placed where customers are grouped most closely and can be easily reached, such as at the centre of cities, towns, and villages, and are used to connect customer access connections to the network. Backhaul connections (and nodes) have higher capacity as they aggregate traffic from multiple access nodes and can act as the point of connection between access nodes which can be many kilometres apart.
- 3.7 Core connections (and nodes) may transport more communications services due to aggregation of backhaul traffic and generally have higher capacity than backhaul connections (and nodes). Core nodes are typically located in a city of significant population within the geographic area covered by the network. Core nodes typically route (or switch) between other core nodes, and act as points of connection to other networks. Backhaul and access aggregating nodes support progressively smaller areas and populations and may also act as points of connection to other networks.
- 3.8 Most sites housing core nodes also contain backhaul and access aggregating nodes (also referred to as simply backhaul and access nodes), the latter for serving the area immediately surrounding the site. We refer to a site housing a core node as a 'core site'. Similarly, a site containing a backhaul node may also contain one or more access nodes to provide connectivity to the surrounding area. These sites with backhaul nodes are sometimes referred to as a backhaul exchange. More remote network sites may only contain an access node.

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<sup>19</sup> Access aggregating nodes aggregate the traffic from access connections and may also be referred to as access nodes. The access connection may be transmitted over radio, fibre, or copper.

<sup>20</sup> Backhaul aggregating nodes may also be referred to as backhaul, aggregating, or metro nodes. A backhaul aggregating node multiplexes the backhaul connections (or data traffic flows) onto a common bearer in a way that maintains the individual identity of each aggregated backhaul connection.

<sup>21</sup> Access or aggregating (backhaul) nodes may be connected to two or more core nodes to create a resilient network by providing alternative routing in the event of failure of a core node or backhaul connection.

<sup>22</sup> Core nodes are used to route or switch traffic between other core nodes. They are sometimes further divided into a hierarchy of outer core edge nodes and inner core nodes. Most core nodes have duplicate connections between them to provide resilience in the event of a failure in the network equipment or connection.

3.9 To enable communication between different networks,<sup>23</sup> networks can be interconnected between designated nodes. The network-to-network interconnect may be at a site (point of handover) where both networks are present, such as at a BT exchange or a data centre, or via a dedicated point-to-point connection between two network sites (the points of connection).<sup>24</sup>

### Access and inter-exchange connectivity

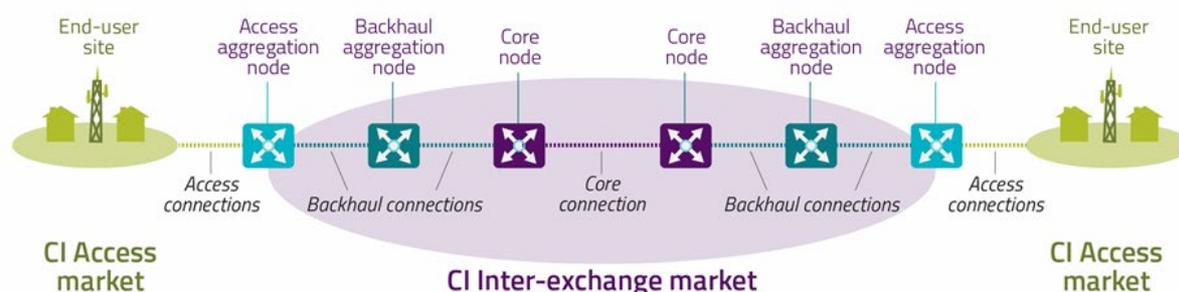
3.10 Access, backhaul and core connections have different functions:

- access connections are between end-user sites and an access aggregating node;
- backhaul connections are between access and backhaul nodes and from a backhaul to a core node; and
- core connections are between core nodes.

3.11 In this document, illustrated in Figure 3.2 below, we refer to:

- **“Access”**: access connections between end-user sites and an access aggregating node site (such as a BT exchange)<sup>25</sup>, also referred to as access segments; and
- **“Inter-exchange connectivity”**: the backhaul and core connections between network aggregation nodes, also referred to as backhaul segments.

**Figure 3.2: Access and inter-exchange connectivity**



3.12 In this market review, we have carried out separate market analysis for access and inter-exchange connectivity services. This is because the customers and nature of competition differs between these services. Demand for access services comes from end-users with a dedicated connection to each end-user site. Competition in the CI Access market arises from the potential for rival suppliers to extend their fibre networks to end-user sites, and is covered in more detail in Sections 3-5.

<sup>23</sup> For example between two different business users, or between a business user and a serving computer such as a web server in a data centre, or simply between two network operators.

<sup>24</sup> Openreach provides products to connect between nodes within a BT exchange (Internal Cablelink) and to connect to other networks nearby (External Cablelink).

<sup>25</sup> Some networks have small access aggregation nodes between the end-user site and the access aggregation site (such as cabinets with FTTC DSLAMs or a mobile base station with a fixed connection with then uses microwave to connect to additional base stations) or as part of a 'daisy chain' (such as cabinets as part of a ring within the cable access network). We have treated these examples as a part of the access network and not inter-exchange backhaul connections.

3.13 Demand for inter-exchange connectivity comes from telecoms operators that need to carry aggregated traffic between BT exchanges to reach their own networks. Fixed broadband operators are particularly reliant on access to BT exchanges to be able to use BT’s wholesale access services. Competition in the CI Inter-exchange connectivity market arises primarily from the presence of rival infrastructure at these BT exchanges. This is covered in more detail in Section 7.

### Data centres

3.14 Data centres are secure buildings that house computing facilities for cloud-based services such as data storage and application hosting. Data centres also house substantial network nodes which can include core and backhaul node functionality.

3.15 Data centres can have multiple tenants and may be owned and operated by telecoms providers or run by third-party providers (in which case they are known as carrier neutral data centres).

3.16 Data centres can require high-capacity connections, often to a number of different telecoms providers, to support the large number of communications services and volumes of traffic.

### Business connectivity services and their main applications

3.17 This review focuses on high quality point-to-point business connectivity services. These services tend to be symmetric (i.e. the capacity is the same in both directions) and uncontended (i.e. the capacity is guaranteed and not subject to reduction by the presence of other communication services). These are different from other services such as consumer and business broadband connections which tend to be asymmetric and contended. In this consultation we refer to these high-quality business connectivity services as leased lines.<sup>26</sup>

3.18 Broadly, leased lines (LL in the diagram below) are used to provide:

- business end-to-end connectivity;
- business access connectivity to virtual private networks (VPNs), the internet and cloud computing;
- mobile network connectivity (often referred to as mobile backhaul); and
- broadband network connectivity (often referred to as fixed broadband backhaul).

### Business end-to-end connectivity

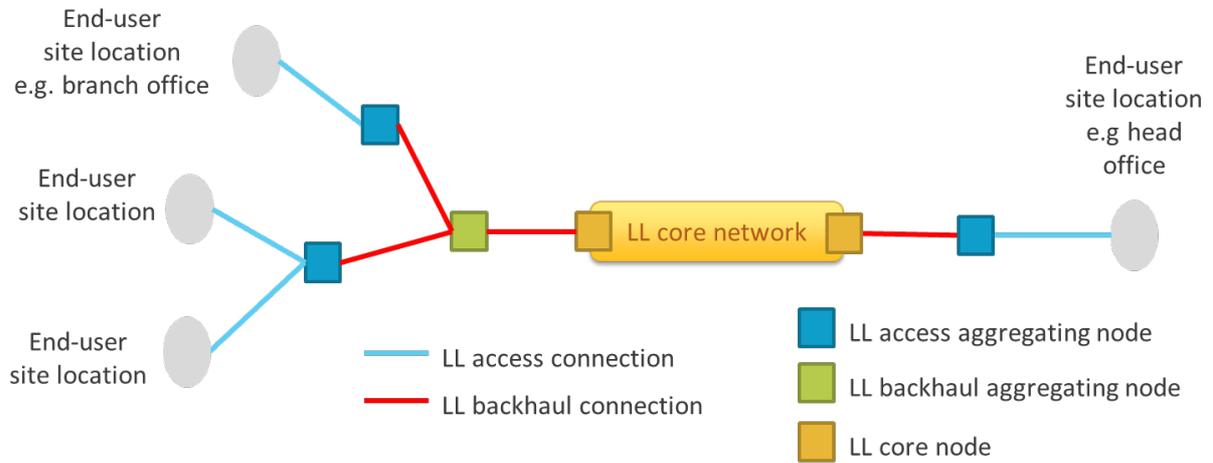
3.19 Traditionally, businesses have used leased lines to connect their sites, and sometimes to connect with other businesses. A typical end-to-end connectivity arrangement is illustrated

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<sup>26</sup> They are also known as private circuits.

in Figure 3.3. This model is becoming less common as it is superseded by VPNs<sup>27</sup>, including connectivity to internet-based services and outsourced cloud computing services.<sup>28</sup>

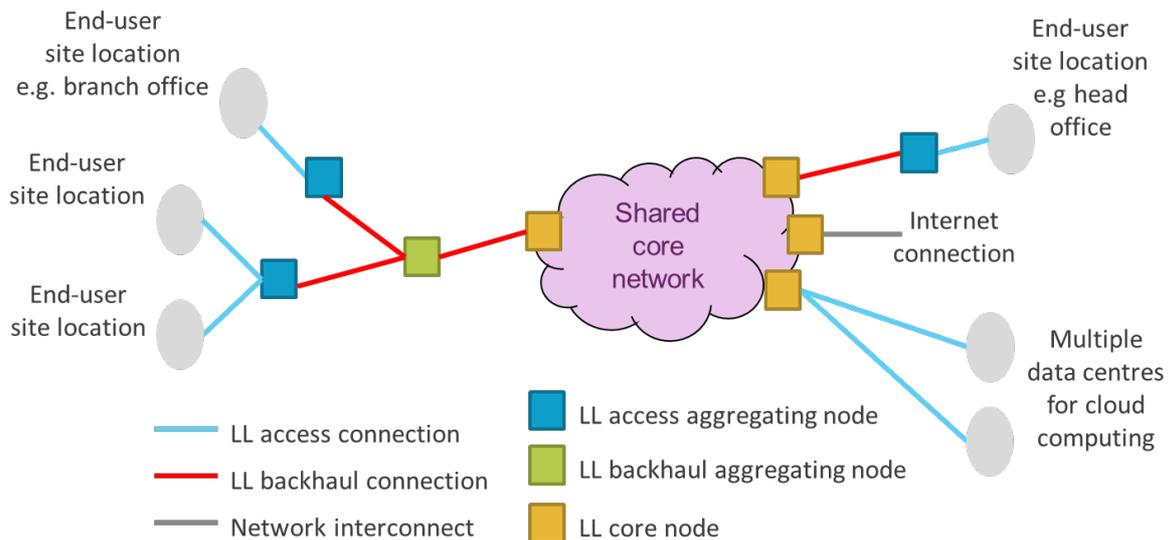
**Figure 3.3: Business end-to-end connectivity**



**Business access connectivity (VPN, internet and cloud computing access)**

3.20 Leased lines often provide the connections between business sites and network nodes that give access to services including VPNs, cloud computing, and the internet. Leased lines enable telecoms providers and system integrators to construct the networks that deliver

**Figure 3.4: Business access connectivity (VPN, internet & cloud computing)**



<sup>27</sup> Virtual private networks (VPNs) are networks that provide any-to-any connection between multiple sites (not just point-to-point). They are private to the customer, unlike the internet which is public. They are provided using communications equipment that is shared between a number of business customers and normally located in a telecoms provider’s or systems integrator’s premises or a data centre.

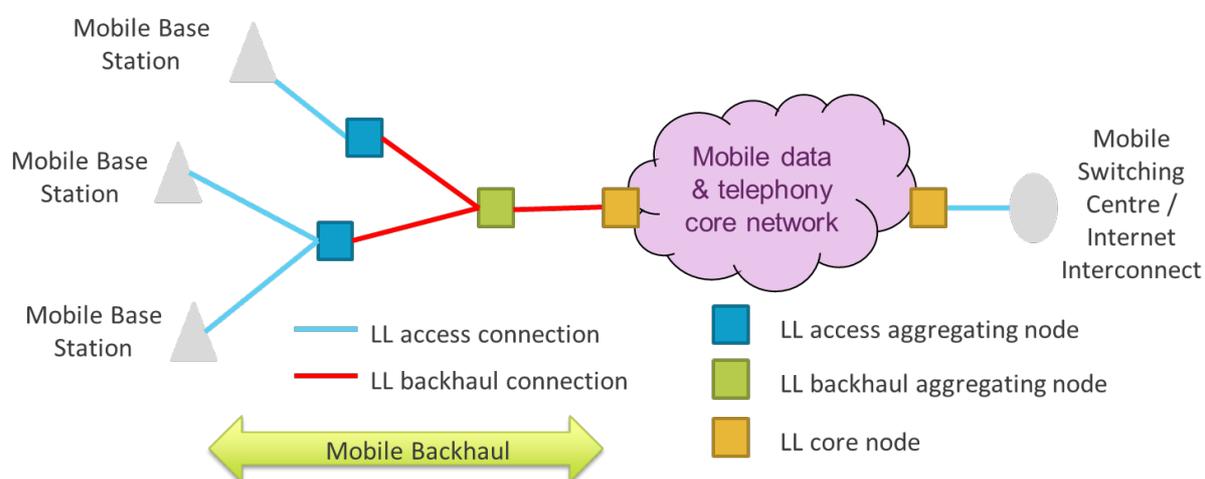
<sup>28</sup> Cloud computing is computing capacity, distributed across a number of data centres, that is connected by either an business VPN or networks provided by the data centre operators.

these services. VPNs allow the networks to be tailored to meet particular customers' needs which may vary in terms of capacity requirements, IT requirements, geographic locations, and number of sites. This is illustrated in Figure 3.4.

### Mobile network connectivity

3.21 Mobile network operators (MNOs) use leased lines to connect their base stations,<sup>29</sup> using access and backhaul connections, to their core network nodes. The term mobile backhaul is often used to refer to the combination of access and backhaul connections between the mobile base station and the mobile core node. MNOs may also use leased lines to provide connectivity between their core sites to construct the networks used to support mobile services including access to the internet and other networks. This is illustrated in Figure 3.5.

**Figure 3.5: Mobile network connectivity**



### Broadband network connectivity

3.22 Fixed broadband operators can build their own broadband networks using leased lines for backhaul and core connectivity, together with access connections owned and operated by BT. In this case, they will site their equipment to connect to BT's access network (i.e. their access aggregating node) at a BT local exchange. Alternatively, an operator may choose to build their own access connections (for example Virgin Media's network). A fuller description of a broadband network can be found in Ofcom's 2018 WBA Statement.<sup>30</sup>

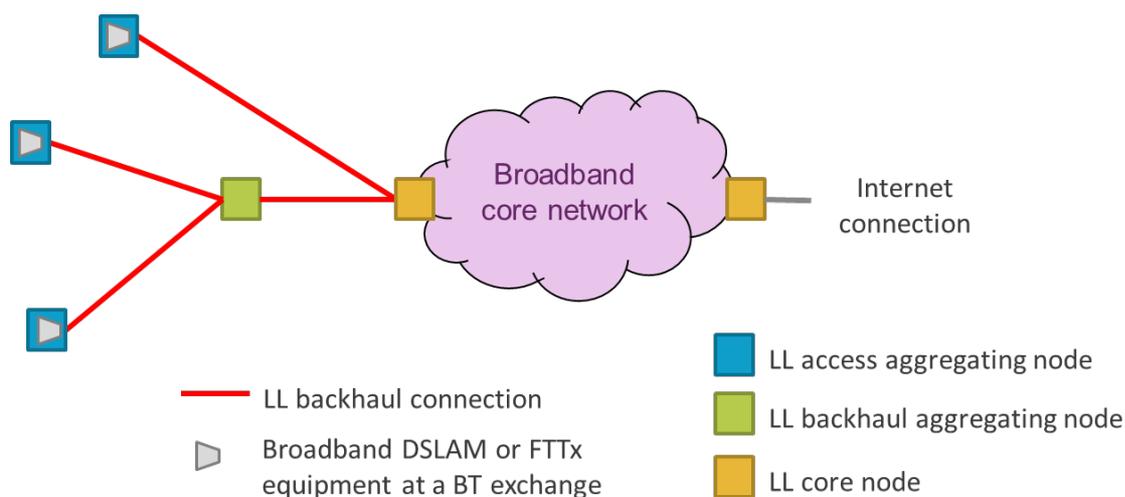
3.23 Fixed broadband operators use leased lines to connect from their access nodes within BT local exchanges to their backhaul and core network nodes. These network connections are referred to as fixed broadband backhaul. Fixed broadband operators will also connect to the internet at suitable locations to provide an end-to-end broadband service. This is illustrated in Figure 3.6 below.

<sup>29</sup> These are the radio masts that provide the communications between the mobile handset and the fixed mobile network.

<sup>30</sup> Ofcom, 2018. *Wholesale Broadband Access Market Review 2018 Final Statement*, pages 7-8.

[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0030/116994/statement-wba-review.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0030/116994/statement-wba-review.pdf).

Figure 3.6: Broadband network connectivity



### Leased line supply chain

3.24 To understand how businesses are using communications services, we commissioned research from Cartesian (2018 Cartesian report).<sup>31</sup> As part of the research, Cartesian provided an overview of the retail supply chain.<sup>32</sup> The 2018 Cartesian report identified several categories of telecoms providers that use leased lines to provide connectivity at the retail level:

- **Network operators** use their own networks to provide end-to-end network connectivity services to customers. BT, Vodafone, and Virgin Media provide these services using their own extensive networks which include access, aggregation and core. Some fixed broadband operators, such as Sky and TalkTalk, have significant backhaul and core infrastructure, but no access network. Other operators, such as Colt and CityFibre, have significant access networks in some areas, but less extensive backhaul and core infrastructure.
- **Network aggregators** buy services from network operators to offer their customers, typically value-added resellers, end-to-end to network connectivity.
- **Value added resellers** and systems integrators purchase network connectivity services from network operators or aggregators and resell them to end customers. These may be bundled with other computing services such as data storage and applications. The services are tailored to the customer's needs and may range from just connectivity through to complete managed IT solutions.

### Types of leased lines

3.25 Leased lines provide connections between network sites containing network nodes, and from an access node to an end-user site (such as a business site or mobile base station).

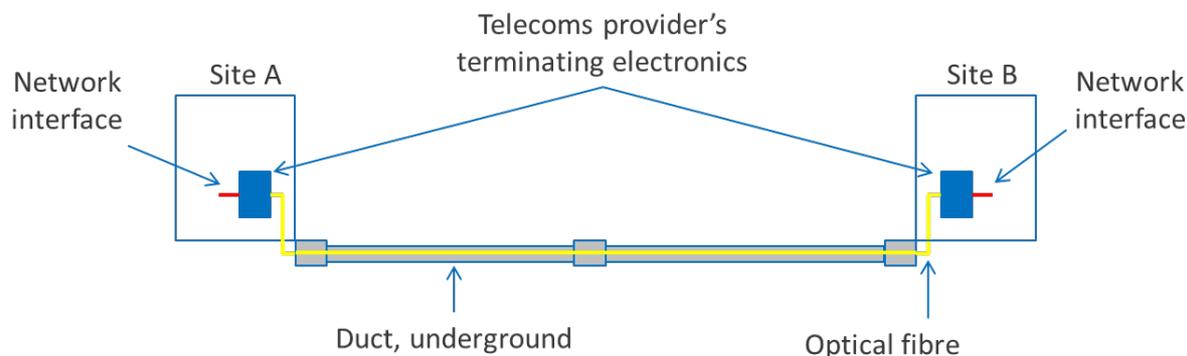
<sup>31</sup> Ofcom, 2018. *Cartesian Business Connectivity Market Assessment*.

[https://www.ofcom.org.uk/data/assets/pdf\\_file/0009/113112/cartesian-business-connectivity-market-assessment.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0009/113112/cartesian-business-connectivity-market-assessment.pdf).

<sup>32</sup> 2018 Cartesian report, pages 14-15.

These leased lines are generally made using physical point-to-point connections provided over fibre (or less commonly copper). These can be buried directly in the ground, carried overhead, or run as a multi-strand cable inside a duct as illustrated in Figure 3.7.

**Figure 3.7: Structure of a typical leased line<sup>33</sup>**



- 3.26 These circuits can be provided with or without active electronics. A circuit without active electronics is often referred to as a passive connection (such as dark fibre, which we discuss below).
- 3.27 The different elements making up the connectivity service provided to the end customer may be supplied by different telecoms providers. One may provide the duct, another may provide the fibre and a third may add the electronics to light the fibre. Vertically integrated operators may provide all three layers.
- 3.28 In the following paragraphs we describe the following types of leased lines<sup>34</sup>:
- Ethernet leased lines;
  - wavelength division multiplex (WDM) leased lines;
  - dark fibre (also known as optical fibre);
  - Ethernet in the first mile (EFM) leased lines; and
  - traditional interface (TI) leased lines.

### Ethernet leased lines

- 3.29 Contemporary Interface (CI) leased lines are generally based on Ethernet<sup>35</sup> standards and are specified by bandwidth (e.g. 100 Mbit/s, 1 Gbit/s, or 10 Gbit/s). Ethernet leased lines are typically delivered over fibre, reaching 70km or more in length over a single fibre. Changing the bandwidth of a leased line involves either changing or reconfiguring the electronics at both ends.
- 3.30 Openreach currently offers two Ethernet-based product sets<sup>36</sup>:

<sup>33</sup> The route between two points in a network can be referred to interchangeably as circuits or connections.

<sup>34</sup> We describe Openreach products, where available, as a useful reference point. Similar products may be available from other telecoms providers.

<sup>35</sup> Ethernet as a technology is described by a set of standards (e.g. 802.3) organised by the Institute of Electrical and Electronics Engineers (IEEE). More information can be found at the IEEE website <http://standards.ieee.org/index.html>.

<sup>36</sup> EAD and EBD replaced wholesale extension services (WES) (which is used for access), wholesale end-to-end services (WEES) and backhaul extension services (BES).

- Ethernet Access Direct (EAD) which supports Ethernet connections from 10 Mbit/s to 10 Gbit/s; and
- Ethernet Backhaul Direct (EBD) which supports Ethernet connections, mainly at 1 Gbit/s and 10 Gbit/s, and is available between BT's larger exchanges.

### Wavelength division multiplex (WDM) leased lines

- 3.31 WDM is a technology that can support multiple wavelengths (from 16 for a simple system and potentially up to 320) over one or two fibres, with one circuit per wavelength. The bandwidth for each wavelength is typically 10 Gbit/s, but can go as high as 400 Gbit/s. Once the first circuit is installed, additional circuits can be added quickly without the need to add more fibres. The high bandwidths and scalability of WDM leased lines make them particularly suited for high capacity routes, for example, between core nodes, to data centres, and for some backhaul connections.
- 3.32 Openreach offers two main product families based on WDM:
- Optical Spectrum Access (OSA) which can operate up to 35km with a 70km extended reach variant; and
  - OSA Filter Connect, which allows customers, apart from the first WDM circuit, to supply their own electronics to light additional wavelengths. The first WDM circuit uses Openreach electronics with a standard CI interface (e.g. Ethernet) to provide end-to-end monitoring. There is also an Ethernet only variant<sup>37</sup> (10 Gbit/s or 20 Gbit/s) suitable for installation in outside cabinets.

### Dark fibre

- 3.33 Dark fibre is a passive optical fibre connection between two sites (and is so called because there is no equipment at either end to light the fibre). This is in contrast to an active connection which includes electronics at either end of the fibre connection.
- 3.34 Dark fibre providers install and sell fibre to connect between two sites, with the purchaser of the dark fibre adding the active electronics to provide point-to-point business connectivity services such as Ethernet or WDM.
- 3.35 Openreach does not currently sell dark fibre for either access or backhaul.

### EFM

- 3.36 EFM is based on technology standards that allow telecoms providers to run Ethernet over a copper pair or multiple bonded pairs to connect to a customer. In the UK, telecoms providers that use EFM most commonly lease BT's copper local loops to connect customer premises to the nearest BT local serving exchange. They connect the services carried by EFM to their backhaul and core transmission networks to provide leased line services or other services, e.g. VPNs, internet access and cloud computing.

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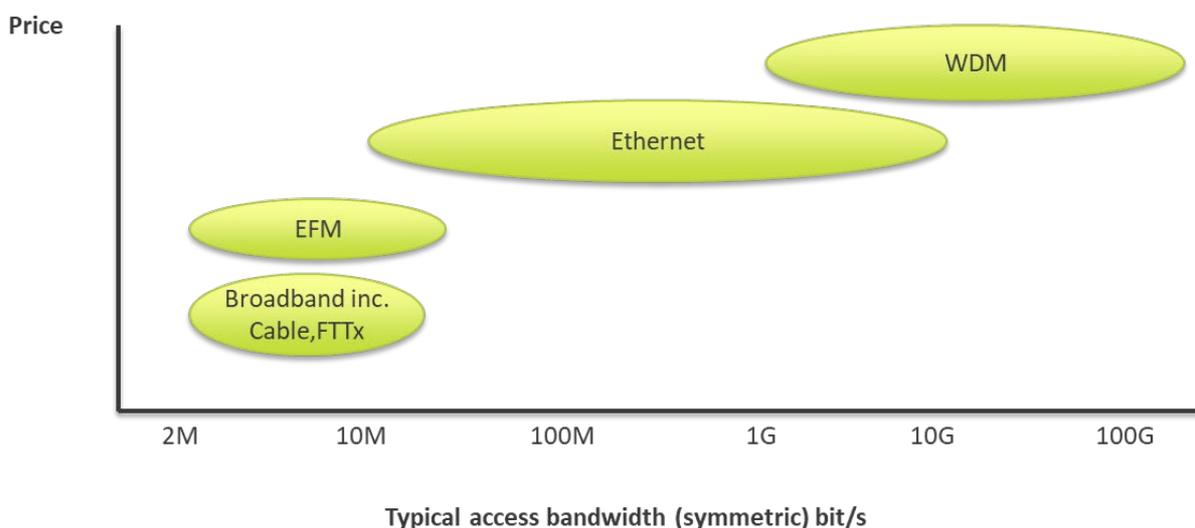
<sup>37</sup> Openreach published a product briefing on 20 June 2018.

- 3.37 The copper pair provides dedicated symmetric connectivity to the customer with an Ethernet interface. However, the use of copper for the access connection means that the EFM connection faces greater distance and bandwidth limitations than fibre. The signal diminishes the further the customer is from the exchange, which in turn affects the speed of a connection that can reliably be offered. Speeds are typically 20-30 Mbit/s when connected to six copper pairs.
- 3.38 The availability of EFM is typically limited to larger exchanges where business site density is higher. They cannot be used for inter-exchange connections due to low or non-availability of copper pairs on these routes and because of the long distances. In general, EFM has superseded legacy SDSL<sup>38</sup> services which operate over a single copper pair.

**TI leased lines**

- 3.39 TI leased lines use legacy technology to provide analogue and digital services. In the past these were the most common types of leased line in use in the UK, but their volume is now in sustained decline. There are two broad types of TI connection:
- Analogue interface leased lines: These are commonly used for voice transmission, for example between business sites. They are also used for low bandwidth data transmission. For access, these are nearly always delivered over copper.
  - Digital interface leased lines based on legacy TDM (time division multiplexing) technology. BT no longer supplies TI connections below 2 Mbit/s. The most common speed of TI access connections is 2 Mbit/s and these are typically delivered over copper. For inter-exchange connections, which are typically delivered over fibre, common variants are 34 Mbit/s, 155 Mbit/s, and 622 Mbit/s.

**Figure 3.8: Stylised summary of the main CI service types by bandwidth<sup>39</sup> and price**



<sup>38</sup> SDSL, or symmetric digital subscriber line, is a symmetric version of a residential broadband service, usually over a single copper pair.

<sup>39</sup> For broadband, the diagram uses the upstream speed as a proxy for the maximum symmetric speed available e.g. a 20 Mbit/s upstream, 80 Mbit/s downstream product could be used as the basis for a 20 Mbit/s symmetric product.

### Different products and services suited to different applications

3.40 Figure 3.8 provides a stylised depiction of the different services comparing relative price to the range of symmetric bandwidths a product can typically support.

3.41 Leased lines are significantly more expensive than asymmetric copper or fibre based broadband services. The cheapest symmetric Ethernet access leased line services are based on EFM.

### The cost of providing a leased line

3.42 To provide active or passive leased lines, the telecoms provider needs a connection to the customer's premises. For an active connection, a telecoms provider also needs to provide electronics to connect to each end of the fibre (see Figure 3.7 previously).

**Table 3.9: Costs of providing leased line services at different speeds on selected route distances**

Cost Component (£)	Ethernet 1 Gbit/s		Ethernet 10 Gbit/s	
	100m	1Km	100m	1Km
<b>Electronic equipment and installation</b> <sup>40</sup>	285	285	[Redacted] 795 to 1,193	[Redacted] 795 to 1,193
<b>Physical infrastructure</b> <sup>41</sup>	9.6K	84K	9.6K	84K
<b>Total cost</b>	9.9K	84.2K	[Redacted] 10.4 to 10.8	[Redacted] 84.7 to 85.2
<b>Proportion of infrastructure cost %</b>	97.1%	99.7%	[Redacted] 88.9% to 92.3%	[Redacted] 98.6% to 99.1%

Source: Ofcom analysis of publicly available data and responses to s.135 notices.

3.43 The physical infrastructure (i.e. the duct and optical fibre) accounts for a large proportion of the cost of providing a leased line: our estimates suggest more than 90% (see Table 3.9). Once physical infrastructure is built its costs are sunk, largely fixed, and do not vary depending on the bandwidth of the connection.

3.44 Table 3.9 shows how costs vary by the type of leased line service and by the connection length. It shows our estimates of the costs to supply leased lines for two different services (Ethernet 1 Gbit/s and 10 Gbit/s) and for two different connection lengths (100m and 1km). These costs are indicative of costs in an urban area. Costs in a rural area would be much less where per metre costs of digging are lower. These costs also assume that only

<sup>40</sup> Ethernet electronics equipment and installation is based on Openreach's annual depreciation of the unit FAC for Ethernet Electronics Capital cost for EAD LA 1 Gbit/s and EAD 10 Gbit/s services and it includes the cost of the equipment and its installation at both ends of a connection.

<sup>41</sup> Physical infrastructure costs are based on Openreach's Excess Construction Charges (survey, blown fibre tubing, blown fibre, duct under a footway, duct under a carriageway, new footway box, and breaking/drilling through external wall).

one connection is supplied, whereas operators would typically seek to supply more than one customer/leased line, reducing the cost per connection. Nonetheless, the table shows that the costs of the physical infrastructure are high as a proportion of the overall cost.

3.45 The cost of the physical infrastructure increases with the length of the connection but is essentially independent of the type of service. On the other hand, the cost of electronic equipment can depend on the type of service.

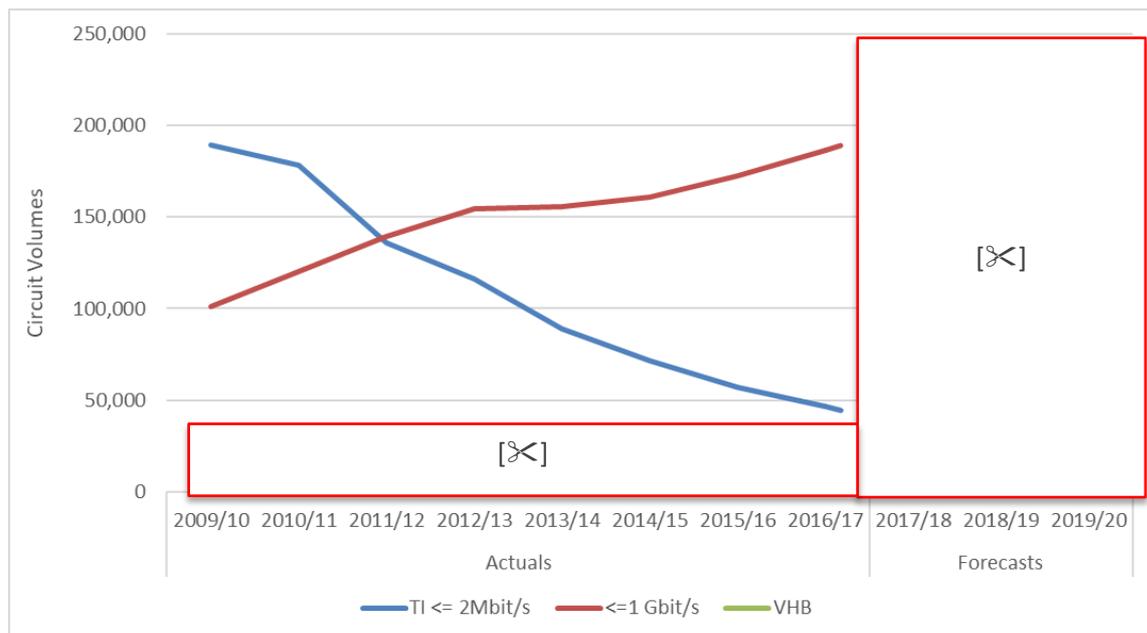
3.46 Table 3.9 also shows that:

- the cost of extending the geographic reach of the network is significant even at short distances and increases with the length of the connection. For example, it costs around £10K to extend the network for 100m, which goes up to £85K for 1km; and
- the cost differential for providing different services is relatively low.

## Market trends, outlook, and approach

### Volume and bandwidth trends

Figure 3.10: Growth in TI and CI leased line services



Source: Actuals based on Ofcom analysis of BT’s RFS volumes for rental TI and CI services at 1 Gbit/s and below.<sup>42</sup> Forecasts based on Ofcom analysis of Openreach forecasts for rental CI services and BT forecasts for rental TI services in response to Q)11 of the 1<sup>st</sup> LLCC s.135 notice dated 2 March 2018.

3.47 Ethernet services account for the majority of installed circuits in the UK. The number of TI circuits has declined rapidly, as shown in Figure 3.10, and is expected to continue to

<sup>42</sup> The TI circuit end volumes reported in BT’s Regulatory Financial Statements (RFS) have been divided by two to provide an estimate for an end-to-end circuit to allow a comparison with CI circuits which are reported as an end-to-end circuit. BT, 2018. *Regulatory Financial Statements 2018*. <https://www.btplc.com/Thegroup/Policyandregulation/Governance/Financialstatements/2018/RegulatoryFinancialStatements2018.pdf> [accessed 30 October 2018].

decline over the review period.

- 3.48 Total demand for Ethernet and WDM services has increased since the last review and demand for these products is forecast to increase over this period.
- 3.49 Demand for 10 Mbit/s connections has declined as the product becomes redundant and bandwidth requirements increase. BT prices 10 Mbit/s almost identically to 100 Mbit/s services, and provides it using the same equipment as a 100 Mbit/s service.<sup>43</sup> 100 Mbit/s and to some extent 1 Gbit/s are viewed as entry level speeds.
- 3.50 Very high bandwidth circuits (VHB) i.e. circuits with a bandwidth over 1 Gbit/s, make up a relatively small proportion of leased lines compared to circuits at 1 Gbit/s and below, but forecasts indicate the use of VHB services is expected to increase over time.

## Market outlook

- 3.51 Demand for online services, mobile data and business demand for increased productivity and new applications have driven an increase in the capacity of UK networks, growing by around 20%-25% over recent years.<sup>44</sup> This is within the range of a 2017 industry forecast by Cisco which indicated an increase in global IP traffic by a factor of three between 2016 and 2021, at a rate of around 20% per annum.<sup>45</sup>
- 3.52 For the 2018 Cartesian report, which considered how UK large businesses (also referred to as enterprises by Cartesian) are using communication services, Cartesian asked businesses how they saw their needs evolving over the next five years. Cartesian also interviewed some telecoms providers and mobile network operators.
- 3.53 The main trends by type of customer are summarised below:
- **Business customers:** Fixed connectivity is regarded as a critical communication service for business. Businesses think network resilience is increasingly important. Businesses expect their demand for data to increase over the next five years, driven by, for example, the move of applications to the cloud and an increased use of video.
  - **Mobile network operators:** The amount of mobile data we use is growing, increasing by almost 50% in 2017.<sup>46</sup> As this trend continues, demand for higher bandwidth backhaul is expected to grow. 5G is the next generation of mobile technology and was the overarching focus of the interviews Cartesian conducted with mobile operators. It is expected to deliver faster and better mobile broadband, and to enable more revolutionary uses in sectors such as manufacturing, transport and healthcare. Mobile network operators expect to upgrade bandwidth at many existing sites over the next

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<sup>43</sup> The electronics for 10 Mbit/s and 100 Mbit/s are the same, using 'autosensing' to select the correct transmission speed.

<sup>44</sup> Ofcom estimate based on 2017 leased line circuit volumes, circuit bandwidths, and historical circuit inventory volumes.

<sup>45</sup> Cisco, June 2017. *The Zettabyte Era: Trends and Analysis*. <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/vni-hyperconnectivity-wp.html> [accessed 30 October 2018].

<sup>46</sup> Ofcom, August 2018. *Communications Market Review 2018*. <https://www.ofcom.org.uk/research-and-data/multi-sector-research/cmr/cmr-2018>.

five years to meet the increase in demand for mobile data on 4G and 5G networks. Over the next five years they may also start to increase the density of their networks, introducing small cells with the rollout of 5G, with trials of 5G technology already planned or underway.<sup>47</sup> New mobile base station architecture could also increase demand for leased lines.

- **Telecoms providers, including fixed broadband providers:** The increase in data demand from end-users such as businesses, mobile users and residential broadband means that communication service providers forecast their bandwidth requirements for backhaul and other inter-exchange circuits will also increase. An increase in demand for superfast broadband from business and residential customers is likely to lead to a concentration of demand for higher bandwidth leased lines from the c.1150 exchanges that are capable of supplying superfast broadband.

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<sup>47</sup> ISPreview.co.uk, 2018. *EE UK Switches On First Live Trial of 5G Mobile Tech in Canary Wharf*. [www.ispreview.co.uk/..first-live-trial-of-5g-mobile](http://www.ispreview.co.uk/..first-live-trial-of-5g-mobile) [accessed 30 October 2018].

## 4. CI Access: product market definition

- 4.1 In Section 3, we explained the distinction between access and inter-exchange services. In this section we set out our proposed product market definition for CI Access services. Our analysis of the market for CI Inter-exchange connectivity is set out in Section 7.
- 4.2 Our provisional conclusions can be summarised as follows:
- we propose to define a single market for CI Access services at all bandwidths, which includes all wholesale fibre-based Ethernet and WDM services;<sup>48</sup>
  - we propose to include dark fibre used to supply or self-supply CI Access services in the product market; and
  - we propose to exclude business-grade connectivity services provided over EFM, as well as symmetric and asymmetric broadband, from the product market.
- 4.3 Our preliminary findings are primarily underpinned by our analysis of supply-side substitution. Openreach offers leased lines at different bandwidths. The physical product is similar in all cases: a fibre point-to-point line, which differs only in the equipment on either end. Some types of equipment can be used to supply a range of bandwidths, though Openreach moderates the available bandwidth which differentiates the products it offers and allows it to set different price points.
- 4.4 We take into account the ability of providers to switch seamlessly between bandwidths once they connect a customer to their network with a fibre point-to-point connection and find a single product market covering all bandwidths.
- 4.5 In reaching our proposals, we have considered whether leased lines purchased by mobile network operators (for the purposes of providing mobile backhaul) should be included in the same market as enterprise access circuits. The key question is whether the supply of circuits to mobile operators differs sufficiently from supply to enterprise customers to merit treatment as a separate market. Our analysis is set out in Annex 9 and indicates that, although there are some differences between purchasers of mobile backhaul and enterprise customers, in both cases, competition is determined by the proximity of rival networks to the customer site. On that basis, competitive conditions at particular locations are largely the same whether the end customer is a mobile operator or an enterprise customer. We therefore propose not to define a separate market for this customer group.
- 4.6 The remainder of this section is set out as follows:
- our approach to product market definition;
  - our assessment of demand-side substitution;
  - our assessment of supply-side substitution; and
  - our provisional conclusion on product market definition for CI Access services.

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<sup>48</sup> We set out a description of these services in Section 3.

## Our approach

### SSNIP test as our conceptual framework

- 4.7 The main purpose of the product market definition is to identify the competitive constraints on each of the CI Access services provided by BT over the Openreach network. In the context of CI Access services, the focus is on whether the supply of a circuit at one bandwidth is a competitive constraint on the supply of another circuit at a different bandwidth, such that they should be considered as part of the same relevant market when assessing whether BT has SMP.
- 4.8 The EC SMP Guidelines identify two main sources of competitive constraints: demand and supply-side substitution:
- “The extent to which the supply of a product or the provision of a service in a given geographical area constitutes a relevant market depends on the existence of competitive constraints on the price-setting behaviour of the service provider(s) concerned. There are two main competitive constraints to consider in assessing the behaviour of undertakings in the market; (i) demand-side; and (ii) supply-side substitution. A third source of competitive constraint on an operator's behaviour — to be considered not at the stage of market definition but when assessing whether a market is effectively competitive within the meaning of Directive 2002/21/EC — is the existence of potential competition.”<sup>49</sup>
- 4.9 The small but significant non-transitory increase in price (SSNIP) test is a well-established approach for assessing these constraints. It starts by selecting a suitable focal product and asks whether a hypothetical monopolist would be able to profitably impose a SSNIP above the competitive price level on that focal product. From the demand side, the question is whether the number of customers switching to an alternative product would be enough to render the SSNIP unprofitable, in which case the relevant market should be expanded to include the candidate substitute. From the supply side, the question is whether alternative suppliers would switch production of a good (other than the focal product) to produce the focal product in the short-term and without incurring significant additional costs, and render the SSNIP unprofitable.<sup>50</sup>
- 4.10 This approach is consistent with the EC SMP Guidelines which state that:

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<sup>49</sup> EC, 2018. *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), paragraph 27.

[http://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=51836](http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=51836) [accessed 30 October 2018].

<sup>50</sup> Where there is more than one candidate substitute, the process is more complex. The market definition exercise would start in this case with the closest candidate substitute and if the SSNIP test suggests that substitution to this substitute would render the SSNIP unprofitable the focal product would be expanded to include the initial focal product and the candidate substitute. A second SSNIP test would then be applied with the new focal product and the next closest candidate substitute. This would be done until the set of products is such that a SSNIP would become profitable.

- “One possible way of assessing the existence of any demand and supply-side substitution is to apply the so-called ‘hypothetical monopolist’ or SSNIP test. Under this test, an NRA should ask what would happen if there were a small but significant and non-transitory increase in the price of a given product or service, assuming that the prices of all other products or services remain constant [...]. While the significance of a relative price increase will depend on each individual case NRAs should consider customer (consumer or undertaking) reactions to a small but non-transitory price increase of between 5 to 10%. Customer responses will help determine whether substitutable products exist and, if so, where the boundaries of the relevant product market should be delineated.”<sup>51</sup>

### Supply-side substitution as the primary source of competitive constraint

- 4.11 Competition in the supply of CI Access services arises from the potential for rival suppliers to extend their fibre networks to BT’s customers. Where they are already connected to the customer, rival suppliers can offer the full suite of bandwidths relatively quickly and at little incremental cost, thus constraining BT’s CI Access services from the supply side.
- 4.12 However, the majority of customers are not connected to multiple networks. Where this is the case, the competitive constraint from supply-side substitution will depend on the proximity of nearby rival networks. This is because a supplier with a network that is closer to the customer has a significant cost advantage over one that is further away. Customers may also face greater inconvenience if choosing to switch to suppliers located further away, due to the duration and uncertainty of the time taken for the supplier to extend its network.
- 4.13 Our analysis therefore considers whether the ability and incentive for operators to build out from their network to connect a customer in response to a SSNIP differs substantially between different CI Access services, such that the nature of competition (on the supply side) also differs and hence points towards narrower markets.

### Services in scope

- 4.14 The starting point of our market definition exercise is wholesale fibre leased lines supplied by BT over the Openreach network. These services include fibre-based Ethernet and WDM services of different bandwidths used to connect to customer sites. We refer to these services as CI Access services.
- 4.15 We have examined whether CI Access services of different bandwidths are sufficiently close substitutes to one another such that they should be considered in the same product market. In addition, we have investigated whether other access services, such as dark fibre,

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<sup>51</sup> EC SMP Guidelines, paragraph 29.

asymmetric broadband and EFM, should be considered in the same product market as CI Access services.<sup>52</sup>

- 4.16 We set out our analysis of substitution to leased lines provided over microwave links in Annex 9.

## Relationship between wholesale and retail markets

- 4.17 Although this is a review of wholesale services, the relationship between wholesale and retail markets is important in our assessment. Demand for wholesale products derives from demand for retail services, so demand-side substitution between wholesale products will partly arise from indirect constraints from retail markets.<sup>53</sup>
- 4.18 It is not necessary to formally define retail markets to define wholesale markets, provided that wholesale market definition takes into account any indirect constraints that exist. For instance, when identifying the products to which wholesale customers would move in response to a SSNIP, we have taken into account the bandwidth needs of customers at the retail level, rather than the bandwidth of the wholesale circuits that are used to satisfy such bandwidth needs.
- 4.19 Our proposed approach to retail and wholesale market definition is the same as in the 2016 BCMR and is consistent with the relevant EC Guidelines.

## Modified Greenfield approach

- 4.20 When carrying out our market definition analysis we have applied the Modified Greenfield Approach. The analysis below is therefore conducted in relation to a hypothetical scenario in which there are no *ex ante* SMP remedies in the reference market(s), but *ex ante* SMP remedies in other markets continue to apply. For example, we assume that remedies imposed in the wholesale local access (WLA) market apply and that therefore BT is required to provide LLU, VULA and PIA.<sup>54</sup>

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<sup>52</sup> Note that in the 2016 BCMR we excluded leased lines used for specialist applications such as CCTV, Broadcast and Street Access from the CI market. We remain of the view that these circuits are not viable substitutes for fibre leased lines, as they either use a different interface to traditional CI Access services or are priced at a significant premium. We have thus taken the initial view of excluding these services from the proposed product market. These services account for a minimal number of circuits and so do not influence our SMP findings.

<sup>53</sup> Indirect constraints arise because a wholesale price increase is likely to be passed on to the retail level, which may result in end customers switching to goods which do not require the wholesale input. If such retail substitution would be sufficient to limit the ability of a wholesale operator to profitably impose a SSNIP, then an indirect constraint exists. Such indirect constraints might lead to wholesale products being included in the same relevant market even if those products do not constrain each other directly at the wholesale level.

<sup>54</sup> One practical implication of this approach is that EFM-based services can be included in our assessment, even though telecoms providers require access to BT's regulated WLA products to be able to supply such services.

## Demand-side substitution

- 4.21 Demand-side substitution arises when customers switch to alternative products in response to changes in their relative prices. The analysis of demand-side substitution considers how this switching would affect the profitability of a hypothetical monopolist of a certain product (i.e. the focal product) attempting a SSNIP.
- 4.22 This analysis implicitly assumes that the alternative product acts as a constraint on the supply of the focal product. This is not always the case for CI Access services, where the main demand substitute for an Openreach leased line is typically another Openreach leased line of a different bandwidth. Openreach sets charges recognising this to maximise profits across bandwidths, taking into account that in the event of a price increase for a given bandwidth, many of the switching customers would switch to another Openreach leased line, such that Openreach would ‘recapture’ many of the diverted sales.<sup>55</sup> This is in contrast to instances where the demand-side substitute is offered by rivals and the incumbent firm loses the diverted sales.
- 4.23 In conducting a SSNIP test, there is the additional complication that prices for CI Access services of 1 Gbit/s and below are charge controlled while those for services over 1 Gbit/s (which we refer to as very high bandwidth or VHB services) are not. As noted in Section 6 and Annex 14 on VHB, the evidence indicates that BT would have market power on VHB services considered on a standalone basis, so prices on these services may be distorted. This is supported by the high profit margin BT earns on VHB services, for which we estimate BT currently charges significantly above fully allocated cost (FAC), see Figure A7.2.
- 4.24 The EC SMP Guidelines state that: “The SSNIP test can, however, not be applied, if the price level or other market parameters are not at competitive level, as such analysis would be liable to the so-called cellophane fallacy. NRAs faced with such difficulties could rely on other criteria for assessing the substitution, such as functionality of service, technical characteristics etc.”.<sup>56</sup>
- 4.25 Therefore, existing price differentials between bandwidths may not be a reflection of demand-side constraints differing across bandwidths. Moreover, the SSNIP test may not capture the full extent of these constraints. However, we consider that demand-side

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<sup>55</sup> Openreach’s internal documents submitted in response to question 4 of the 8<sup>th</sup> s.135 notice (dated 20 April 2018) suggest that it seeks to maximise returns across its portfolio of products (see document entitled “New pricing and product launches for VHB portfolio”, pages 3 and 19-20, and slide deck entitled “Product Proposals : Ethernet & Optical Response to Dark Fibre”, slide 7). This implies that Openreach takes into account the impact of price changes on bandwidth substitution. The closest substitute for an Openreach VHB service will often be an Openreach service at a lower bandwidth, such that customers who choose not to purchase an Openreach VHB service due to high charges may instead purchase a different Openreach service. As the sale is ‘recaptured’ by Openreach, high charges for VHB services may have maximised profits across the portfolio with little relationship to underlying costs. While this price discrimination may be profit-maximising, it means that caution should be applied when drawing conclusions on market definition based on prevailing charges.

<sup>56</sup> Explanatory note to the EC SMP Guidelines (SWD(2018) 124), page 11, [http://ec.europa.eu/newsroom/dae/document.cfm?doc\\_id=51927](http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=51927) [accessed 30 October 2018].

substitution is important for assessing the constraints that alternative connectivity services such as EFM and asymmetric broadband may impose on CI Access services. Consequently, we set out a demand-side substitution analysis below, while a more detailed analysis is presented in Annex 8.

## Our approach to demand-side substitution

4.26 We have assessed demand-side substitution by applying a SSNIP test to the following focal products which account for 99%<sup>57</sup> of Openreach’s leased lines, in terms of volume:

- 10 Mbit/s;
- 100 Mbit/s;
- 1 Gbit/s; and
- 10 Gbit/s.

4.27 For each of these focal products we have assessed the likely amount of switching (in response to a SSNIP) to a range of candidate substitutes and have ascertained whether this would exceed the critical loss that would render a SSNIP unprofitable. Table 4.1 shows the critical loss thresholds we have used for each focal product which are underpinned by the evidence regarding Openreach margins presented in Annex 8. The switching threshold refers to the amount of volume that would need to switch from the focal product in the event of a 10% SSNIP for the price rise to be unprofitable. This threshold ranges from just [Redacted] for the high margin 10 Gbit/s product, to [Redacted]% for 10-100 Mbit/s circuits.

**Table 4.1: Critical loss threshold**

Focal product	Proportion of customers switching
10 Mbit/s	[Redacted]%
100 Mbit/s	[Redacted]%
1 Gbit/s	[Redacted]%
10 Gbit/s	[Redacted]%

Source: Ofcom analysis based on Openreach data (see Annex 8).

4.28 In assessing the likely amount of switching we have considered what the competitive price benchmark should be for each focal product. As prices for lower bandwidths are regulated, we consider that they represent a reasonable proxy for “the competitive level”.<sup>58</sup> The EC SMP Guidelines state that “where a product or service is already offered at a regulated,

<sup>57</sup> Openreach response to question A of the 1<sup>st</sup> s.135 notice dated 18 January 2018.

<sup>58</sup> We acknowledge that lower bandwidth CI services have been regulated as part of a basket and therefore BT has some flexibility to depart from costs for some services within the basket. However, we consider that this flexibility is limited and therefore, we are of the view, that current prices are a reasonable proxy for “the competitive level”.

cost-based price, a regulated price will be assumed to be set at competitive levels and should be taken as the starting point for the hypothetical monopolist test.”<sup>59</sup>

- 4.29 For 10 Gbit/s services, which are not currently subject to price controls, it is not possible to directly identify competitive prices, but we consider these are likely to be below current price levels. We take this into account in our assessment below.

## SSNIP analysis

- 4.30 For most leased lines, the main demand-side substitute is another leased line of a different bandwidth. The bandwidth differential between these services tends to be substantial as leased lines are typically offered in bandwidth differential multiples of 10. However, the price differential between these services is not always significant (and in some cases equal to zero), particularly for bandwidths of 1 Gbit/s and below. Consequently, a 10% price rise could sometimes mean that customers would save costs, and get the benefit of a substantial bandwidth boost, by switching to a higher bandwidth service.
- 4.31 Our analysis therefore indicates that for low bandwidth services of 1 Gbit/s and below, where charges are fairly constant across bandwidths (see Figure A7.2), a SSNIP is likely to be defeated by substitution to the next higher bandwidth service, suggesting there is a wider market encompassing bandwidths 1 Gbit/s and below.
- 4.32 This may not be the case for substitution between 1 Gbit/s and 10 Gbit/s where price differentials remain high, even after a 10% price rise on 1 Gbit/s. This price differential suggests a bandwidth break between 1 Gbit/s and 10 Gbit/s, though this may be influenced by current high VHB prices. In any case, even if price differentials were to reflect cost differentials in a competitive market, we consider that existing cost differentials between 1 Gbit/s and 10 Gbit/s (see Annex 7) are such that substitution to 10 Gbit/s may not be sufficient to defeat a SSNIP on 1 Gbit/s. We therefore find the evidence ambiguous with respect to the presence of a separate VHB market from the demand side.
- 4.33 Our analysis also indicates that EFM<sup>60</sup> and asymmetric broadband services are unlikely to sufficiently constrain CI Access services to consider them in the same product market, even when considering substitution from 100 Mbit/s which is arguably a closer substitute to EFM and asymmetric broadband than higher bandwidths. EFM services are largely considered legacy services and telecoms providers are expecting to replace them with FTTC/FTTP based services in the longer term<sup>61</sup>.

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<sup>59</sup> EC SMP Guidelines, paragraph 31.

<sup>60</sup> Our analysis of EFM substitution also applies to substitution to business grade connectivity provided over symmetric broadband services using SDSL technologies, which is the legacy version of EFM. We have not referred to these technologies explicitly in our analysis as these have been largely superseded by EFM.

<sup>61</sup> [REDACTED] response to Question 1a) of the 6<sup>th</sup> s.135 notice dated 27 April 2018; [REDACTED] response to Question 1 of the 6<sup>th</sup> s.135 notice dated 20 April 2018, [REDACTED]; [REDACTED] response to Question 5 of the 6<sup>th</sup> s.135 notice dated 20 April 2018; and [REDACTED] response to Question 1b of the 6<sup>th</sup> s.135 notice dated 20 April 2018.

- 4.34 In addition, we consider that asymmetric broadband remains a poor substitute for CI Access services mainly due to its lower bandwidth (up to 20 Mbit/s) and inferior quality in terms of latency, contention and service reliability. This is consistent with the results from the 2018 Cartesian report indicating that businesses perceive “copper-based circuits (EFM or broadband) [...] to be less reliable” than fibre leased lines, as well as with Openreach’s own 2015 migration analysis,<sup>62</sup> suggesting that a small proportion ([Redacted]%) of EAD leased lines which have been ceased and identified as possible migrations have moved to asymmetric broadband.<sup>63</sup> While ongoing and future FTTP deployments will narrow the speed and quality gap between asymmetric broadband and CI Access services, FTTP upload speeds are expected to fall short of 100 Mbit/s and our engagement with telecoms providers suggest that FTTP rollout will have little impact on the demand for leased lines over the course of this market review period.<sup>64</sup>
- 4.35 We have also assessed whether dark fibre is a close demand-side substitute for CI Access services. Our analysis indicates that dark fibre is unlikely to sufficiently constrain low bandwidth CI Access services of 1 Gbit/s and below to consider them in the same product market. This is supported by consumer research<sup>65</sup> indicating that only a minority of low bandwidth customers (3% to 8%) consider dark fibre as an alternative service, with the vast majority of respondents saying they would not consider dark fibre either because they prefer a third party to manage the services or due to issues over cost and availability.<sup>66</sup>
- 4.36 The evidence is less clear-cut for VHB services, as the survey results indicate that a larger percentage of customers (20%) consider dark fibre as an alternative service, while pricing data suggests that dark fibre prices are more attractive against VHB charges (see Annex 8). However, “considering dark fibre as an alternative service” is not the same as “switching to dark fibre in response to a SSNIP”, so the survey results are at best ambiguous on whether a sufficient number of VHB customers (13% or more) would switch to dark fibre in the event of a SSNIP.
- 4.37 In summary, our demand-side substitution analysis indicates that:
- 10 Mbit/s services are constrained by 100 Mbit/s services;
  - 100 Mbit/s services are constrained by 1 Gbit/s services;
  - there is a possible break between 1 Gbit/s and VHB services, although the evidence is ambiguous;
  - EFM and asymmetric broadband services are not close demand substitutes for CI Access services; and

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<sup>62</sup> Ofcom, 2018. *Cartesian Business Connectivity Market Assessment*.

[https://www.ofcom.org.uk/data/assets/pdf\\_file/0009/113112/cartesian-business-connectivity-market-assessment.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0009/113112/cartesian-business-connectivity-market-assessment.pdf)

<sup>63</sup> Openreach response to Part 3 of the 15th BCMR s.135 notice dated 16 October 2016, see document entitled “Ethernet Migration Analysis Update”, page 2.

<sup>64</sup> TalkTalk response to Question 1 of the 6<sup>th</sup> s.135 notice dated 20 April 2018; BT response to Question 1 of the 6<sup>th</sup> s.135 notice dated 20 April 2018, “PIR and Inflight Review”, p. 4; and Vodafone response to Question 1 of the 6<sup>th</sup> s.135 notice dated 20 April 2018.

<sup>65</sup> Ofcom, 2016. *Ofcom Business Connectivity Market Review: High bandwidth connections* (2016 BDRC study), Figure 34a and 34b. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0020/32069/bdrc\\_ci\\_survey.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0020/32069/bdrc_ci_survey.pdf).

<sup>66</sup> 2016 BCMR, paragraph 4.284.

- dark fibre is not a close demand substitute for low bandwidth CI Access services (1 Gbit/s and below) but could be one for VHB services.

## Supply-side substitution

### Our approach to supply-side substitution

4.38 Supply-side substitution considers whether competing telecoms providers would be able to switch to supply the focal product in the short term, such that they would impose a constraining effect on the prices of CI Access services at different bandwidths.

4.39 This is consistent with the EC SMP Guidelines which state:

“Supply-side substitutability indicates whether suppliers other than those offering the product or service in question would switch their line of production in the immediate-to-short term or offer the relevant products or services without incurring significant additional costs. Supply-side substitution is particularly relevant for network industries, such as electronic communications, as the same network may be used to provide different types of services.”<sup>67</sup>

4.40 We assess supply-side substitution using the SSNIP framework. We consider whether a telecoms provider supplying other CI bandwidths would respond to an increase in the price of the focal product bandwidth by supplying the focal product. Therefore, supply-side substitution identifies those providers that can profitably supply a customer in response to a SSNIP (i.e. the competitor set available for that customer).<sup>68</sup> This will depend on which providers have networks close enough to the customer site to provide the service rapidly and at a low cost. We first consider the case of supply-side substitution when providers are all connected to a customer site, before then considering the implications if providers need to extend their network.

### Where suppliers are already connected, there is supply-side substitution between CI Access services

4.41 As already mentioned, leased lines of different types are delivered over the same physical network infrastructure. Once the fibre connection is in place, it can be used to provide the full range of leased line services. The only difference between different services is the electronic equipment installed at the circuit ends, and in some cases, the same equipment can be used to provide different leased line bandwidths.

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<sup>67</sup> EC SMP Guidelines, paragraph 28.

<sup>68</sup> Details of the criteria for supply-side substitution were also provided in the European Commission *Notice on Market Definition*, paragraph 22. [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31997Y1209\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31997Y1209(01)&from=EN) [accessed 30 October 2018]. The Notice uses the example of paper production to explain that there is supply-side substitution: although different qualities of paper may not be demand-side substitutes, production can be adjusted to provide the different qualities quickly and with negligible costs.

### Provisional view that there is supply-side substitution where the same equipment is used

- 4.42 In some cases, the same equipment is used to provide different leased line bandwidths. For example, Openreach may use the following services using the same equipment:
- Ethernet services at 10 Mbit/s and 100 Mbit/s;<sup>69</sup>
  - Ethernet services at 100 Mbit/s and 1 Gbit/s (new connections since April 2017);<sup>70</sup> and
  - Ethernet 10 Gbit/s and some WDM services (the XG2010 variant of OSA Filter Connect).<sup>71</sup>
- 4.43 Virgin Media uses the same equipment to provide [Redacted] services.<sup>72</sup>
- 4.44 The provider can switch between the services supplied over the same equipment by adjusting a module in the equipment. This means that in the event of a SSNIP on a particular bandwidth e.g. 1 Gbit/s, providers of 100 Mbit/s services could quickly adjust the equipment to offer a 1 Gbit/s service with negligible cost, thereby rendering the SSNIP unprofitable.
- 4.45 Our provisional conclusion is that it is clear that there is supply-side substitution between CI Access services supplied over the same equipment. In particular, we consider that there will be supply-side substitution between Ethernet services at 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, such that in the event of a SSNIP on any of these bandwidths, suppliers of other bandwidths would reconfigure their equipment to offer the focal product quickly and with negligible cost.
- 4.46 A similar conclusion can be reached between Ethernet services at 10 Gbit/s and WDM services, as well as across WDM services of different bandwidths, which share the same equipment. For example, in the event of a SSNIP on WDM services, a supplier of 10 Gbit/s could quickly adjust the equipment to provide some WDM services (e.g. single fibre OSA Filter Connect) at negligible cost.<sup>73</sup>

### Suppliers of one bandwidth can quickly start offering another bandwidth by changing equipment

- 4.47 In some cases, suppliers need to use different equipment to provide leased lines of different bandwidths. For example, Ethernet services at 1 Gbit/s and 10 Gbit/s use different equipment at either end of the circuit. We consider that in this case there is also supply-side substitution as, in the event of a SSNIP on 10 Gbit/s services, a provider of 1 Gbit/s could quickly offer 10 Gbit/s services at minimal cost.

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<sup>69</sup> 2016 BCMR, paragraph 4.130.

<sup>70</sup> Openreach's response to question 5 of the 8<sup>th</sup> s.135 notice dated 20 April 2018, see document entitled "Leased Line Charge Control Ethernet Prices for April 2018", dated 26 February 2018, page 3.

<sup>71</sup> Openreach's response to question 4 of the 8<sup>th</sup> s.135 notice dated 20 April 2018, see document entitled "New pricing and product launches for VHB portfolio", page 10. Note that "all variants of OSA Filter Connect require temperature-hardened optics and a filter, which are not used in providing 10G EAD services".

<sup>72</sup> Notes from meeting between Ofcom and Virgin Media on 3 May 2018.

<sup>73</sup> Openreach's response to 8<sup>th</sup> s.135 notice dated 18 April 2018, see document entitled "New pricing and product launches for VHB portfolio", page 10.

- 4.48 A provider of a 1 Gbit/s Ethernet service would need to purchase different equipment to start providing a 10 Gbit/s Ethernet service. The equipment for different bandwidths is readily available on a global market such that any operator capable of supplying a 1 Gbit/s circuit can readily offer a 10 Gbit/s circuit by purchasing and installing different end equipment. The same engineers who install 1 Gbit/s equipment are also able to install 10 Gbit/s equipment (and vice versa) such that no significant costs or risks are involved in offering the different bandwidths. As a result, most suppliers offer and sell the full range of CI Access services and no significant investments are required to start offering additional bandwidths. Moreover, the cost of equipment typically accounts for a very small proportion (less than 10%) of the overall cost of providing a leased line.<sup>74</sup>
- 4.49 Based on the above, we consider that where telecoms providers are already connected to a customer site, there will be supply-side substitution between CI Access services provided either over the same or different equipment.

### **Where suppliers do not have an existing connection, competitive conditions do not differ by bandwidth**

- 4.50 In practice, not all suppliers have an existing connection to the customer so for supply-side substitution to occur in those circumstances, a supplier may need to extend its network to provide a leased line service. Our assessment considers whether there is a sufficiently similar ability and incentive for operators to build out from their network to provide different bandwidths. If suppliers would react similarly across bandwidths in response to a SSNIP, these bandwidths can be combined into a single market.
- 4.51 The ability of a firm to supply a particular customer depends on the proximity of its network to that customer. A supplier with a network that is closer to the customer has a significant cost advantage over one that is further away. Customers may also face greater inconvenience if choosing to switch to suppliers located further away, due to the duration and uncertainty of the time taken for the supplier to extend its network. However, where significant dig distances are required this creates challenges in supplying all bandwidths. We have identified no significant differences in the technical requirements or costs in extending a network to supply one bandwidth or another (i.e. a supplier that is capable of supplying 1 Gbit/s is equally able to supply 10 Gbit/s).<sup>75</sup> Accordingly, on the supply side, we would expect competitive conditions to be the same across all products.
- 4.52 There are some indications that in practice some suppliers have been prepared to extend their networks different distances for higher bandwidth products. We have therefore also considered whether the distance over which operators would be able to compete to supply a customer in the event of a SSNIP (by the incumbent supplier) varies by bandwidth.
- 4.53 We consider the following in our assessment:

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<sup>74</sup> We set out our analysis of these costs in Table 3.9. This analysis shows that infrastructure costs represent between 97.1% and 99.7% for 1 Gbit/s services and between [REDACTED]% and [REDACTED]% for 10 Gbit/s services.

<sup>75</sup> As established above, the cost of equipment tends to have a very small contribution to the overall cost of supplying leased line services.

- evidence on the economic dig distance for different bandwidths based on the revenues of different CI Access services and the costs of extending networks;
- evidence on how inconvenience to customers varies by distance; and
- evidence on actual digging behaviour by providers of CI Access services.

### The economic dig distance for different bandwidths

- 4.54 We have estimated the distance over which suppliers would find it profitable (and hence economic) to extend their network for each CI Access service given current price levels. We compare the incremental revenues (assuming current price levels) to the incremental costs derived from supplying different services. This is based on Openreach’s costs and current wholesale charges.<sup>76</sup> Our analysis is set out in detail in Annex 10.
- 4.55 The results are based on a set of assumptions for costs (including, among others, the type of terrain), which reflect average costs in more urban areas. However, costs are likely to vary to some extent in practice and thus it may be economic to dig further in areas where digging costs are lower. As these factors are unlikely to correlate with bandwidth requirements the assumptions are useful for a comparison across bandwidths.
- 4.56 Table 4.2 presents a summary of the results. It shows the economic dig distances<sup>77</sup> for Ethernet services at 100 Mbit/s, 1 Gbit/s, and 10 Gbit/s.<sup>78</sup> We present the results for different payback periods.

**Table 4.2: Economic dig distance for different CI Access services (metres)**

Payback period	100 Mbit/s	1 Gbit/s	10 Gbit/s
3 years	27	43	95
5 years	47	69	120

Source: Ofcom analysis set out in Annex 10.

- 4.57 This shows that, based on April 2018 charges, the maximum economic dig distance for VHB services is significantly longer than for lower bandwidth services. For example, for a typical three-year payback period, the maximum economic dig distances for 100 Mbit/s and 1 Gbit/s are 27m and 43m respectively, while for 10 Gbit/s is 95m. At current charges, a supplier of a VHB service would not necessarily be willing to provide lower bandwidths, as it would find it economic to provide a VHB connection over a greater distance than would be economic to provide lower bandwidths.
- 4.58 However, the longer economic distances for VHB are likely to be distorted by BT’s high VHB charges where, even after its recent reduction (of nearly 40%) in wholesale charges, it

<sup>76</sup> Incremental revenues include connection and rental charges based on Openreach’s price list for EAD LA circuits. Incremental costs include passive costs (i.e. costs of extending the physical infrastructure) and active costs (i.e. costs of the electronic equipment). Passive costs are based on Openreach’s Excess Construction Charges (ECCs).

<sup>77</sup> These distances shown have been converted from actual route distances to radial (straight-line) distances.

<sup>78</sup> We do not include the economic dig distances for 10 Mbit/s services as they are broadly similar to 100 Mbit/s given that the wholesale charges and the equipment costs for both services are almost identical.

earns substantially higher returns than for other CI Access services. Therefore, caution should be taken when drawing conclusion on these distances for market definition purposes.

#### **Evidence on customer inconvenience**

- 4.59 Our economic dig distance analysis above may overstate the distance over which telecoms providers are able to compete. This is because digging to connect a customer is a time-consuming activity which delays the provision of the service. The length of the delay is sometimes outside the control of the telecoms provider as it can be subject to factors such as site owners agreeing wayleaves in a timely manner. This is in contrast to a situation where the customer site is already connected and thus the service could be readily available to the customer. As customers attach some value to the time to connect, networks which are further away from the customer site would be disadvantaged against the incumbent supplier.
- 4.60 Evidence set out in Annex 11 suggests that digging result in a provision time, for CI Access services, of 178 working days (on average).<sup>79</sup> This is significantly longer than the mean time to provide for all orders (56 working days on average), and for fibre-connected orders (12 working days on average).<sup>80</sup>
- 4.61 Consumer research suggests these service delays represent an inconvenience for customers. The 2016 BDRC study, which we commissioned for the 2016 BCMR, found that a majority of respondents (51%) choose their existing supplier because they are already connected to its network.<sup>81</sup> It also found that the most frequent obstacle found by respondents who said that they experienced problems when migrating to an alternative service was ‘time taken to deliver service/long delay in installation’. This is consistent with the results from the Cartesian 2018 report which indicate that service delays are the key problem facing leased line customers.
- 4.62 The evidence therefore suggests that CI Access customers may not be prepared to wait long enough for their service to be up and running for them to consider moving to a new supplier that would have to dig. This impacts the supply of leased lines at all bandwidths and thus may reduce the extent to which dig distances vary by bandwidth in practice.

#### **Evidence on actual digging behaviour**

- 4.63 In the following paragraphs, we explain that competition based on expanding networks to compete with Openreach for specific leased line customers is not a significant feature of

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<sup>79</sup> This evidence is based on information about the time it takes Openreach to provide different types of leased line Ethernet orders (all orders, orders with duct work, and ‘quick wins’), and the relationship between time-to-provide and dig distance. We collected this information from Openreach via our s.135 powers (see Annex 11 for further details).

<sup>80</sup> Openreach data set out in Annex 11.

<sup>81</sup> BDRC 2016 study, Figures 23 and 24.

the market. This means that any possible differences in the propensity to dig further for some bandwidths have little impact in practice.

- 4.64 Evidence on actual digging behaviour, set out in detail at Annex 11, shows that telecoms providers rarely extend their networks to supply leased lines at any bandwidth. Based on data submitted by telecoms providers, we estimate that suppliers (other than Openreach) dug for 5% of all new connections provided in 2017 irrespective of the bandwidth provided.<sup>82</sup> For low bandwidth services (1 Gbit/s and below), most new connections were either provided using a third-party network (52%) or were already fibre connected or required fibre work but no duct work (44%). For VHB, the majority of new connections were already fibre connected (80%) and most of the remainder were provided using a third-party network (18%).
- 4.65 Where not fibre connected, the data indicates the propensity to dig is low and is similar across bandwidths, with just 3%<sup>83</sup> of new connections involving duct work both for 1 Gbit/s and below connections and VHB connections. The low propensity to dig could be partly due to the disadvantage faced by a supplier who needs to extend its network compared to one who is already connected. So, although we may in theory expect telecoms providers to dig more often for higher value customers, this disadvantage means that telecoms providers may not dig at all in practice (irrespective of the bandwidth provided), particularly if one supplier is already connected to the customer site.
- 4.66 When telecoms providers do dig, the dig distance is similar across all bandwidths: while the actual median dig distance is 20m for bandwidths of 1 Gbit/s and below, this is 18m for VHB services.<sup>84</sup> However, this data covers very few digs (just 17 in the case of VHB in 2017), so little weight can be placed on the data given the small number of digs.

### **We propose to define a single market for CI Access services at all bandwidths**

- 4.67 Based on our analysis above, we consider that different bandwidths are supply-side substitutes where a telecoms provider has an existing connection to the customer, such that a hypothetical monopolist of a given bandwidth would not be able to profitably impose a SSNIP. Where telecoms providers do not have an existing connection, the evidence indicates that their ability to supply in response to a SSNIP does not differ by bandwidth, therefore pointing at similar competitive conditions across all bandwidths.
- 4.68 We recognise that if some leased lines have particularly higher prices and margins, it may be more profitable for a provider to extend its network to supply those lines than to extend its network to supply less profitable lines. However, these higher prices could be themselves a reflection of BT's market power where Openreach is not constrained by price regulation, so the higher dig distances may not necessarily be a reflection of any fundamental difference in supply-side conditions. Moreover, evidence on actual digging

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<sup>82</sup> These connections include leased line and dark fibre connections.

<sup>83</sup> Excludes dark fibre connections for which information about the bandwidth provided over these connections was not available.

<sup>84</sup> These distances are actual dig distances. The radial (straight-line) distances are 14m for bandwidths of 1 Gbit/s and below, and 13m for VHB.

primarily shows that digging occurs very rarely and that when it does, distances are low for all bandwidths. This is consistent with competitive conditions being similar across all bandwidths.

- 4.69 Based on this evidence, we consider leased line suppliers are equally able to supply all bandwidths and to switch between them at low cost and quickly, pointing to a single market on the supply side. We have therefore considered all bandwidths together in a single market.

### **Dark fibre substitution**

- 4.70 The provision of dark fibre differs only from the supply of CI Access services in that the equipment is installed and managed by the customer itself, or another supplier, rather than by the infrastructure provider.
- 4.71 To assess the supply-side constraints imposed by dark fibre on CI Access services, we have applied a similar approach to our analysis above. Namely, we have considered whether, in response to a SSNIP, dark fibre suppliers could start supplying CI Access services in the short term and without incurring significant additional costs, and whether the ability and incentives to do this change depending on the bandwidth.

### **Dark fibre is a close supply-side substitute when customers are already fibre connected**

- 4.72 When already connected to the customer site, a dark fibre provider would need to purchase and install equipment at both ends of the circuit to start supplying CI Access services to end customers. The dark fibre provider would also need to maintain and manage this equipment.
- 4.73 If the dark fibre provider does not already sell active services, then it is possible that the cost involved in starting to install and maintain equipment may be such that it would not be profitable to start providing CI Access services in response to a SSNIP. However, as the main dark fibre providers (e.g. CityFibre, Zayo, EU Networks and Colt) all supply both dark fibre and CI Access services we consider that they would be able to provide CI Access services sufficiently quickly and at minimal cost in the event of a SSNIP.
- 4.74 This is supported by evidence set out in Annex 14, which suggests that CityFibre's dark fibre service competes for CI Access customers of all bandwidths.<sup>85</sup> It is further supported by evidence from price data submitted by telecoms providers which indicates that dark fibre prices are competitive against the range of CI Access services, even after accounting for the costs of equipment (see Annex 8).

### **Where suppliers are not already connected, dark fibre providers are equally able to supply CI Access services as other CI Access suppliers**

- 4.75 Where it is not already connected to the customer site, the dark fibre provider needs to extend its network to start supplying CI Access services. As set out above, a telecoms

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<sup>85</sup> 2016 BCMR, paragraph A20.80.

provider would only extend its network if it is economic to do so. The further the dark fibre provider needs to dig, the less economic it is to connect the customer. Given that dark fibre providers could start supplying CI Access services sufficiently quickly and at a minimal cost, we consider that the same economic dig distance analysis conducted for CI Access services applies for dark fibre.

- 4.76 Therefore, where its network is close enough to the customer site, we consider that a dark fibre supplier would place as strong a supply-side constraint on the provision of CI Access services as any other CI Access supplier, and would be similar for all bandwidths. For this reason we provisionally conclude that dark fibre, when used to supply or self-supply CI Access services, is in the same product market as CI Access services.

### **Provisional conclusion on CI Access product market definition**

- 4.77 We provisionally conclude that there is a single market for CI Access services at all bandwidths, which includes all wholesale fibre-based Ethernet and WDM services used to connect end customers to fibre networks. This market includes dark fibre used to self-supply or supply CI Access services but excludes business grade connectivity services provided over EFM, as well as symmetric and asymmetric broadband.

### **Consultation question(s)**

Question 4.1: Do you agree with our proposed approach to product market definition?  
Please provide evidence to support your views.

Question 4.2: Do you agree with our proposed CI Access product market definition?  
Please provide evidence to support your views.

## 5. CI Access: geographic market definition

- 5.1 In this section we consider the relevant geographic markets for CI Access services. In defining geographic markets, we aim to identify areas in which the conditions of competition are sufficiently homogeneous, and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are significantly different.<sup>86</sup>
- 5.2 Our analysis of competitive conditions focuses on the presence of rival infrastructure as the main factor determining the prevailing conditions of competition in a given location. We analyse network presence across the UK and group together areas with similar levels of rival infrastructure. Where we identify areas as having a high presence of rival infrastructure (at least two rival networks within the distance over which it would be economic to dig to connect business sites), we conduct further analysis to consider whether competitive conditions within those areas are homogeneous. We refer to these as High Network Reach (HNR) areas.
- 5.3 Based on our analysis, we provisionally define the following relevant geographic markets:
- BT Only areas;
  - BT+1 areas;
  - the Central London Area;
  - HNR areas of each of Birmingham, Bristol, Edinburgh, Glasgow, Leeds and Manchester (we refer to these as the “Metro Areas”);
  - all other HNR areas (taken together); and
  - the Hull Area.
- 5.4 This section is structured as follows:
- we set out our approach to geographic market definition; and
  - we present the results.

### Approach to geographic market definition

#### Overall approach

- 5.5 After the relevant product market has been identified, the purpose of geographic market definition is to identify the areas in which competitive conditions are homogeneous, and distinct from other areas in which the conditions of competition are significantly different, so that a proper assessment of market power can be undertaken.

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<sup>86</sup> EC SMP Guidelines, paragraph 48.

- 5.6 In principle, each customer buying leased lines faces conditions of competition that are specific to their location.<sup>87</sup> However, for the purposes of conducting this review, it is not practicable to assess whether an operator has SMP for each customer location (of which there are hundreds of thousands). Instead, we aggregate customer locations with similar competitive conditions into candidate markets to undertake further assessment.
- 5.7 Customer sites will be most competitive where there are multiple networks present with existing fibre connections. However, as this situation is rare, in our geographic analysis we primarily focus on the competitive constraint arising from the potential for nearby rival networks to build a new connection to the customer. This means that the proximity of rival infrastructure is the key factor determining the competitive conditions in the provision of leased lines. Therefore, in identifying differences in competitive conditions across geographies, we focus on measuring the proximity of rival infrastructure.
- 5.8 As in 2016 BCMR, we rely on network reach analysis to measure the proximity of rival infrastructure. Network reach is a measure of the number of rival networks with infrastructure within a given radial distance of a customer location. Our network reach analysis does not account for the possibility of telecoms providers to connect to customer sites if a DPA remedy was available for the purpose of providing leased lines.
- 5.9 Our geographic analysis has the following steps:
- we measure network reach for each large business site in the UK;
  - we calculate the distribution of network reach across the large business sites in each postcode sector in the UK;<sup>88</sup>
  - we group together postcode sectors with similar levels of network reach; and
  - we examine in more detail areas with high presence of rival infrastructure, corresponding to the presence of at least two sufficiently close rival networks (HNR areas).

## Network reach analysis

- 5.10 The network reach analysis calculates, for each postcode sector in the UK, the number of telecoms providers supplying leased lines other than BT that have network within reach of the business sites in that postcode sector. This allows us to identify postcode sectors that are likely to have sufficiently homogeneous conditions of competition.
- 5.11 This analysis uses a number of parameters which we explain below.

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<sup>87</sup> We note that there are some factors which can mean competitive conditions are not purely site-by-site, e.g. competitive conditions will be more homogeneous across areas if it is difficult to price discriminate between customers, if businesses are not aware of the location of rival networks and if the incentive to extend a network to supply a given customer is affected by the likelihood of later connections from neighbouring customers.

<sup>88</sup> A postcode sector is the area corresponding to all postcodes sharing the same characters except the last two letters, e.g. BT76 0 or N6 4. There are approximately ten thousand postcode sectors in the UK.

## Business sites

- 5.12 As in 2016 BCMR, we analyse network reach based on a database from Market Location. We base our analysis on the sites of businesses and government sites with 250 or more employees nationally.<sup>89</sup> In total, this database contains the locations of over 164 thousand sites including businesses, schools, councils, and hospitals and other public sector organisations. We also include mobile base stations that currently use leased lines, totalling over 26 thousand, which we identify from MNO leased line inventory data.<sup>90</sup> We consider that this is a reasonable proxy for the location of businesses likely to purchase leased lines.<sup>91</sup>
- 5.13 To calculate network reach for a business site, we need to measure its location. We assume that business sites are located at the centroid of their postcode (this is the mean grid reference of all postal delivery points in that postcode).<sup>92</sup> This is because with the data available we can only identify business site locations with reference to the postcode. This could result in a measurement error in large postcodes with business sites located further away from the centroid. However, in most cases this will not have a significant impact on the results of the network reach analysis, as the area covered by a postcode tends to be small in densely populated and business regions.<sup>93</sup> We also consider that our selected buffer distance of 50m (see below) is conservative and so accounts for this.

## Rival networks

- 5.14 Our network reach analysis measures the extent of networks other than BT, which we term rival networks. BT's network is ubiquitous (outside of the Hull Area) so we are interested in distinguishing between areas where there are differences in the extent of competition from rival networks.
- 5.15 We measure the extent of a network based on the location of an operator's duct. We consider that distance to an operator's duct is the most appropriate measure of network reach as most of the costs of network extension relate to the cost of constructing new duct to the customer site.

## Buffer distance

- 5.16 The first step of the network reach analysis is to define a distance over which we can identify sufficiently close rival networks, the buffer distance.<sup>94</sup> We have based the buffer distance on the economic distance over which operators could extend their network to supply a customer. As we noted in Section 4, the majority of customers are not connected to multiple networks, so we first need to calculate how close rival networks need to be to a

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<sup>89</sup> The Tribunal indicated that it considered this approach to be appropriate (see paragraph 421 of the BCMR Judgment).

<sup>90</sup> Stakeholder responses to questions A1 and A2 of the 5<sup>th</sup> BCMR s.135 notice.

<sup>91</sup> We considered instead basing the analysis on the location of new connections in 2017. However, as these are fewer than the number of business sites, this created a risk of having too few observations per postcode sector.

<sup>92</sup> The Tribunal indicated that it considered this approach to be appropriate (see paragraph 426 of the BCMR Judgment).

<sup>93</sup> Densely populated and business regions are the focus of our analysis as they are the areas more likely to be effectively competitive or have the potential to become so within this review period.

<sup>94</sup> To implement the network reach analysis, the buffer distance is calculated as a radial (straight line) distance.

- business site so that it would be economic for them to extend their network to serve that customer.
- 5.17 To determine the buffer distance, we have considered evidence on how close operators need to be to a customer site for them to extend their network. This evidence is the same as that used in assessing supply-side substitution in Section 4 and is presented in more detail in Annex 10.
- 5.18 Our provisional view, based on this evidence, is that a buffer distance of 50m is an appropriate basis for measuring network reach. A 50m buffer distance is consistent with our modelling of the economic dig distance for the vast majority of CI Access services. Based on a three- or five-year payback period, this analysis suggests that telecoms providers would not find it economic to dig further than 43m or 69m radial distance respectively for a 1 Gbit/s circuit. For VHB services, our modelling of the economic dig distance suggests that telecoms providers could find it economic to dig up to 95m or 120m radial distance at current prices, based on a three- or five-year payback period respectively (see Table A10.6 in Annex 10), reflecting the higher margins BT earns on these circuits.
- 5.19 A 50m buffer distance is also consistent with actual digging behaviour for circuits at all bandwidths. Telecoms providers excluding Openreach chose to build in less than 10% of their 2017 new customer ends where they did not already have an existing duct connection. This is consistent with evidence from customers that the length of time taken to install a new connection is a factor in choosing a supplier and that, based on our analysis, connection times are significantly longer when duct work is involved.<sup>95</sup>
- 5.20 Where telecoms providers have decided to build rather than buy Openreach products, our analysis of the evidence indicates that the median dig is made from 14m away from the customer; 78% of digs are made from less than 50m away.<sup>95</sup> This suggests that the frequency of network extension is much more common when rival networks are located very close to the customer and unusual when they are located further than 50m away. Collectively, we consider that this evidence suggests that a relatively short buffer distance is likely to be appropriate at all bandwidths.
- 5.21 We consider that a buffer distance of 50m is conservative, and indeed, some of the evidence could suggest that a shorter distance of about 25m is appropriate: the evidence on actual digging behaviour suggests that telecoms providers are proportionately more likely to extend their network when they are within 25m of a customer site, rather than when they are 25-50m away (see Table 11.4, Annex 11). A buffer distance lower than 50m would also be consistent with our cost calculations over a typical three-year contract term (set out in Table A10.6, Annex 10) for the vast majority of CI Access circuits.
- 5.22 However, to be able to use such a buffer distance, we would need to be able to measure very precisely the distance that telecoms providers would need to dig to reach prospective sites. We consider that our network reach analysis, though granular, is not able to be this precise. As we explained above, we measure business locations using postcodes, assuming

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<sup>95</sup> See Annex 11.

that each business is located at the centroid of its postcode. We therefore do not consider it appropriate to use a shorter distance than 50m. In Annex 13, we provide network reach results at a 100m buffer distance for sensitivity.

### Appropriate geographic unit

5.23 As in 2016 BCMR, we have aggregated the results of the network reach analysis carried out at a postcode level into postcode sectors.<sup>96</sup> Competitive conditions may vary within postcode sectors to some extent, in that some customer locations will face higher network reach and others lower. However, we consider that it would not be appropriate or practical to use smaller and more numerous geographic units than postcode sectors, which themselves number over ten thousand. Using postcodes as our geographic unit of aggregation would result in excessive granularity as there are approximately 1.75 million unique postcodes in the UK and we do not consider that it would give rise to a materially different analysis.<sup>97</sup>

### Network coverage threshold

5.24 We have considered what proportion of the business sites within a postcode sector need to be within our buffer distance for the postcode sector to be considered covered by rival networks. We consider that it is not necessary for 100% of the business sites in a postcode sector to be within the buffer distance. We note that not all sites of large businesses may require leased lines and networks are likely to be closer to the sites that do require them. Also, using the postcode centroid to measure business sites location may introduce a small degree of measurement error, so that a requirement for 100% coverage would be likely to overstate the degree of network coverage required. As in our review of the Wholesale Broadband Access market, we consider that if rival networks are able to supply more than 65% of large business sites in an area, the area can be considered covered by rival networks.<sup>98</sup>

### Sensitivity analysis

5.25 We have carried out sensitivity analysis on the above parameters, which is presented in Annex 13. We find that changes in these parameters would not give rise to materially different results.

## Aggregation of postcode sectors into geographic markets

5.26 Given that there are approximately ten thousand postcode sectors in the UK, it is not practicable for us to conclude on whether BT has SMP in each individual postcode sector as a geographic market. Therefore, we have sought to aggregate postcode sectors into groups

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<sup>96</sup> The Tribunal indicated that it considered this approach to be appropriate (see paragraph 425 of the BCMR Judgment).

<sup>97</sup> ONS. *Postal geography*. <https://www.ons.gov.uk/methodology/geography/ukgeographies/postalgeography> [accessed 23 October 2018].

<sup>98</sup> 2018 WBA Statement, paragraph 4.68.

where competitive conditions are similar. This is consistent with the BEREC Common Position, which states that:

- “[the] number of geographic units will depend on the circumstances of the case, however, as experience shows, the number will usually be significant and may even go up to several thousands. Although it would theoretically be possible to make a separate SMP analysis for each of these units, it is likely to be more appropriate and more practical to aggregate units according to the homogeneity of competitive conditions, consistent with the SMP Guidelines”.<sup>99</sup>

- 5.27 As an initial step, we have grouped postcode sectors according to the results of the network reach analysis, setting the threshold between each group at each unit of network reach. In other words, we identify the group of postcode sectors not covered by any rival networks as distinct from those covered by one rival network, two rival networks and so on for each additional rival network. We have then carried out sensitivity analysis around the thresholds used to differentiate between these groups.
- 5.28 We consider other indicators of competition to further assess where competitive conditions may differ within and across these groups. This assessment is informed by a closer analysis as to whether the proximity of rival networks differs between areas. Where competitive conditions across groups are sufficiently similar, we have combined them into a single geographic market. The results of this analysis are set out in the remainder of this section.

## Geographic market assessment

### Application of the network reach analysis

- 5.29 The results of our network reach analysis are shown in Figure 5.1. This shows that most of the UK has very limited coverage by networks other than BT and that areas with high presence of rival infrastructure are concentrated in major metropolitan areas.

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<sup>99</sup> BEREC, 2012. BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines (BoR (12) 126), paragraph 91. [https://berec.europa.eu/eng/document\\_register/subject\\_matter/berec/download/0/1096-revised-berec-common-position-on-best-pr\\_0.pdf](https://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/1096-revised-berec-common-position-on-best-pr_0.pdf) [accessed 29 October 2018].

Figure 5.1: Map of network reach in the UK



Source: Ofcom network reach analysis.

5.30 Table 5.2 illustrates that almost three-fifths of the postcode sectors in the UK can be categorised as BT Only areas, meaning that no more than 65% of the large business sites in those postcode sectors have a rival network within reach. Over a third of postcode sectors have just one rival network within reach of large business sites, and only 6% of postcode sectors have two or more rival networks within reach of the average large business site. However, the last category of postcode sectors accounted for 18% of all CI Access circuit ends connected in 2017.

**Table 5.2: Network reach in the UK excluding the Hull Area**

Network	Postcode sectors		Large business sites		Customer ends connected in 2017	
	Number	Share**	Number	Share**	Number	Share**
BT Only*	5,810	58%	93,918	52%	30,076	48%
BT+1 rival network	3,584	36%	75,009	42%	21,533	34%
HNR areas	576	6%	11,543	6%	11,395	18%
<b>Total UK excl. the Hull Area</b>	<b>9,970</b>	<b>100%</b>	<b>180,470</b>	<b>100%</b>	<b>63,004</b>	<b>100%</b>

Source: Ofcom network reach and circuit data analysis

\*Defined as postcode sectors where no more than 65% of large business sites have a rival network to BT within 50m

\*\*Percentages presented in this table may not add up to exactly 100% due to rounding.

### Proposal that the Hull Area constitutes a distinct geographic market

5.31 BT has minimal network presence in the Hull Area where KCOM is the historic incumbent. We therefore consider that the competitive conditions in the Hull Area are sufficiently distinct from the rest of the UK to constitute a separate geographic market. This is consistent with our long-standing position on competition in the Hull Area. Our assessment of business connectivity markets in the Hull Area is set out in Section 9.

### Proposal that BT Only areas constitute a distinct geographic market

5.32 We consider that postcode sectors where no more than 65% of businesses have a rival network to BT within an economic supply distance (BT Only areas) are likely to have competitive conditions which are sufficiently homogeneous and different from postcode sectors which have rival networks to be considered a distinct geographic market. Customers in BT Only areas will have little or no choice and are mainly dependent on BT. Our analysis has found that on average a customer connected in 2017 in these areas is 1.2km from the nearest rival network, indicating almost total reliance on BT. As set out below, this excludes three postcode sectors classified as BT Only which are in the CLA, which we propose to include in the CLA geographic market. The total number of postcode sectors in the BT Only geographic market is thus 5,807.

**Table 5.3: Average distance of the closest rival networks to customers connected in 2017 in different network reach areas**

Network	Average distance from customer sites to		
	Closest rival network	2 <sup>nd</sup> closest rival network	3 <sup>rd</sup> closest rival network
BT Only*	1.2km	2.7km	4.9km
BT+1 rival network	62m	0.3km	0.9km
HNR areas	18m	31m	58m

*Ofcom network reach and circuit data analysis.*

*\*Defined as postcode sectors where no more than 65% of large business sites have a rival network to BT within 50m*

### **Proposal that BT +1 areas constitute a distinct geographic market**

- 5.33 We consider that postcode sectors where businesses are covered by just one rival network to BT (BT+1 areas) are likely to have competitive conditions which are sufficiently homogeneous and different from postcode sectors with either fewer or more rival networks to constitute a separate market. This is supported by Table 5.3, which shows that the distance to the closest rival network is much shorter than in BT Only areas, but much longer than in BT+2 or more areas.
- 5.34 In BT+1 areas, more than 65% of businesses will have access to a sufficiently proximate alternative to BT. However, the 62m average distance to the closest rival indicates that many business customers would not have such an alternative and that very few would have more than one alternative to BT. This is materially different to BT+2 or more areas, where more than 65% of businesses have two rival networks within a potentially viable supply distance and where some customers may face active competition from three suppliers or more. We therefore consider that competitive conditions in BT+1 areas are likely to be sufficiently distinct from BT Only areas and from areas with two or more rival networks to constitute a separate geographic market. As set out below, this excludes 15 postcode sectors classified as BT+1 which are in the CLA, which we propose to include in the CLA geographic market. The total number of postcode sectors in the BT+1 geographic market is thus 3,569.

### **Analysis of HNR areas**

- 5.35 We consider that postcode sectors with at least two rival networks to BT may have the potential to support effective competition. In total, we have identified 576 postcode sectors that are areas of HNR by this measure. We consider that a sector-by-sector analysis would be impractical given this number. We have therefore examined these HNR areas in more detail to assess whether competitive conditions are sufficiently homogeneous to consider all of them as a single geographic market, or whether some of them constitute distinct geographic markets. In doing so we consider factors which are likely to influence competitive conditions, namely the level of demand as measured by the number of new connections and the extent and proximity of rival networks.

- 5.36 Postcode sectors with two or more rival networks tend to be clustered in cities. Within each Metro Area, most of these postcode sectors are clustered together. As competitive conditions within nearby HNR postcode sectors are likely to be similar (as the same telecoms providers' networks may extend across neighbouring postcode sectors), in our analysis we have grouped together the HNR postcode sectors within metropolitan areas.<sup>100</sup>
- 5.37 The most significant of these clusters is in London, which accounts for over half of all HNR postcode sectors. In 2017, more than seven in ten new circuits connected within HNR areas were in this London area.
- 5.38 In 2016 BCMR, we defined a distinct market for the Central London Area (CLA). The CLA broadly corresponds to the Central Activities Zone defined by the Greater London Authority as London's business centre, accounting for a third of London's jobs and 10% of the UK's economic output.<sup>101</sup> We have looked in more detail as to whether competitive conditions are homogeneous between the HNR areas in the CLA<sup>102</sup> and other HNR areas across London.
- 5.39 Table 5.4 shows the HNR postcode sectors by Metro Area, ordered by the number of new CI Access connections in 2017. After London, the next three largest clusters each accounted for approximately 700 business sites (about 6% of the business sites in HNR areas) and more than 400 new connections in 2017 (about 4% of the new connections in 2017 in HNR areas), after which the number of business sites and new connections declines rapidly. Nevertheless, we consider that the six largest clusters after London constitute sufficiently material numbers of connections to merit a detailed assessment and to calculate meaningful service shares. We thus consider separately the CLA, the rest of London and each of the other six largest clusters. We then consider all other HNR postcode sectors as a single grouping.<sup>103</sup>

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<sup>100</sup> This grouping has been conducted using the postcode area, defined by the first one or two letters the postcode. For example, postcode sectors beginning with M are considered to be in Manchester, whereas those beginning with EH are considered to be in Edinburgh. We have identified postcode sectors in London as those beginning with E, EC, N, NW, SE, SW, W and WC.

<sup>101</sup> Greater London Authority, 2018. *Central Activities Zone*. <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/central-activities-zone> [accessed 29 October 2018].

<sup>102</sup> All but 18 postcode sectors in the CLA are classified as HNR in the present analysis. Three postcode sectors are currently classified as BT Only and 15 postcode sectors are currently classified as BT+1. They are included in the results presented earlier for the BT Only and BT+1 areas, respectively.

<sup>103</sup> We do not consider it practical to subdivide further as the number of connections in these other areas becomes too small to draw meaningful conclusions.

Table 5.4: HNR areas by Metro Area

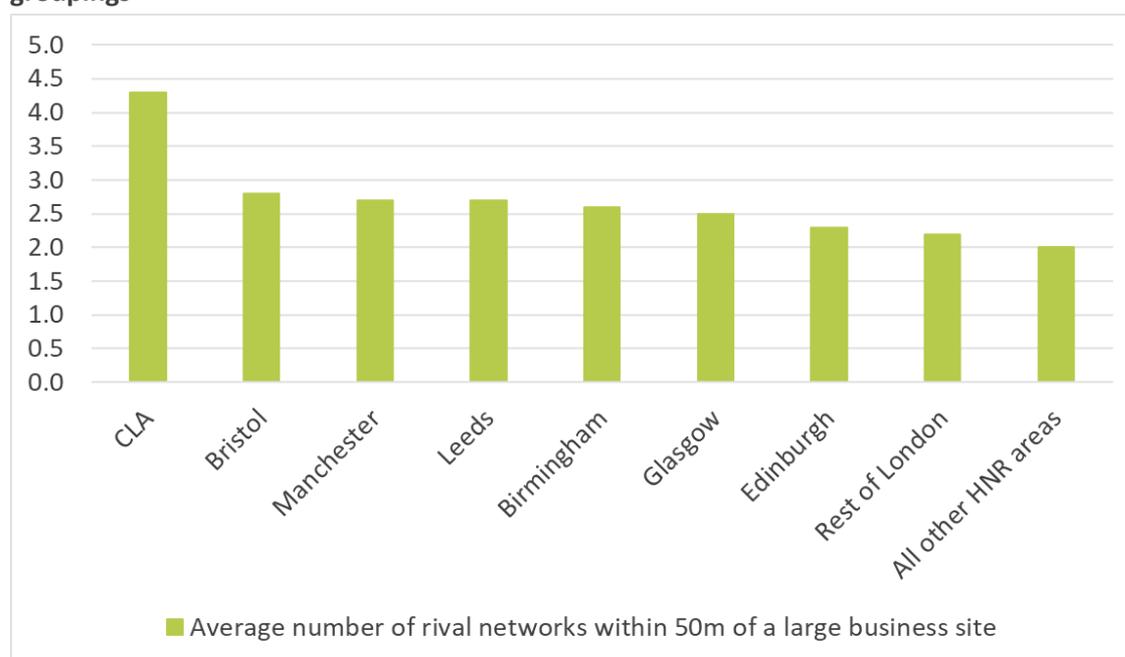
Area	HNR postcode sectors		Large business sites		Customer ends connected in 2017	
	Number	Share*	Number	Share*	Number	Share*
London, of which:	295	51%	5,385	47%	8,011	70%
CLA	258	45%	4,361	38%	7,355	65%
Rest of London	37	6%	1,024	9%	656	6%
Edinburgh	20	3%	665	6%	443	4%
Manchester	33	6%	704	6%	439	4%
Glasgow	19	3%	701	6%	402	4%
Leeds	14	2%	493	4%	300	3%
Bristol	10	2%	345	3%	268	2%
Birmingham	9	2%	324	3%	230	2%
Liverpool	33	6%	276	2%	203	2%
Sheffield	7	1%	327	3%	131	1%
Nottingham	6	1%	260	2%	122	1%
Reading	6	1%	134	1%	102	1%
All other HNR areas	124	22%	1,929	17%	744	7%
<b>Total HNR areas</b>	<b>576</b>	<b>100%</b>	<b>11,543</b>	<b>100%</b>	<b>11,395</b>	<b>100%</b>

Source: Ofcom network reach and circuit data analysis

\*Percentages presented in this table may not add up to exactly 100% due to rounding.

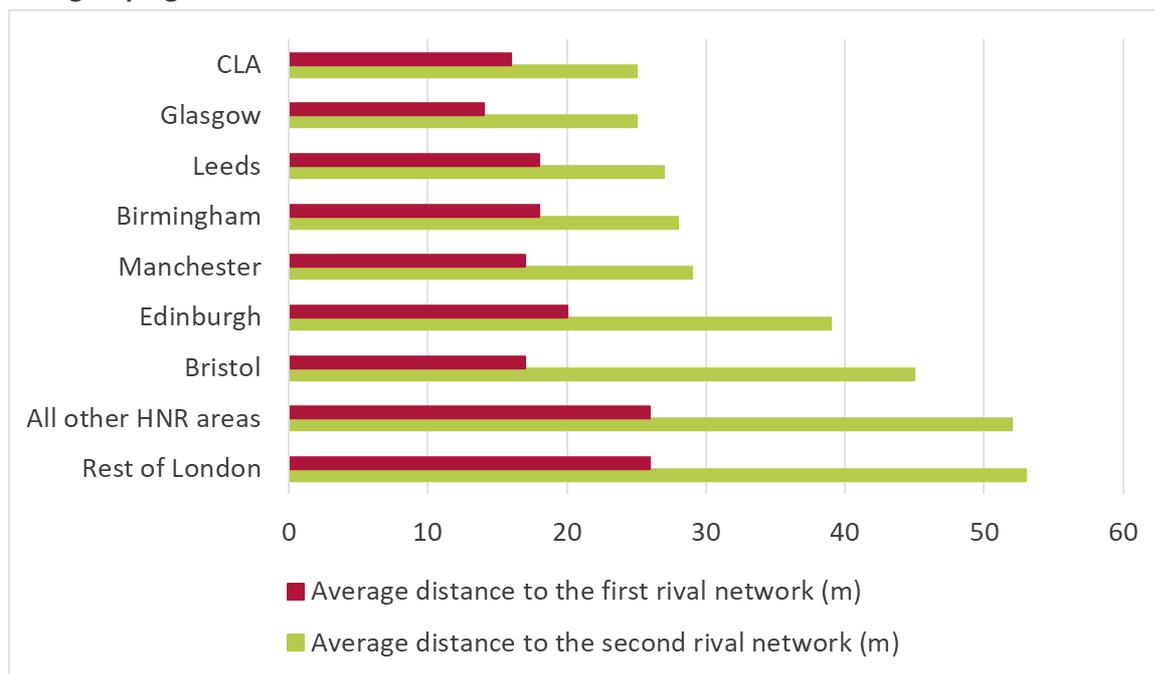
5.40 Figure 5.5 shows the number of rival networks within 50m of the average business site in each of the city clusters and all other HNR areas, while Figure 5.6 shows the average distance of rival networks to customers connected in 2017 in those areas.

Figure 5.5: Average number of rival networks within 50m of a large business site in HNR area groupings



Source: Ofcom network reach analysis

**Figure 5.6: Average distance of the closest rival networks to customers connected in 2017 in HNR area groupings**



Source: Ofcom network reach analysis

**Proposal that the Central London Area constitutes a distinct geographic market**

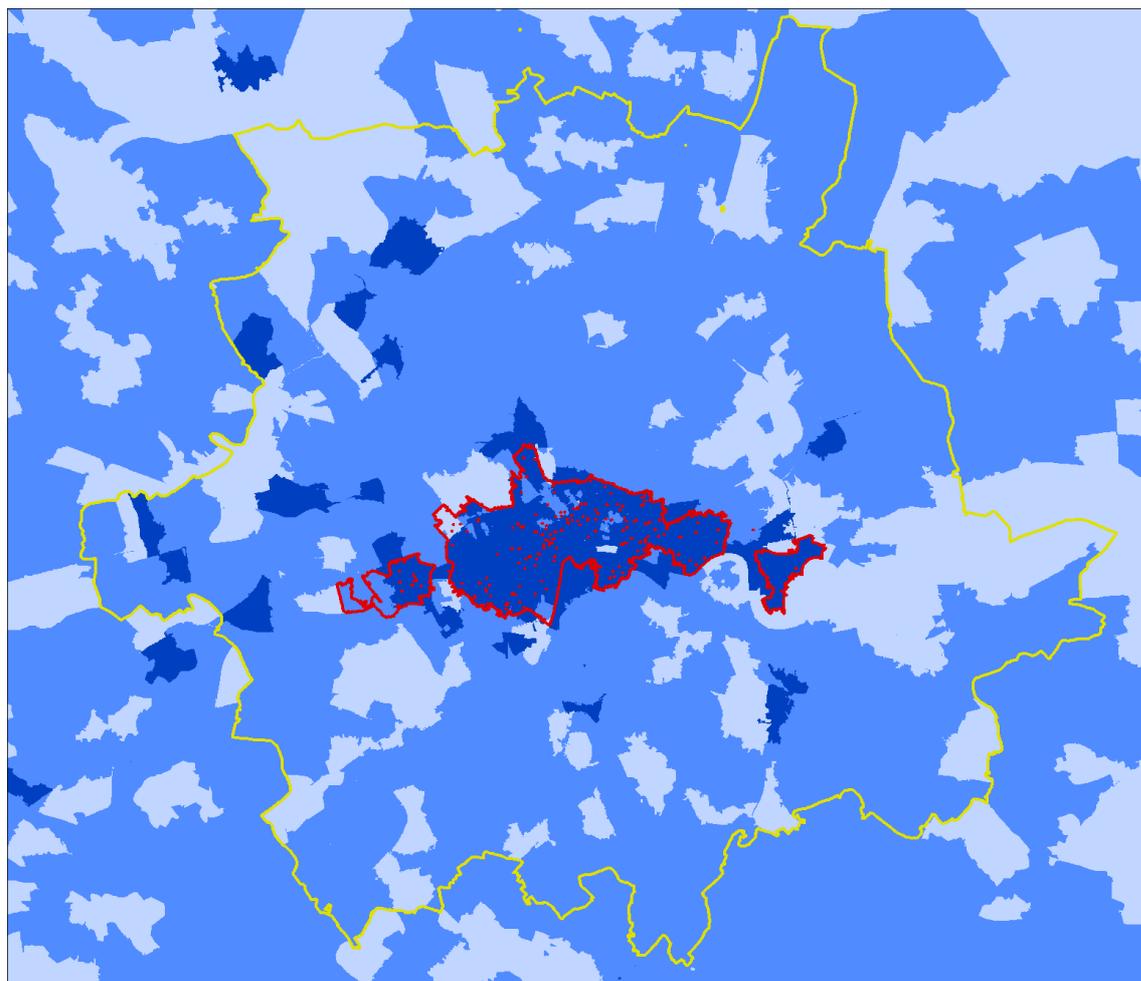
5.41 Figure 5.7 presents a map of London<sup>104</sup> showing the CLA boundary in red (as defined in the 2016 BCMR). The CLA is predominantly made up of HNR postcode sectors (258 postcode sectors). There are also 18 postcode sectors in the CLA that are classified as BT Only (three postcode sectors) or BT+1 (15 postcode sectors) which are contiguous to and/or in some cases surrounded by HNR postcode sectors.<sup>105</sup>

5.42 In the rest of London (i.e. those postcode sectors outside of the red boundary forming the CLA), our analysis indicates that there are 37 HNR postcode sectors, which are scattered across the rest of London. Of those, 17 postcode sectors are contiguous to the CLA boundary.<sup>106</sup>

<sup>104</sup> We have calculated London based on postcodes beginning with N, S, E and W.

<sup>105</sup> These are: EC1A 1, EC1A 7, EC2Y 8, EC4M 8, EC4V 3, NW1 2, NW1 5, SW1P 4, W14 8, W1H 5, W1U 8, W2 1, W6 7, WC1B 3, WC1H 9, WC1N 1, WC1N 3 and WC1X 0.

<sup>106</sup> These are: E1 5, E14 6, E14 8, E1W 1, N1 9, NW1 8, NW1 9, NW5 2, SE1 2, SE1 7, SE1 8, SW1V 2, SW3 6, SW7 3, SW7 4, W11 2 and W11 3.

**Figure 5.7: Map of network reach in the CLA and rest of London**

Source: Ofcom network reach analysis

5.43 As part of our assessment of whether particular HNR areas may constitute separate geographic markets, we have examined all HNR areas in London (including those within the existing CLA) to assess whether competitive conditions are sufficiently homogeneous with other HNR areas in the UK. In assessing this:

- we consider whether competitive conditions are sufficiently homogeneous between the HNR areas in each of the following: CLA, rest of London and other areas in the UK; and
- we look in more detail at competitive conditions in a subset of the HNR postcode sectors in the rest of London, namely those that are outside the CLA but are contiguous to the CLA boundary.

5.44 The results are summarised in Table 5.8.

**Table 5.8: Comparison of HNR areas in each of the CLA, rest of London, postcode sectors contiguous to the CLA and other areas in the UK**

	HNR in CLA	HNR in London outside CLA **	17 HNR postcode sectors adjacent to CLA boundary	All other HNR areas
Average number of rival networks within 50m*	4.3	2.2	2.3	2.3
Average distance of customers connected in 2017 to:				
Closest rival network	16m	26m	21m	21m
2 <sup>nd</sup> closest rival network	26m	53m	57m	40m
3 <sup>rd</sup> closest rival network	34m	124m	91m	98m
4 <sup>th</sup> closest rival network	47m	251m	124m	269m

Source: Ofcom Network Reach Analysis

\*Defined as the average number of rival networks within 50m buffer distance of large business sites

\*\*HNR in London outside CLA includes the 17 HNR postcode sectors adjacent to the CLA boundary.

- 5.45 First, the results show that competitive conditions within HNR areas in the CLA are sufficiently different from those in other HNR areas to constitute a separate geographic market. This is based on the markedly greater network presence in HNR areas in the CLA:
- in the HNR areas in the CLA, the average business site has between four and five rival networks within 50m, compared with two to three rival networks within 50m in HNR postcodes in the rest of London and in other HNR areas in the UK; and
  - proximity to rival networks in the HNR areas in the CLA is materially higher than in HNR postcode sectors in the rest of London and HNR areas in the UK.
- 5.46 Second, results show that HNR postcode sectors in the rest of London (i.e. outside the CLA) are not sufficiently distinct from HNR areas in the rest of the UK to constitute a separate geographic market. Therefore, we consider these together with HNR areas in the rest of the UK.
- 5.47 Third, results for the 17 HNR postcode sectors contiguous to the CLA still are sufficiently distinct from HNR areas in the CLA and are more similar to other HNR areas in the UK. As a result, our provisional view is that it is appropriate to consider them together with HNR areas in the rest of the UK rather than to expand the boundary of the CLA.
- 5.48 Finally, we have considered whether to include the 18 postcode sectors now classified by our network reach analysis as BT Only or BT+1 in the same market for the HNR postcode sectors in the CLA (i.e. define a single market for the CLA). We propose to continue to include them in the CLA to ensure regulatory consistency, as the CLA has been deregulated in previous market reviews. We do not think it is appropriate to risk re-regulating these postcode sectors and then deregulating them again in the future, particularly in light of the following considerations:

- they are all contiguous to or even surrounded by HNR postcode sectors. We therefore consider there is potential for incremental network build into these sectors. This is supported by the evidence on the average distance to the nearest rivals in these 18 postcode sectors collectively. On average, the four nearest rivals are 24m, 46m, 63m and 78m away from customers connected in 2017.<sup>107</sup> While, on average, rival proximity is lower than the HNR sectors in the CLA, it is greater than the proximity to rival networks in HNR areas in the rest of London or in other areas of the UK (particularly for the third and fourth nearest rival networks);
- the low network reach result may be an anomaly as some of these postcode sectors are located in the heart of the CLA and the underlying dataset indicates a low number of business sites in some of those postcode sectors. This is further supported by the evidence on the distance to nearest rivals discussed above; and
- The number of postcode sectors is small, so will not have a material effect on our analysis and findings for the CI access market.<sup>108</sup> We consider it appropriate and practical for these postcode sectors to remain in the existing CLA.

### **Proposal that HNR areas in each of Birmingham, Bristol, Edinburgh, Glasgow, Leeds, Manchester and the Rest of the UK constitute separate geographic markets**

- 5.49 In relation to the other metropolitan areas, we find that the evidence is mixed. As shown in Table 5.9, each of these city clusters has between two and three networks within 50m of the average business, which is marginally higher than in HNR areas in the rest of the UK. However, each of the city clusters has a first and a second rival operator located somewhat closer than in the other HNR areas in the rest of the UK, though this is most pronounced in Glasgow.<sup>109</sup>
- 5.50 The decision as to whether competitive conditions are sufficiently homogeneous inevitably involves a degree of judgement. In the case of the CLA, it is clear that there is significantly greater presence of rival networks than in other HNR areas. The distinction between the metropolitan areas and the HNR areas in the rest of the UK is less clear-cut as in some measures (number of rival networks) they appear reasonably similar to each other and to other HNR areas in the rest of the UK, though there are some differences (proximity of those rival networks to businesses), and some differences between different metropolitan areas.

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<sup>107</sup> While more than 65% of the business sites in these 18 postcode sectors are within coverage of zero or one rival network, the average distance of the second nearest rival to customers connected in 2017 is less than 50m.

<sup>108</sup> We do not consider that this will have a material impact on our SMP analysis and findings for the CLA. They are a small proportion of the postcode sectors in the CLA (around 6%) and hence will not have a significant impact on the results we get for the CLA in the SMP analysis.

<sup>109</sup> We have also undertaken a sensitivity as to whether there are sub-clusters of greater network competition within these HNR areas, which may be more similar to the CLA. We report this result in Annex 13. In summary, we find that the only metropolitan areas with a material number of clusters with three or more operators within 50m are in Manchester and Glasgow. However, we note that BT's share is the same in BT+3 areas as in BT+2, suggesting that our SMP assessment would be unchanged if we were to use a higher network reach threshold.

5.51 On balance, we have decided to adopt a conservative approach and to treat each of these metropolitan areas as a separate geographic market, distinct from both the CLA and from the HNR areas in the rest of the UK.

**Table 5.9: HNR areas in the CLA, top six metropolitan areas and the rest of the UK excluding the Hull Area**

Area	Number (share*) of postcode sectors	Number (share*) of customer ends connected in 2017	Average distance (m) of customers connected in 2017 to			Average network reach**
			Closest rival network	2 <sup>nd</sup> closest rival network	3 <sup>rd</sup> closest rival network	
CLA	258 (45%)	7,355 (65%)	16	26	34	4.3
Edinburgh	20 (3%)	443 (4%)	20	39	135	2.3
Manchester	33 (6%)	439 (4%)	17	29	56	2.7
Glasgow	19 (3%)	402 (3%)	14	25	56	2.5
Leeds	14 (2%)	300 (3%)	18	27	42	2.7
Bristol	10 (2%)	268 (2%)	17	45	65	2.8
Birmingham	9 (2%)	230 (2%)	18	28	52	2.6
Rest of the UK excl. the Hull Area	213 (37%)	1,958 (17%)	26	52	134	2.1

Source: Ofcom network reach and circuit data analysis

\*Percentages presented in this table may not add up to exactly 100% due to rounding.

\*\*Defined as the average number of rival networks within 50m buffer distance of large business sites

## Proposed geographic markets for CI Access Services

5.52 We therefore propose to define the following geographic markets for CI Access services:

- BT Only areas;
- BT+1 areas;
- the Central London Area;
- HNR areas of each of Birmingham, Bristol, Edinburgh, Glasgow, Leeds and Manchester (Metro Areas);
- all other HNR areas (taken together); and
- the Hull Area.

5.53 A list of postcode sectors constituting the above geographic markets is provided in Schedule 5 of the draft Legal instruments. It is based on postcode sectors contained in the postcode dataset used in our analysis. For postcode sectors not captured in this data set, such as new postcode sectors created in the future, we propose to apply the following rules:

- postcode sectors overlapping in whole or in part with those classified as the Central London Area shall also be considered part of the Central London Area;
- postcode sectors overlapping in whole or in part with those classified as the Hull Area shall also be considered part of the Hull Area;

- postcode sectors overlapping in whole or in part with those classified as Metro Areas shall also be considered part of the Metro Area they overlap with;
- postcode sectors that cannot be classified based on the above and overlap in whole or in part with those classified as HNR areas shall also be considered a HNR area;
- postcode sectors that cannot be classified based on the above and overlap in whole or in part with those classified as BT+1 areas shall also be considered a BT+1 area; and
- all other postcode sectors shall be considered a BT Only area.

## Consultation questions

Question 5.1: Do you agree with our proposed approach to geographic market analysis for CI Access? Please provide evidence to support your views.

Question 5.2: Do you agree with our proposed definition of geographic markets for CI Access? Please provide evidence to support your views.

## 6. CI Access: SMP findings

- 6.1 This section presents our proposed market power assessment for the relevant product and geographic markets defined in Sections 4 and 5. Specifically, we examine whether any provider has significant market power (SMP) in the supply of CI Access services in each of the geographic markets defined in the UK outside the Hull Area.<sup>110</sup>
- 6.2 We provisionally conclude that BT has SMP in the supply of CI Access services in the whole of the UK, except for the Central London Area (CLA) and the Hull Area. That is, we propose to find SMP in the following geographic markets:
- BT Only areas in the UK;
  - BT+1 areas in the UK;
  - each of the Metro Areas;<sup>111</sup> and
  - HNR areas in the rest of the UK.<sup>112</sup>
- 6.3 The CLA is different from other geographic markets because sufficient infrastructure has been deployed to exert strong competitive constraints on BT.
- 6.4 For completeness we have conducted a separate SMP assessment looking at a hypothetical market for VHB services, which is set out in Annex 14. We provisionally conclude that even if VHB circuits were in a separate product market, we would find BT had SMP in VHB circuits in the whole of the UK except the CLA and Hull Area.
- 6.5 We set out our proposed analysis and findings for the CI Access markets in the following order:
- we explain our proposed approach to SMP assessment;
  - we set out the proposed SMP assessment for each geographic market;
  - we summarise our provisional conclusions on SMP for CI Access services in the relevant geographic markets.

### Proposed approach to SMP assessment

- 6.6 SMP is defined in the Act as being equivalent to the competition law concept of dominance, that is, a position of economic strength affording a telecoms provider the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers.

### Our assessment is forward-looking

- 6.7 We conduct an SMP assessment for each relevant market to see whether or not *ex ante* regulation is necessary over the timeframe of this review. Hence, our SMP assessment is forward-looking and considers whether markets could be prospectively competitive and

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<sup>110</sup> The SMP assessment for CI Access services in the Hull Area is set out separately in Section 9.

<sup>111</sup> Defined as HNR postcode sectors in each of Birmingham, Bristol, Edinburgh, Glasgow, Leeds and Manchester.

<sup>112</sup> Defined as HNR postcode sectors outside the CLA, Metro Areas and the Hull Area.

thus whether any lack of competition may be temporary. We take into account expected or foreseeable market developments over this market review period.

6.8 As set out in Section 2, this market review covers the period to 31 March 2021.

## We adopt a Modified Greenfield Approach

6.9 Similar to our market definition analysis, we apply the Modified Greenfield Approach. The SMP assessment assumes that there is no *ex ante* regulation arising from a finding of SMP within the relevant market in question.

## We consider evidence on different SMP criteria in the round

6.10 The EC SMP Guidelines set out a non-exhaustive list of criteria to be considered in an SMP assessment, and state that a dominant position may derive from a combination of these criteria, which taken separately may not necessarily be determinative.<sup>113</sup> Evidence on the most relevant SMP criteria should be considered in the round, and findings should not be based on assessment of a single criterion.

6.11 In our assessment of competition in the relevant market, we have had regard to the criteria for assessing SMP set out in the EC SMP Guidelines. We consider that the following criteria are particularly relevant to the assessment of SMP in CI Access markets:

- market shares and market share trends;
- control of infrastructure not easily duplicated;
- economies of scale and scope;
- barriers to entry and expansion;
- absence of potential competition; and
- absence of or low countervailing buyer power.

6.12 We set out our approach to assessing each criterion in turn.

## Market shares

### Role of service shares

6.13 The EC SMP Guidelines note that when considering the market power of an undertaking it is important to consider market shares.<sup>114</sup> Market shares – and trends in market shares – are a measure of the outcome of competition, and as such, can provide an indication of how competitive a market has been in the past, and is now. Where an undertaking has a persistently large market share, this usually points to impediments to effective competition being present. Where impediments, as in many cases, do not change over time, market shares can be a good indicator of competitive conditions in the future.

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<sup>113</sup> EC SMP Guidelines, paragraph 58.

<sup>114</sup> EC SMP Guidelines, paragraph 54.

- 6.14 In this respect, we regard the following from the EC SMP Guidelines of particular relevance:<sup>115</sup>
- very large market shares in excess of 50% are in themselves evidence of a dominant position, save in exceptional circumstances;
  - dominance concerns can also arise at lower shares depending on the difference between the market shares of the undertaking in question and that of its competitors; and
  - if market share is high but below the 50% threshold, NRAs should rely on other key structural market features to assess SMP.<sup>116</sup>

### **We present service shares based on new customer ends connected in 2017**

- 6.15 We present service shares for BT and rival operators for each geographic market. Broadly, the greater the number of rivals that have managed to attain a material share of supply, the stronger is the indication that the intensity of competition is greater.
- 6.16 Our analysis is based on the data obtained using our statutory information gathering powers from operators on the new connections they sold in 2017.<sup>117</sup> We estimate service shares based on the new CI customer ends connected in 2017 and our approach is explained in Annex 12.<sup>118</sup> For brevity, we refer to this as ‘2017 new customer ends’ when presenting the results in this section. The data include connections provided to new customers including circuits provided when customers upgrade their bandwidth requirement.
- 6.17 We consider service shares of 2017 new customer ends to be a reasonable measure for a forward-looking assessment of SMP. While circuit inventory may be a more complete measure of past competitive conditions, new connections focus on the most recent activity and so are likely to better reflect future market dynamics. The number of 2017 new customer ends is large enough to provide meaningful service shares across the different geographic markets. The data contains around 63k customer ends in the UK excluding the Hull Area, the majority of which are in BT Only and BT+1 areas. The CLA, the Metro Areas combined and HNR areas in the rest of the UK each have more than 1,000 customer ends. This is a large enough sample to produce statistically robust results.<sup>119</sup>

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<sup>115</sup> EC SMP Guidelines, paragraphs 53-57.

<sup>116</sup> The EC SMP Guidelines state that the European Commission’s experience is that market shares less than 40% means that dominance is not likely. Footnote 55.

<sup>117</sup> Telecoms providers’ responses to the 1<sup>st</sup> s.135 notice. The data includes detailed information for each new connection such as the location of both ends of the circuit, interface and bandwidth sold and whether the circuit was provided on-net or off-net. Annex 12 describes the data gathered and the data cleaning process undertaken to calculate the service shares.

<sup>118</sup> Customer ends refer to leased lines circuit ends terminating at customer premises.

<sup>119</sup> The number of 2017 new customer ends in each of the Metro Areas is between 230 and 439 ends. We consider that results are reliable, particularly that they are broadly consistent across Metro Areas and Openreach’s service shares are above 50% (i.e. our finding will not be sensitive to small changes in service share results).

- 6.18 We cannot present reliable estimates of service shares and service share trends based on circuit inventory due to data limitations. We obtained this data from operators using our statutory information gathering powers. However, when reviewing it, we have found serious issues with Virgin Media’s inventory data that have rendered some of its data unreliable (explained in Annex 12).<sup>120</sup> As the second largest infrastructure network in the UK after BT, Virgin Media’s data is key to our ability to reliably estimate service shares.
- 6.19 Notwithstanding this, we consider that service shares based on 2017 new customer ends (i.e. new connections) are a good proxy for shares based on circuit inventory data. Shares of 2017 new connections are likely to be closely related to shares based on the total volume of circuits inventory, as they include upgrades and circuits are upgraded on a regular basis. Our analysis of Openreach’s data indicates that new connections make up [X]% 21-30% of the total volume of actively provided circuits as of December 2017.<sup>121</sup>
- 6.20 We recognise the risk that new connections may be a less reliable indicator of market power if certain operators have carried out an abnormal volume of activity in 2017. However, from our discussions with stakeholders we have no reason to believe that this is the case.
- 6.21 Notwithstanding our reservations on circuit inventory data, we also present inventory service shares as a sensitivity. Even though they are likely to understate BT’s service shares, BT’s service share in each geographic market defined is consistent with an SMP finding.<sup>122</sup>

## Control of infrastructure not easily duplicated

### BT has a significant advantage from being closer to customer sites

- 6.22 BT has by far the largest and the only ubiquitous network in the UK. Virgin Media owns and operates the largest physical network out of BT’s rivals. Other operators have built fibre networks to gain some coverage of business areas (e.g. Vodafone, Colt, Level 3, CityFibre and Zayo). These networks have typically been built in areas with high densities of potential business users (most notably in central London but also in some other large cities) and on aggregated trunk routes between major population centres (see Section 5).

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<sup>120</sup> The issues identified also applied to the Virgin Media circuit inventory data we used to estimate service shares for 2016 BCMR. We consider that the issues with the data and how we adjusted for missing data in our previously review are likely to have contributed to overstating Virgin Media’s service share and consequently understating that of BT, particularly for VHB services where circuit volumes are small. See Annex 12 for more details.

<sup>121</sup> Openreach’s response to 1<sup>st</sup> BCMR s.135 notice dated 18 January 2018.

<sup>122</sup> Virgin Media’s service shares are likely to be overstated for the following reasons. First, Virgin Media inventory data could overstate the number of circuit ends because it may include inactive circuits and the same circuit may be included more than once. Second, a large proportion of the inventory data has missing information for key variables. Notably, for [X]% 30-40% of Virgin Media’s circuit ends classified as CI Access there is no information on whether it supplied the circuit using its own network (on-net) or by purchasing a wholesale product from a third party (off-net). For circuit ends with missing on-net classification, we followed a conservative approach and included them in our service share analysis, which will further overestimate Virgin Media’s service shares.

- 6.23 BT's ubiquitous network gives it an advantage over other operators as it will more often have a physical infrastructure connection (fibre or duct) to customer sites. Our analysis shows that BT had existing duct connections to [Redacted] 81-90% of its 2017 new customer ends in the UK excluding the Hull Area, compared to 45% across all rivals, collectively.<sup>123</sup> We note that [Redacted]% of BT's 2017 new customer ends were fibre connected compared to less than 45% for rivals (we were unable to estimate the exact figure for rivals due to data limitations).
- 6.24 BT has a significant cost advantage when it is fibre or duct connected while rivals are not. If BT has an existing fibre connection to the customer, the incremental infrastructure cost of connecting to that customer is negligible. If BT only has a duct connection, it will incur a relatively low incremental cost when it provides new fibre connections, often by laying fibre in duct which already reaches the customer site. The incremental cost will vary depending on whether the telecoms provider just needs to blow fibre through the duct or also needs to add fibre tubing. On the other hand, rivals will incur significant additional costs, even if they need to dig short distances.<sup>124</sup>
- 6.25 We assess the scale of this advantage by comparing the cost of physically connecting a customer under different scenarios.<sup>125</sup> Our analysis is set out in detail in Annex 10. The analysis is based on Openreach's costs for the physical infrastructure required to extend its network.<sup>126</sup> When a provider is duct connected, the incremental cost will vary depending on whether the telecoms provider has fibre tubing. When the provider has no physical connection to the site and needs to extend its network, the main incremental costs will be digging to install duct in the ground. The results are summarised in Figure 6.1.

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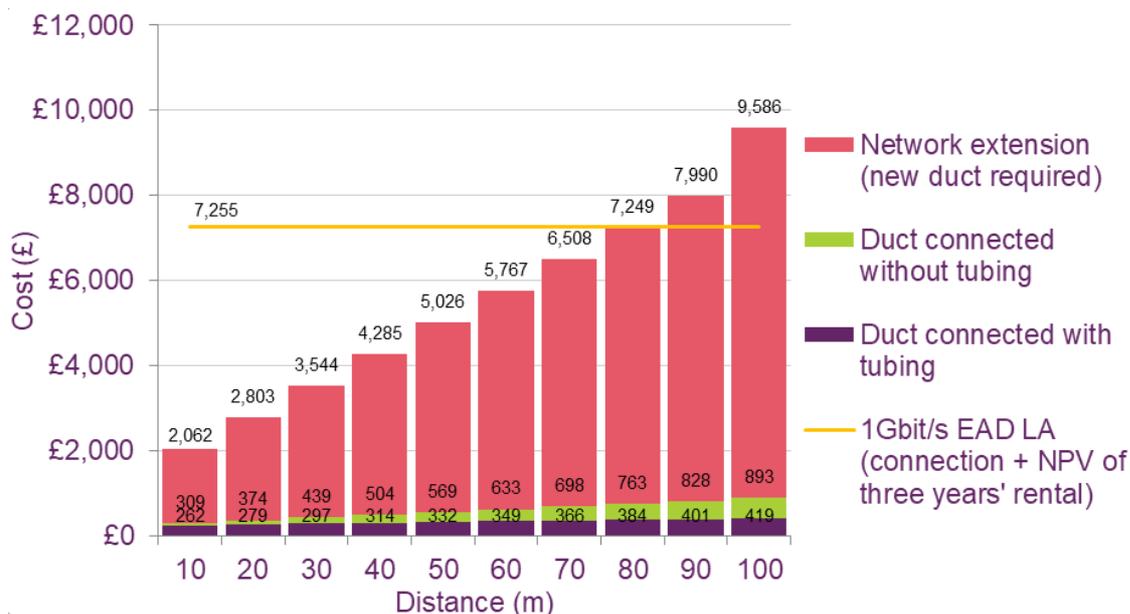
<sup>123</sup> The analysis and findings are set out in Annex 11.

<sup>124</sup> Even if all operators are not duct connected (including BT), BT may still get a cost advantage if it is closer to the customer site due to lower costs of network extensions.

<sup>125</sup> This excludes equipment costs as it does not affect our analysis.

<sup>126</sup> We recognise that rivals' costs may be different from Openreach's (they are likely to be higher e.g. as Openreach may benefit from bulk discounts). However, we consider that Openreach's costs are a reasonable proxy for rivals' costs for this analysis. This is because we are interested in the scale of costs incurred for network extensions rather than a precise quantification of that cost.

Figure 6.1: Infrastructure costs for different proximity scenarios



Source: Ofcom analysis. Physical infrastructure costs are based on Openreach’s ECCs and price of 1 Gbit/s EAD LA is based on Openreach’s list price as of 1 April 2018.<sup>127</sup>

6.26 These results show that BT will have a significant cost advantage even at short dig distances. We estimate that for a network extension of 10m BT will have a cost advantage of approximately £1,800.<sup>128</sup> This cost advantage is around one-quarter the revenue of a three-year contract for a 1 Git/s EAD LA circuit (£7,255).<sup>129</sup> The scale of the advantage increases with the length of network extension (e.g. 1km network extensions cost around £84,000 compared to around £7,000 if the provider is duct connected with no fibre tubing). BT’s advantage will also be higher when it has an existing fibre connection to the customer site as it will incur minimal cost (as set out above, [Redacted]).

6.27 In addition to this cost advantage, BT will also be better placed to compete due to customer convenience. When BT is fibre connected it can readily serve the customer. Where it is duct connected the time taken to supply a customer will by much shorter compared to the time taken if network extension is required. As mentioned in Section 4,

<sup>127</sup> We include ECCs on survey, blown fibre tubing, blown fibre, digging a duct under a footway, digging a duct under a carriage way, new footway box, break through external wall(s) at the customer premises. See Annex 10 for more details.  
<sup>128</sup> This is calculated by comparing a cost of £262 for BT (as it is usually duct connected with tubing) vs. a cost of £2,062 for a rival, which would probably need to extend its network to reach the customer.  
<sup>129</sup> Ofcom analysis based on Openreach prices for EAD Local Access as of April 2018 (where £7,255 = £1,875 connection + £5,380 NPV rental over three years). Rental charges have been discounted using a 9% factor. We acknowledge that Openreach reduced the prices of 1 Gbit/s rental charges as of 1 October 2018, which will further increase the scale of its advantage.

digging increases the time to supply a customer, hence, networks which are further away from the customer site are at a disadvantage to BT.<sup>130</sup>

6.28 This is supported by the evidence set out in Annex 11. In summary, evidence shows that:

- on average, duct activity can increase the time to supply a leased line to 178 working days. This is significantly longer than the mean time to provide for all orders (56 working days on average), and for fibre-connected orders (12 working days on average);<sup>131</sup> and
- leased line users consider lead times and certainty about delivery dates an important factor when choosing a supplier. The BDRC 2016 study found that a majority of respondents (51%) choose their existing supplier because they are already connected to its network.<sup>132</sup> It also found that for respondents who said that they experienced problems when migrating to an alternative service, the most frequent obstacle was time taken to deliver service/long delay in installation. This is consistent with the results from the Cartesian 2018 study which indicate that service delays are the key problem facing leased line customers.<sup>133</sup>

#### **Infrastructure indicators used to assess proximity of rival infrastructure to customer sites<sup>134</sup>**

6.29 The magnitude of BT's competitive advantage and the strength of competition it faces in a given area will depend on the proximity of rival networks to customer sites. Therefore, we consider four infrastructure indicators in the SMP assessment:

- *average number of rivals within 50m of business sites (network reach)*: As set out in Section 5, this provides a useful indication of the degree of rival infrastructure available close to customer sites in a particular geographic area, and hence is a good starting point for assessing areas with existing or potential for infrastructure-based competition.<sup>135</sup> It calculates, for each postcode sector in the UK, the number of operators other than BT that have network within a certain distance of the business sites in that postcode sector;
- *proportion of businesses with X rival networks within 50m*: Network Reach captures the average degree of choice across an area. Looking at the proportion of business sites

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<sup>130</sup> The competitive advantage due to customer inconvenience is less clear cut when all suppliers are not connected. The time to supply is not necessarily proportionate to the dig distance required.

<sup>131</sup> This evidence is based on information about the time it takes Openreach to provide different types of leased line Ethernet orders (all orders, orders with duct work, and quick wins), and the relationship between time-to-provide and dig distance. We collected this information from Openreach via our s.135 powers (see Annex 11 for further details).

<sup>132</sup> 2016 BDRC study, Figures 23 and 24.

<sup>133</sup> 2016 BDRC study, Figure 32.

<sup>134</sup> All distances measured by the infrastructure indicators are radial distances. In particular, Annex 12 sets out how we measure the distances used in the Network Reach analysis and distance to nearest rivals and the Annex 11 sets our analysis of distances dug by telecoms providers in 2017.

<sup>135</sup> For more details on the assumptions and calculations underlying the network reach analysis see Section 5 and Annex 12.

within an area that are covered by a specified number of rival networks is one means of adding depth to the analysis;

- *proportion of 2017 new customer ends with existing duct connections*: The intensity of competition will vary depending on the extent to which BT already have existing duct to customer sites compared to its rivals. For each operator, we estimate the proportion of 2017 new customer ends where which were provided on-net (i.e. using their own network) without undertaking any duct work. The analysis is set out in detail in Annex 11;<sup>136</sup> and
- *average distance from business sites to nearest rivals*. Where rivals are not connected, the intensity of competition not only depends on the number of rival networks within 50m, but also on how close they are to the customer site. Therefore, looking at how close rivals are to average business sites adds depth to our assessment.

### Our interpretation of the infrastructure indicators

- 6.30 The infrastructure indicators inform our views on the strength of competition from providers with network sufficiently close to a customer’s site. Each indicator provides a useful means of summarising the degree of rival infrastructure in a particular area but, it does not give a comprehensive picture of the extent of rival network coverage on its own.
- 6.31 We consider that 50m is a useful indicator for identifying the potential for competition from local rival networks in CI Access services. However, not all suppliers with networks located within this distance would be equally able to compete with BT. As explained earlier in this section, suppliers within this distance may still be at a material competitive disadvantage to BT if their network is located further away from the customer while BT has an existing connection.
- 6.32 In addition, it is necessary that BT faces competition for most customers in a given geographic market for it to be effectively competitive. One reason is that, in an unregulated market, there would be scope for a telecoms provider with SMP to exploit pockets of market power through bespoke pricing.
- 6.33 Finally, a greater number of proximate rival networks is likely to lead to a greater degree of competitive constraint on BT. Our view is that fewer than two rivals is insufficient to act as a potentially effective competitive constraint on BT.

### Sensitivity analysis

- 6.34 As set out in Section 5, we have carried out sensitivity analysis on the assumptions for the different parameters used in the network reach analysis in Annex 13.<sup>137</sup> We find that changes in these parameters would not have a material impact on our SMP findings.

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<sup>136</sup> Our analysis is based on the 2017 data for new connections of CI Access obtained from telecoms providers in responses to the 1<sup>st</sup> BCMR s.135 notice.

<sup>137</sup> For example, we carried out sensitivity analysis on the buffer distance and the network reach coverage threshold.

## Economies of scale and scope<sup>138</sup>

- 6.35 A large proportion of costs associated with providing leased lines are incurred in developing (and maintaining) the part of the infrastructure that connects to sites, i.e. access links. Some of these costs will only be incremental to the individual site (final lead-in duct), while others can be shared among several sites in the same area (distribution and spine ducts).<sup>139</sup>
- 6.36 Against this backdrop, economies of scale and scope may strengthen BT’s advantage from its ubiquitous network. The presence of high fixed costs can give rise to economies of scale because average fixed costs necessarily fall as volumes of a service increase. The presence of common costs can give rise to economies of scope with the average fixed cost decreasing in the total volumes of services in the group supplied.
- 6.37 The materiality of BT’s advantage from economies of scale and scope in a given geographic market will depend on the extent to which rivals in a given area use their networks to serve a broadly similar scale of leased line customers (economies of scale) or residential broadband customers (economies of scope). We recognise the importance of economies of scope and, as set out in Section 1, we want to enable more fibre investment by alternative network operators and Openreach alike to deliver multi-service networks.

## Barriers to entry and expansion and absence of potential competition

- 6.38 We consider that an incumbent operator can maintain its strong position in the market if there are high barriers to entry and limited prospects for potential competition.
- 6.39 The EC SMP Guidelines mentions that “an SMP finding depends on an assessment of the ease of market entry”.<sup>140</sup> We consider the following factors particularly relevant to our assessment:
- the existence of high sunk costs. This is consistent with the OFT’s guidelines on the assessment of market power, which explains that:
    - “Sunk costs might give an incumbent a strategic advantage over potential entrants. Suppose an incumbent has already made sunk investments necessary to produce in a market while an otherwise identical new entrant has not. In this case, even if the incumbent charges a price at which entry would be profitable (if the price remained the same following entry), entry may not occur. This would be the case if

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<sup>138</sup> We define economies of scale (or increasing returns to scale) as circumstances in which the unit cost falls as volumes of the same service increase, and economies of scope as circumstances where the unit cost falls as volumes of a different service increase.

<sup>139</sup> Distribution/spine networks provide duct coverage in a local area, typically running past customer sites in anticipation of future connections. Lead in ducts provide the final link between the customer building and the distribution/spine network.

<sup>140</sup> EC SMP Guidelines, paragraph 59.

the entrant does not expect the post-entry price to be high enough to justify incurring the sunk costs of entry”;<sup>141</sup>

- high switching costs: Existing customers may incur – or anticipate incurring – costs when switching to another supplier, which they would not incur when continuing to purchase from their current supplier. This will hinder the ability of rivals to compete for existing customers; and
- BT’s network footprint: We assess whether BT’s national coverage, due to its ubiquitous network, is likely to raise significant impediments to its rivals when competing for multi-site contracts. We also consider whether any other advantages may arise from BT’s ubiquitous network.

6.40 We assess the prospects for potential competition by reviewing evidence on potential network expansion by telecoms providers. Competition is more likely to increase where there have been actual announcements of plans to enter and/or expand by rivals. We asked fixed operators to tell us about their future investment plans using our statutory information gathering powers.<sup>142</sup>

6.41 We consider that network expansion plans over the market review period (i.e. until 2021) are relevant to our SMP assessment.

### Countervailing buyer power

6.42 We consider that customers would have a degree of buyer power where they purchase large volumes and have a credible threat to switch supplier or to meet requirements through self-supply. CI Access customers may have sufficient countervailing buyer power if there is availability of another source of supply (another supplier or self-supply) and their purchase volumes are material. Both of these requirements need to be met cumulatively.

### Proposed finding that BT has SMP in BT Only and BT+1 areas

6.43 We have considered whether BT has SMP in BT Only and BT+1 areas. The BT Only market is made up of postcode sectors where less than 65% of large business sites have a rival network to BT within 50m. BT+1 is made up of postcode sectors where more than 65% of large business sites have only one rival network to BT within 50m. To avoid repetition we discuss both markets together. However, we present results for each market separately.

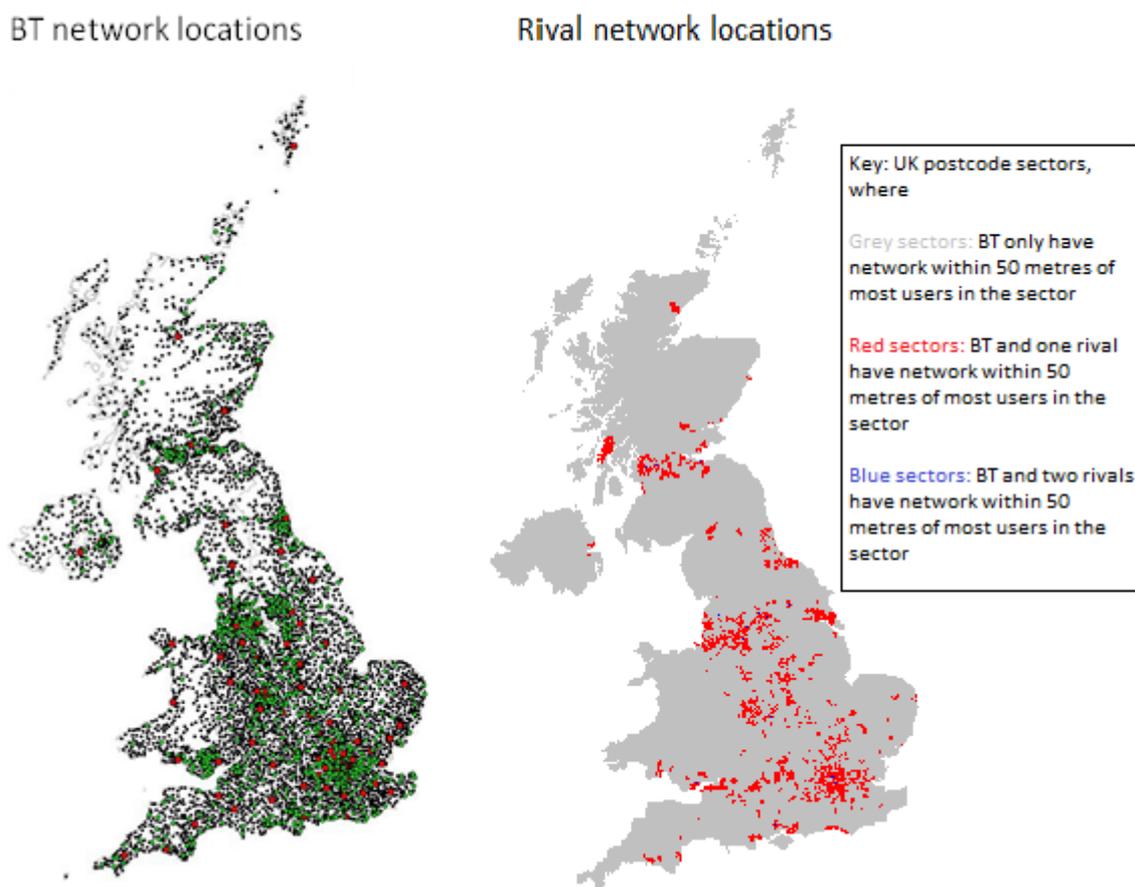
6.44 Figure 6.2 shows the locations of BT Only and BT+1 postcode sectors. It maps BT’s network locations across the UK (on the left) to rivals’ network presence (on the right), which is based on the network reach results. This shows that BT has an extensive network of ducts across the UK, while rival infrastructure is patchy and concentrated around some geographic areas.

<sup>141</sup> OFT, 2004. *Assessment of market power* (OFT 415), paragraph 5.10.

<https://www.gov.uk/government/publications/assessment-of-market-power> [accessed 30 October 2018].

<sup>142</sup> Question C3 in the 1<sup>st</sup> BCMR s.135 notice.

Figure 6.2: BT and rival's network locations in the UK (excluding Hull Area)



Source: Ofcom analysis. BT's network locations from 2016 BCMR and include 5,600 local exchanges (black dots), 1,100 higher tier Access Serving Nodes (green dots), and 107 Openreach Handover Points (red dots). Rival network locations is based on Ofcom's network reach analysis (See Section 5 and Annex 12).

6.45 As set out in Section 5, the BT Only market accounts for over half of the postcode sectors in the UK (5,807 postcode sectors) and the BT+1 market accounts for a further one-third of postcode sectors in the UK (3,569 postcode sectors). We estimate that the BT Only market accounts for 48% of 2017 new customer ends (30k customer ends) and that BT+1 areas account for 34% of 2017 new customer ends (21k customer ends).

### Very high BT market share of 2017 new connections in both markets

6.46 BT has a very high share of 2017 new customer ends sold in BT Only and BT+1 markets. We estimate BT's share to be [Redacted] 81 - 90% and [Redacted] 61-70% respectively. The shares of its largest rival (Virgin Media) are materially lower, at [[Redacted] 11-20% and [[Redacted] 21-30% respectively.

6.47 This is broadly consistent with the sensitivity analysis we carried out by estimating service shares based on circuit inventories. Notwithstanding that our estimates are likely to materially understate BT's service shares and overestimate Virgin Media's shares, BT still has a high share of over 50% in BT Only and BT+1 markets ([Redacted] 71-80% and [Redacted] 51-

60% respectively), while Virgin Media’s share is materially lower, at [REDACTED]% 11-20% and [REDACTED]% 31-40% respectively.

6.48 According to the EC SMP Guidelines, a share in excess of 50% is itself evidence of a dominant position, save in exceptional circumstances.

## Limited presence of rival infrastructure

**Table 6.3: Infrastructure indicators in BT Only and BT+1 markets**

Infrastructure indicator		BT Only	BT+1
Average number of rival networks within 50m		0.3	1.0
Proportion of businesses with X rival networks within 50m <sup>143</sup>	X=0	77.7%	15.1%
	X=1	18.7%	70.1%
	X=2	2.9%	12.2%
	X=3	0.5%	2.1%
	X=4 or more	0.1%	0.5%
Average distance to the nearest three rival networks for 2017 connections	1 <sup>st</sup>	1.2km	63m
	2 <sup>nd</sup>	2.7km	0.35km
	3 <sup>rd</sup>	4.9km	0.88km
Openreach’s proportion of 2017 new customer ends already duct connected		[REDACTED] 81%-90%	[REDACTED] 81%-90%
Rivals’ breakdown of 2017 new customer ends <sup>144</sup>	<i>Customer ends</i>	[REDACTED]	[REDACTED]
	On-net duct connected	29%	51%
	On-net dig	4%	6%
	Off-net	65%	43%
Rivals’ build vs. buy <sup>145</sup>		6%	12%
Median radial distance dug in 2017 (m)	Openreach	[REDACTED] 0-25	[REDACTED] 0-25
	Rivals	18	14

Source: Ofcom’s network reach analysis and circuit data analysis. Annex 12 provides a more detailed description and explanation of the analysis undertaken.

6.49 Infrastructure indicators show that there is very limited rival infrastructure in the BT Only and BT+1 geographic markets. This supports the view that BT faces very limited infrastructure-based competition in those markets. The results are summarised in Table 6.3.

<sup>143</sup> Results may not add to 100% due to rounding

<sup>144</sup> ‘On-net duct connected’ is where a telecoms provider has existing duct in place to the customer site, but fibre may need to be installed. ‘On-net dig’ is where a telecoms provider extends their network by building new duct. ‘Off-net’ is where an active wholesale leased line product is purchased from another provider to reach the customer. Further information may be found in Annex 11.

<sup>145</sup> We determine rivals ‘build’ (on-net dig) as a percentage of rivals ‘build’ (on-net dig) plus rivals ‘buy’ (off-net) in relation to the supply of a leased line to a customer’s site outside their existing network reach. Further information may be found in Annex 11.

- 6.50 The table shows that, on average, there are less than two rivals within 50m of a business site in both markets. A small proportion of business sites have access to two or more rival networks within 50m (3.5% in BT Only and 14.8% in BT+1).
- 6.51 Our analysis suggests that rivals will usually need to dig very long distances to connect a customer site. Rivals, on average, had existing duct connections for a smaller proportion of customer ends they connected in 2017 compared to BT. In addition, rival networks are typically more than 50m away from a customer site. On average, the closest rival networks to a business site is more than 1km away in BT Only areas and 63m and 350m away in BT+1 area. Rivals are unlikely to dig such long distance due to the high cost of network extensions.<sup>146</sup>
- 6.52 This is supported by rivals' behaviour in 2017 in both markets. Rivals, on average, chose to build in less than 15% of their 2017 new customer ends where they did not already have an existing duct connection and the median distance dug was short (less than 25m).
- 6.53 We note that the proportion of Virgin Media's 2017 new customer ends with existing duct connections is significantly higher than the average across all rivals ([Redacted] 51-60% and 81-90% in BT Only and BT+1, respectively). This reflects that Virgin Media is the second largest provider with physical infrastructure network in the UK after BT; hence has existing duct connections to more premises compared to other rivals. It can also partially reflect that our calculation may overstate Virgin Media's estimates of duct connections.<sup>147</sup>
- 6.54 Our estimates suggest that Virgin Media's proportion of new customer ends with existing duct connections is not materially lower than BT in the BT+1 market. We do not consider that this undermines our view that BT has a competitive advantage from being closer to customer sites. Notwithstanding our concerns around potentially overstating Virgin Media's estimates, they are likely to reflect Virgin Media's incumbency advantage when competing for customers within their network reach rather than competing for new customer in locations that are not close to their network. This is supported by BT's ability to win a materially higher proportion of the 2017 new customer ends indicating BT's more extensive network (see service share analysis above). In addition, Virgin Media purchased a large proportion of their off-net sales in 2017 from BT, which further indicates BT's competitive advantage.
- 6.55 Second, even if we assume that Virgin Media's network was as extensive as BT in the BT+1 market, the potential for infrastructure competition from a single provider will not be sufficient to effectively constrain BT.

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<sup>146</sup> For example, a network extension of 1km costs £84,000 and for 60m costs around £6,000. (See Figure 6.1).

<sup>147</sup> Where a telecoms provider indicated that a circuit was provided on-net but did not indicate whether it involved digging, we assumed that the customer ends had existing duct in place. For a significant majority of Virgin Media's on-net circuits there is no information on whether they had to dig to connect the customer.

## Economies of scale and scope

- 6.56 The pattern of infrastructure presence in BT Only and BT+1 markets means that BT will have a significant cost advantage over its smaller rivals, given the existence of economies of scale and scope.
- 6.57 We consider that BT will have economies of scale as it can split its fixed costs across a larger number of CI Access users. For example:
- costs of access links: some will be shared among a larger number of customers at the same site (final lead-in duct) – though this situation is more likely to arise in HNR areas than in BT Only and BT+1 areas which may tend to be less sparsely populated – and others will be shared by many customers in the same area (distribution and spine ducts);
  - inter-exchange costs: lowest unit costs are usually achieved by purchasing the highest capacity circuit and then filling it, but only BT may have sufficient traffic to do this on some routes. The greater the number of services using an inter-exchange circuit, the lower the unit cost of that circuit; and
  - other costs: BT will purchase greater volumes of wholesale leased line equipment, hence, it may be able to negotiate lower equipment prices than providers supplying lower volumes.
- 6.58 We consider that BT will also have an advantage from economies of scope as it can recover common costs from a much larger base of business and residential customers.<sup>148</sup> This is reflected in BT's high shares of CI Access customers (shown above) and its high share of WLA customers (of around 80%).<sup>149</sup>

## Barriers to entry and expansion

- 6.59 Overall, we consider that there are high barriers to entry and expansion, which make it more difficult for rivals to BT to compete for the supply of CI Access services.

### High sunk cost is a barrier to entry

- 6.60 Entry barriers are high because a significant part of the costs of supplying wholesale leased lines are likely to be regarded as sunk costs. The costs of extending network infrastructure to connect to sites are largely sunk as the physical network built cannot be transferred to another location if it is no longer required at the original site. In our view, the asymmetry between BT as an incumbent provider which has already incurred sunk costs in creating these networks, and potential entrants which have not, gives rise to barriers to entry.

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<sup>148</sup> Common costs relating to development of physical infrastructure are particularly significant in fixed telecommunications markets as telecoms providers can use the same infrastructure to supply a range of fixed telecommunications services, including leased lines.

<sup>149</sup> Ofcom, 2018. *Wholesale Local Access Market Review: Statement* (2018 WLA Statement), paragraph 4.27. <https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review>.

## Switching costs

- 6.61 We consider that there are also some costs of switching supplier that may act as an entry barrier that will place rivals at a disadvantage to BT, which has a very high share of this market.
- 6.62 The 2016 BDRC survey suggests that switching costs may be significant for some customers. Survey respondents were read a list of potential reasons for choosing their current supplier.<sup>150</sup> While the most commonly selected reasons were price, quality and resilience, results also suggest that existing relationships with a supplier play an important role. The majority of respondents cited good contacts at the current supplier (58%) and that the supplier understands their business (52%) as important criteria when choosing their provider.
- 6.63 In addition, the survey found that around two-thirds of respondents had not switched supplier in the last five years:<sup>151</sup>
- of those that did switch suppliers almost three in five (58%) said that they found the switch to be (very or fairly) easy while 14% found it “neither easy nor difficult” and 23% found it “not very easy or not at all easy”. Just under one-third of those who had switched (31%) said that they had not incurred costs associated with switching supplier. However, among those that specified a figure, switching costs ranged from £1,000 to £25,000 – with £3,500 the average; and
  - of those who didn’t switch suppliers, 44% said that they did not switch supplier because they were happy with their current service. Respondents also mentioned some barriers to switching. 13% said that they did not switch because of the cost of breaking their existing contract, 11% said they did not switch because it would have been too difficult or “too much hassle”.

## BT’s network footprint – national coverage

- 6.64 Survey evidence suggests that the majority of large firms use a single supplier for their leased line services. For example, in the 2016 BDRC survey, 56% of respondents indicated that they use a single supplier. In an earlier survey (2015 BDRC), 66% of respondents said that they used a single supplier.
- 6.65 For multi-site contracts, suppliers may provide some circuits on-net and others off-net depending on the locations of the sites. For example, if some of the circuits are in locations where the telecoms provider does not have a nearby network (and it will be very expensive to extend the network to the customer sites) the provider may choose to supply the circuits by buying a wholesale product from another operator.
- 6.66 BT may also have an advantage in serving multi-site contracts if customers place value on knowing that a single provider supplies the physical infrastructure for the whole contract or a large part of it.

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<sup>150</sup> 2016 BDRC study, page 34.

<sup>151</sup> 2016 BDRC study, pages 52 -55.

6.67 In addition, in the absence of wholesale regulation, BT may be the only provider able to supply multi-site contracts. In such a scenario BT would have no obligation to supply wholesale access services and may refuse to offer wholesale products to its rivals, or do so only on disadvantageous terms. This would hinder rivals' ability to compete for a multi-site contract if the customer wants a single supplier.

6.68 Even if the customer is willing to deal with multiple suppliers, BT may still have an advantage. BT can leverage its market power in uncompetitive areas to competitive areas if it refuses to sell the circuits in uncompetitive areas (where the customer has no alternative supplier choice) unless the customer buys the whole contract from BT.

### Other advantages from BT's ubiquitous network

6.69 We consider that there are a number of other reasons why BT benefits from its more extensive network which makes it harder for other telecoms providers to win customers from BT:

- BT is less reliant on third-party supply: this reduces the possibility of interoperability issues occurring, contributes to a greater level of control over network equipment, can improve network security, and removes the need to negotiate wholesale supply arrangements with third party suppliers which may be complex and potentially influenced by whether the third-party supplier is also a downstream competitor; and
- route diversity: physically separate routes are required to provide a service which is resilient to faults in network infrastructure. Some users seeking high availability may value such routes. We consider BT's extensive network infrastructure may give it greater scope to connect a customer site to two separate access points. Hence, it would be easier for BT to offer and build diverse physical routes.

### Absence of potential competition

6.70 We consider that there are no prospects of potential competition that can effectively constrain BT in BT Only and BT+1 geographic markets by 2021.<sup>152</sup> This is already reflected in the limited availability of existing rival infrastructure.

6.71 We reviewed responses from telecoms providers on their future network expansion plans over the next five years. Overall, market developments are relatively limited and will not affect the level of competition in the BT Only and BT+1 markets over this review period.

6.72 The majority of responses indicated extension plans that are on a very small scale or related to core networks.<sup>153</sup> The main network expansion plans that may affect the CI Access market by 2023 are by [Redacted] and CityFibre. They are targeting residential services; however, they may still benefit business customers:

- [Redacted]; and

<sup>152</sup> As set out in paragraph 6.41, we consider that network expansion plans until 2021 are relevant to our assessment of potential competition.

<sup>153</sup> Fixed operators' future investment plans (responses to 1<sup>st</sup> s.135 notice).

- CityFibre said that its announced partnership with Vodafone drives the expansion of the network to cover approximately 1m homes with consumer FTTH and as a side effect create a dense business network as well. The plans are announced for two cities (Milton Keynes and Aberdeen) and it expects to announce a further 10-11 cities to make up the remainder of the 1m homes.

6.73 [Redacted].

6.74 In addition, we consider that any usage of a duct access remedy is unlikely to be in widespread use in the relevant geographic markets within the period of this review and therefore unlikely to lead to effective competition by 2021.

### Countervailing buyer power

6.75 We consider that there is insufficient countervailing buyer power to constrain BT's position as a supplier of CI Access services. This is because most businesses will have no or limited choice of supplier in BT Only and BT+1 geographic markets. Hence, customers cannot make a credible threat to switch volumes from BT to alternative suppliers.

### Proposed conclusion that BT has SMP in BT Only and BT+1 geographic markets

6.76 Based on evidence in the round, we are proposing to find that BT has SMP in the provision of CI Access circuits in the BT Only and BT +1 geographic markets.

6.77 This is driven by BT's very high service shares in both markets [Redacted]% (over 60%) of 2017 new customer ends, which supports an SMP finding. According to the EC SMP Guidelines, a share in excess of 50% is itself evidence of a dominant position, save in exceptional circumstances.

6.78 This finding is further supported by the very limited availability of rival infrastructure close to customer sites, high barriers to entry and expansion and the limited prospects for potential competition.

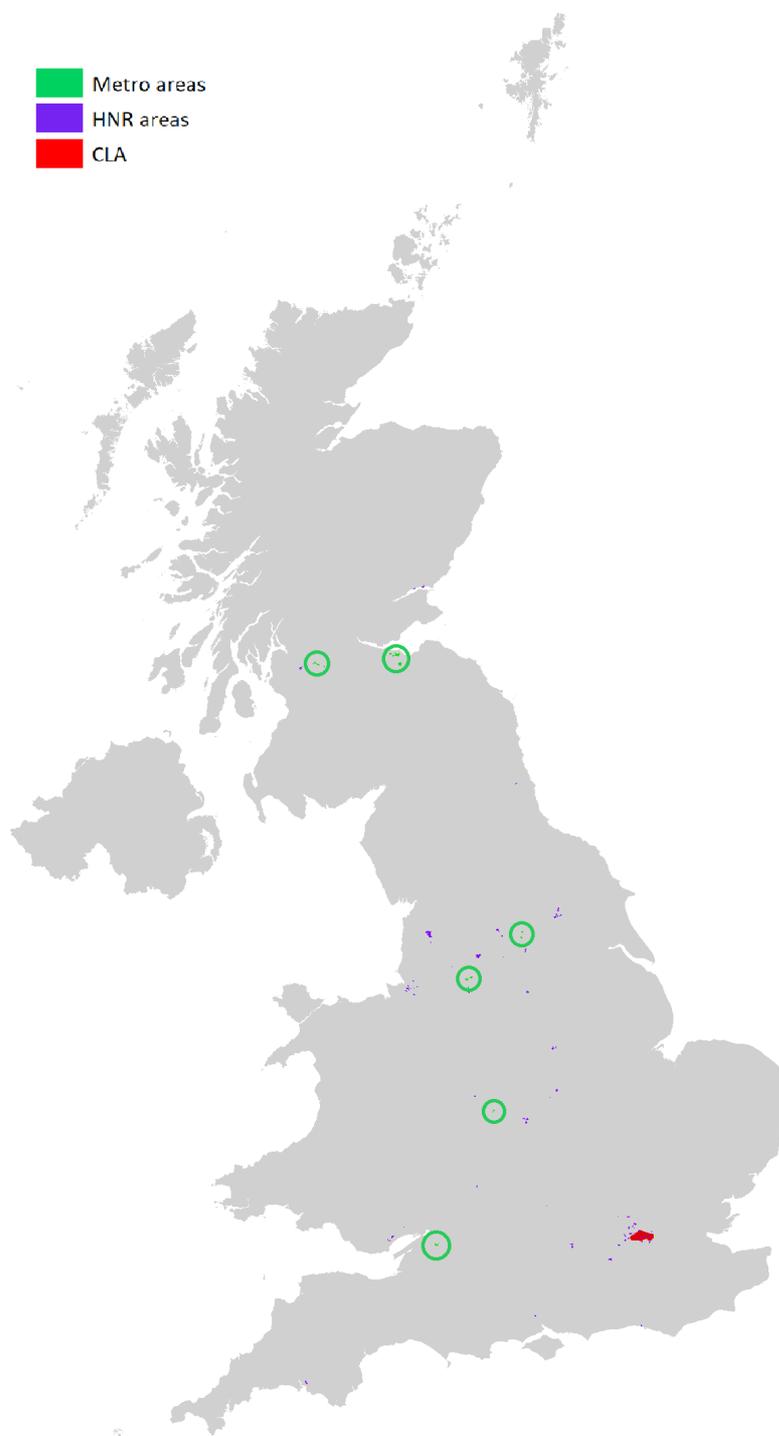
### Proposed finding that BT has SMP in each of the Metro Areas and in the HNR areas in the rest of UK

6.79 We have considered whether BT has SMP in each of the six Metro Areas that we have identified for further analysis and in the HNR areas in the rest of the UK. To avoid repetition we present our analysis for those geographic markets together. However, we show results for each market separately.

6.80 The Metro Areas are defined as HNR postcode sectors in each of Birmingham, Bristol, Edinburgh, Glasgow, Leeds and Manchester. HNR areas in the rest of UK are HNR postcode sectors outside the CLA, Metro Areas and the Hull Area.

6.81 Those geographic markets account for 3% of all postcode sectors in the UK excluding the Hull Area and account for 6% of 2017 new customer ends. Figure 6.4 shows a map of those geographic markets.

**Figure 6.4: Map of HNR areas in the UK (excluding the Hull Area)**

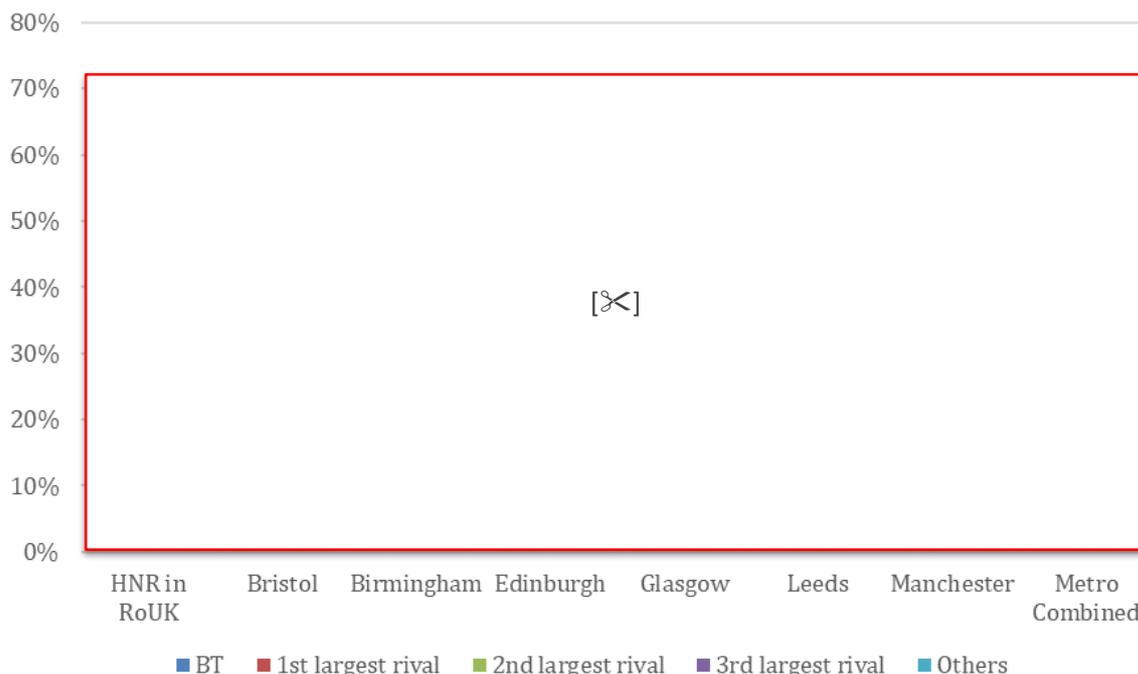


*Source: Ofcom network reach analysis. HNR areas in the Metro areas are green dots and those in the rest of the UK are purple dots. The CLA is in red dots. We added green circles around the HNR areas in the Metro areas to be able to distinguish them.*

**Very high BT market share of 2017 new connections**

6.82 Figure 6.5 shows that BT has a very high share of the 2017 new customer ends in each of the Metro Areas and the in HNR areas in the rest of the UK. BT’s share is [Redacted]% (over 50%) in each of those markets, which is above the threshold for presumed dominance (50%). The next largest rival ([Redacted]) has a significantly lower share of [Redacted]% (less than 40%) in any of the markets.

**Figure 6.5: Service shares in Metro Areas and HNR in the rest of UK**



**Source: Ofcom circuit data analysis**

6.83 This is broadly consistent with the sensitivity analysis we carried out by estimating service shares based on circuit inventories. Notwithstanding that our estimates are likely to understate BT’s service shares and overstate Virgin Media’s shares, BT still has a high share of [Redacted]% (over 50%) in each of the Metro Areas and the in HNR areas in the rest of the UK, with the exception of Edinburgh and Glasgow where BT’s service shares are [Redacted]% 41-50%. On the other hand, Virgin Media’s share is [Redacted]% (less than 40%) in each of the geographic markets defined.

**Presence of rival infrastructure**

6.84 HNR areas in the rest of the UK and the Metro Areas are made up of postcode sectors with some rival infrastructure in proximity to customer sites.<sup>154</sup> Therefore, there is likely to be some level of infrastructure-based competition in most parts of these areas. This is reflected in the network reach figure between 2.1 and 2.8 across those markets.

<sup>154</sup> These are postcode sectors where at least 65% of businesses have two or more rival networks within 50m.

Table 6.6: Infrastructure indicators in BT Metro Areas and HNR areas in rest of UK

Infrastructure Indicator		HNR in rest of UK	Metro Combined	Bristol	Birmingham	Edinburgh	Glasgow	Leeds	Manchester
Average number of rival networks within 50m		2.1	2.6	2.8	2.6	2.3	2.5	2.7	2.7
Proportion of businesses with X rival networks within 50m <sup>143</sup>	X=0	4%	3%	3%	3%	4%	2%	2%	3%
	X=1	17%	9%	7%	13%	13%	8%	6%	5%
	X=2	53%	40%	23%	32%	46%	49%	35%	44%
	X=3	20%	31%	48%	30%	29%	26%	41%	21%
	X=4	4%	12%	9%	15%	7%	10%	13%	16%
	X=5	1%	5%	8%	6%	1%	4%	3%	8%
	X=6		1%	1%			2%		2%
Average distance to the nearest three rival networks	1 <sup>st</sup>	26m	17m	17m	18m	20m	14m	18m	17m
	2 <sup>nd</sup>	52m	32m	45m	28m	39m	25m	27m	29m
	3 <sup>rd</sup>	134m	72m	65m	52m	135m	56m	42m	56m
Openreach's proportion of 2017 new customer ends already duct connected		[Redacted] 91%- 100%							
Rivals' breakdown of 2017 new customer ends <sup>144</sup>	Customer ends	[Redacted]							
	On-net duct connected	54%	58%	50%	68%	59%	58%	54%	61%
	On-net dig	7%	12%	16%	4%	17%	13%	15%	2%
	Off-net	39%	30%	34%	28%	24%	28%	31%	36%
Rivals' build vs. buy <sup>145</sup>		14%	28%	32%	13%	42%	32%	33%	5%
Median radial distance dug in 2017 (m)	Openreach	[Redacted] 0-25							
	Rivals	9	10	9	10	20	14	7	6

Source: Ofcom's network reach analysis and circuit data analysis. Annex 12 provides a more detailed description and explanation of the analysis undertaken.

- 6.85 Our analysis shows that where rival infrastructure is present, BT will be significantly closer to customer sites. This is shown by the infrastructure indicators presented in Table 6.6.
- 6.86 Evidence for HNR areas in the rest of the UK suggests that for a large proportion of users BT will be duct connected while rivals will need to extend their networks to connect the customer. This view is based on the following evidence:

- BT had duct in place when connecting over 90% of 2017 new customer ends, while rivals, on average, had duct for just over half their new connections;
- a significant minority 21% of businesses have fewer than two rivals within 50m; and
- on average, the closest rival to BT is 26m away from business sites. While it would generally be economic to dig that far, rivals may be at a significant disadvantage when competing with BT for some customers (as set out earlier). The next closest rival is just above 50m away on average.

6.87 We consider that BT's competitive advantage from being duct connected will hinder rivals' ability to compete effectively. This is reflected in how rivals chose to supply new customer ends in 2017. On average, when rivals were not connected, they chose to dig for 14% of the new connections and the median dig distance was very short (9m).

6.88 The same findings apply for each of the six Metro Areas. While the six Metro Areas do appear to be somewhat more competitive than the HNR Areas in the rest of the UK, our view is that rival networks remain at a significant disadvantage that hinders their ability to compete effectively with BT.

6.89 To illustrate this, we discuss the results for Manchester, which is the largest Metro Area and the one where rival infrastructure is closest to customer sites. Compared to other Metro Areas it has higher network reach, shorter distances to nearest rivals and a high proportion of businesses with two or more rivals within 50m.

6.90 We consider that rivals in Manchester will still be at a significant disadvantage compared to BT. BT is unlikely to face effective infrastructure-based competition for the majority of customers. This view is based on the following:

- on average, the distance to the nearest two rival networks is below 50m; however, they may not always be willing to dig to a customer site as explained earlier;
- on average, rivals connected [REDACTED] customer ends in 2017, of which 39% did not have existing duct (significantly lower than BT). This is further exacerbated by the fact that BT has a higher proportion of 2017 new customer ends. Therefore, in absolute terms, BT has significantly more customers where it has duct connections already in place;
- in choosing how to supply customer ends with no existing duct, on average, rivals provided them off-net. This reflects BT's advantage as it is cheaper to buy a wholesale product from Openreach. It may also reflect difficulties in obtaining permissions to dig as no digs occurred at all; and
- a significant minority of businesses 8% have limited access to rival infrastructure i.e. have less than two rivals within 50m.

6.91 We note that the proportion of Virgin Media's 2017 new customer ends with existing duct connections is significantly higher than the average across all rivals ([REDACTED] 71-80% and 81-90% in the HNR areas in the RoUK and in Metro Areas combined,<sup>155</sup> respectively). Even though our estimates suggest that Virgin Media's proportion of new customer ends with existing duct connections is not materially lower than BT in the Metro Areas combined, this

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<sup>155</sup> The number of customer ends is small to draw any meaningful conclusions for each Metro Area separately.

does not doesn't undermine our view that BT has a competitive advantage from being closer to customer sites and does not face effective infrastructure-based competition for the same reasons set out above for the BT+1 market.

## Economies of scale and scope

6.92 BT is the largest supplier of leased lines and is likely to have a cost advantage over its smaller rivals given the existence of economies of scale and scope. This is for the same reasons discussed in our analysis above for BT Only and BT+1 markets

## Barriers to entry and expansion

6.93 Similar to our analysis for BT Only and BT+1, we consider that there are high barriers to entry and expansion.

## Absence of potential competition

6.94 We do not consider that the network expansion plans will affect the prospects for potential competition in the Metro Areas or HNR areas in the rest of the UK.

## Countervailing buyer power

6.95 We consider that there is insufficient countervailing buyer power to constrain BT's position as a supplier of CI Access services. Even if some customers may have options to choose between alternative suppliers, the volume of their purchases will not be sufficiently material to exert effective countervailing power.

6.96 Our data shows that Openreach's largest customer is BT's downstream divisions and the ratio of internal/total sales is [REDACTED] 40-50%.<sup>156</sup>

6.97 Apart from BT's downstream retail divisions – and possibly MNOs – we do not consider there are customers whose volumes are large enough for them to exert buyer power.<sup>157</sup> Although MNOs purchase large volumes of circuits, we do not consider that they have sufficient buyer power to constrain BT. The need to provide national coverage means that many of those circuits are in areas with limited rival infrastructure such that rival suppliers face high costs in extending their network to meet the MNO's requirements. This limits the ability of the MNOs to use their large volume requirements to obtain competitive prices from BT.

6.98 BT's involvement upstream and downstream, if anything, reduces its incentives to offer (selective) discounts to competitors of its downstream divisions. Offering discounts would

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<sup>156</sup> Openreach response to the 1<sup>st</sup> s.135 notice.

<sup>157</sup> We note that even where a customer purchases significant volumes, this does not necessarily imply that this customer has material countervailing buyer power. For example, if a significant proportion of a customer's volumes can only be purchased from one supplier (as only that supplier has network in that area) this would weaken the customer's, and strengthen the supplier's, bargaining position.

only intensify downstream competition, possibly reducing margins earned and volumes sold by BT's downstream divisions.

- 6.99 Even if some purchasers were able to exercise buyer power effectively, this is unlikely to benefit customers without buyer power. Where BT is able to offer selective discounts to purchasers with buyer power, those without buyer power would not benefit, and in fact, would likely face higher prices. Where BT is not able to offer lower prices only to purchasers with (potential) buyer power, it will be less inclined to decrease prices in response to the threat of a single purchaser.

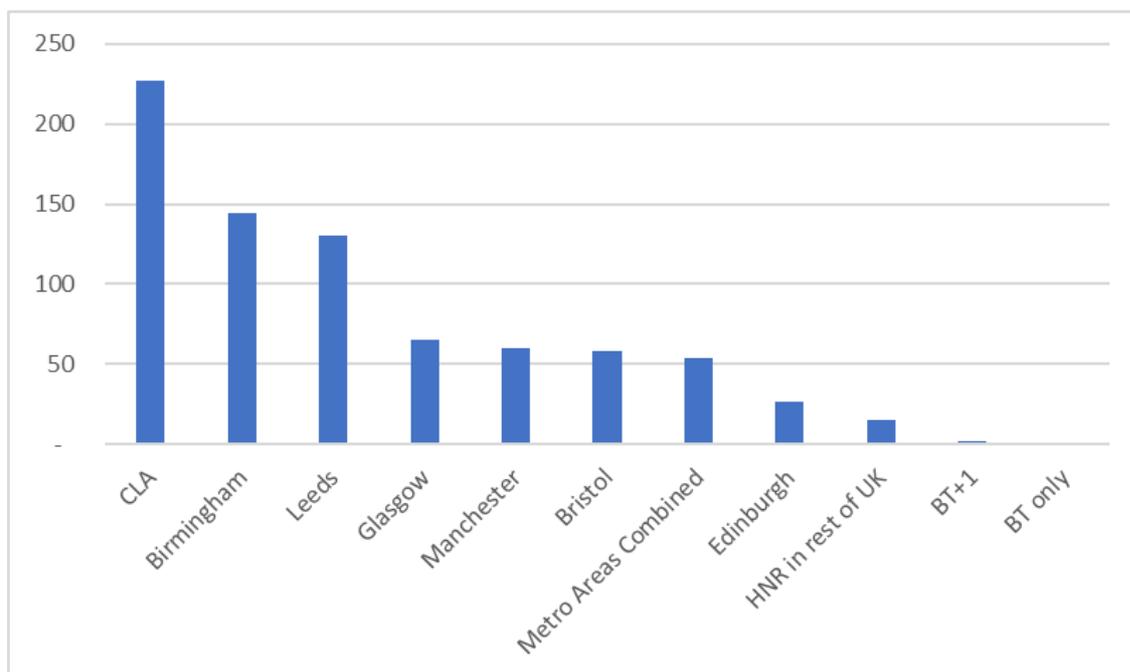
### **Proposed conclusion that BT has SMP in HNR areas in the rest of UK and each of the Metro Areas**

- 6.100 Based on evidence in the round, our proposed finding is that BT has SMP in the markets for CI Access services in HNR Areas in the rest of the UK and in each of the Metro Areas.
- 6.101 This is mainly driven by BT's high service share ([X]%, over 50% of 2017 new customer ends in each of those geographic markets), which is above the 50% threshold of presumed dominance.
- 6.102 This finding is further supported by evidence on BT's competitive advantage from being closer to a significant proportion of customer sites and BT's economies of scale and scope.
- 6.103 We do not consider that BT's position is likely to change over this market review period due to high barriers to entry and expansion and the limited prospects for potential competition.

### **Proposal to find no SMP in the CLA**

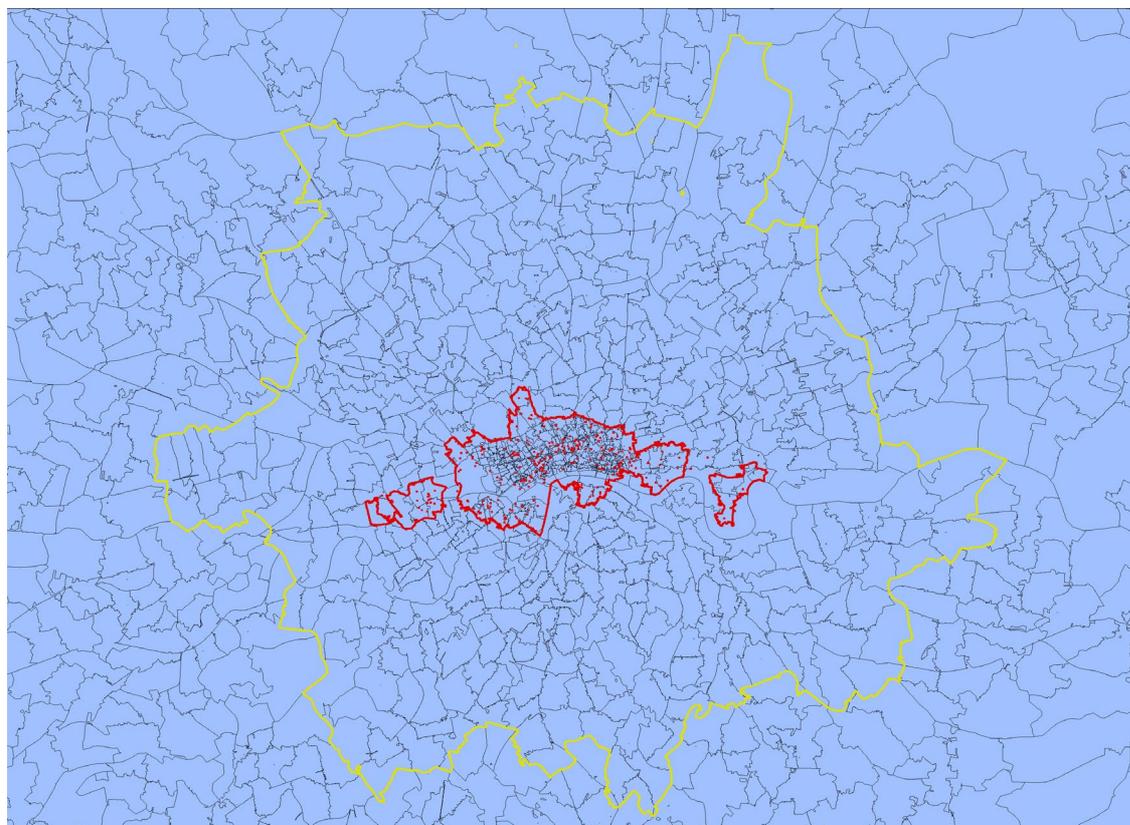
- 6.104 As shown in Section 5, postcode sectors with two or more rival networks tend to form clusters around cities and the CLA is by far the most significant cluster. The CLA on its own accounts for 45% of all HNR postcode sectors and about 65% of the 2017 new customer ends in HNR areas.
- 6.105 The CLA has a significantly higher density of CI Access customers compared to any other geographic market. This is shown in Figure 6.7, which displays the number of 2017 new customer ends per square km in each of the geographic markets.
- 6.106 Figure 6.8 shows a map of the postcode sectors in and around the CLA.

**Figure 6.7: New 2017 CI Access customer density (2017 new customer ends/km<sup>2</sup>)**



Source: Ofcom analysis.

**Figure 6.8: Map of CLA postcode sectors**



Source: Ofcom network reach analysis. Red line shows the CLA boundary and yellow line shows London Boundary.

## High BT market share of 2017 new connections.

- 6.107 BT has a high share of 2017 new customer ends in the CLA compared to its rivals. BT's share is [Redacted]% 61-70% followed by Colt with a share of [Redacted]% 21-30%. Compared to other geographic markets, BT's next largest rival managed to win a relatively higher proportion of business.
- 6.108 This is broadly consistent with the sensitivity analysis we carried out by estimating service shares based on circuit inventories. BT's share in the CLA is [Redacted]% 51-60% followed by Colt with a share of [Redacted]% 11-20%. We do not consider that our concerns regarding the reliability of circuit inventory data apply to the CLA due to the relatively limited presence of Virgin Media.

## Extensive presence of rival infrastructure

- 6.109 Unlike the rest of the UK, there is very extensive infrastructure present in a large number of postcode sectors in the CLA. This reflects the significant density of businesses with 227 new customer ends per year per square kilometre in 2017. This is compared to less than 144 in any of the other geographic markets (see Figure 6.5 above).
- 6.110 The greater density of rival infrastructure in the CLA suggests that BT is likely to be constrained by competition in the CLA, despite its high service shares. Our analysis shows far greater proximity of rival infrastructure in the CLA than in other geographic areas.
- 6.111 Table 6.9 presents results for the infrastructure indicators in the CLA. We also present the results for HNR areas in the rest of UK for ease of reference.

**Table 6.9: Infrastructure indicators for HNR areas**

Infrastructure indicator		CLA	HNR in rest UK
Average number of rival networks within 50m		4.3	2.1
Proportion of businesses with X rival networks within 50m <sup>143</sup>	X=0	3%	4%
	X=1	6%	17%
	X=2	9%	53%
	X=3	17%	20%
	X=4	17%	4%
	X=5	18%	1%
	X=6	15%	0%
	X=7	10%	
	X=8	4%	
Average distance to the nearest three rival networks	1 <sup>st</sup>	16m	26m
	2 <sup>nd</sup>	26m	52m
	3 <sup>rd</sup>	34m	134m
	4 <sup>th</sup>	47m	387m

Openreach's proportion of 2017 new customer ends already duct connected		[Redacted] 91-100%	[Redacted] 91-100%
Rivals' breakdown of 2017 new customer ends <sup>144</sup>	Customer ends	[Redacted]	[Redacted]
	On-net duct connected	76%	54%
	On-net digging	3%	7%
	Off-net	21%	39%
Rivals' build vs. buy <sup>145</sup>		11%	14%
Median radial distance dug in 2017 (m)			
	Openreach	[Redacted] 0-25	[Redacted] 0-25
	Rivals	10	9

Source: Ofcom's network reach analysis and circuit data analysis. Annex 12 provides a more detailed description and explanation of the analysis undertaken.

- 6.112 Customers in the CLA have on average 4.3 rival networks within 50m compared to 2.1 rival networks within 50m in the other HNR areas and 2.7 in Manchester (among the highest of the Metro Areas). More than 90% of customers in the CLA have at least two rivals to BT within 50m, including 65% who have four or more rivals. The proportion of customers with four or more rivals is significantly higher than any of the other HNR areas.<sup>158</sup> This shows that BT faces competition from more rivals in the CLA than in other geographic markets.
- 6.113 While BT may still have some competitive advantage over rivals where it is already duct connected, the extent is much lesser than in other parts of the UK. The average distances to the nearest four rivals range between 17m and 46m in the CLA. This compares to 26m and 388m in the other HNR areas in the rest of the UK and 17m and 92m in Manchester. Shorter dig distances combined with the higher customer density mean that on average the degree of competitive advantage is much less. In addition, where rivals are already duct connected, BT is unlikely to have a material competitive advantage. BT's rivals had duct connections already in place for 76% of CI Access customers they connected in the CLA in 2017. While this is still below BT, the difference is less marked compared to existing duct connectivity of BT's rivals in any other geographic market.
- 6.114 BT's lower competitive advantage is reflected in the lower proportion of off-net sales as a share of total rivals' sales in 2017. Rivals sold 21% of 2017 new customer ends off-net compared to 39% in HNR areas in the rest of UK and 36% in Manchester.<sup>159</sup>
- 6.115 Overall, the density of rival infrastructure implies that the vast majority of (potential) users of CI Access services are likely to have competitive alternatives available to them in the

<sup>158</sup> For example, in HNR in the rest of the UK, 79% of customers have at least two rivals to BT within 50m, of which only 5% have four or more rivals. This is compared to 92% and 26% respectively in Manchester.

<sup>159</sup> We note that where rivals did not have duct connections the proportion of 2017 new customer ends they dug to is lower in the CLA compared to the Metro Areas. This is likely to be due to the higher proportion of duct connections already in place in the CLA (i.e. the rivals have already dug to a large proportion of circuits in the past). This view is supported in the overall low share of off-net sales in the CLA.

event that BT raised its prices or otherwise offered poor terms of supply, preventing such a price increase.

## Barriers to entry and economies of scale and scope

- 6.116 We do not consider that barriers to entry and expansion, or economies of scale and scope, are likely to hinder rivals' ability to compete with BT. While entry still requires significant costs to be sunk, and economies of scale and scope in the provision of CI Access services exist as elsewhere, the number and density of businesses and users of CI Access services means these are of much reduced significance for competition in the CLA.
- 6.117 In practice, economies of scale and scope have not proven to be a barrier to entry given the extensive infrastructure present in the CLA. Accordingly, whether further entry is likely is not an important consideration for our proposal of no SMP finding. While rivals with existing infrastructure would face some costs when extending their networks to a new customer site, the close proximity of their infrastructure to many (potential) users of CI Access services (as demonstrated above) suggests that these barriers are unlikely to be high, as the distance they would need to extend their networks to is, in general, significantly lower than elsewhere in the UK.

## Prospects of potential competition

- 6.118 We also consider structural features are likely to continue to support telecoms providers' ability to compete for provision of CI Access services in the CLA. Business density is very high, suggesting the potential for telecoms providers to use the same network infrastructure to serve a greater number of customers. This suggests the size of the market is likely to remain such that it continues to sustain the presence of multiple competing operators.

## Market developments since deregulation

- 6.119 CI Access services at 1 Gbit/s and below were deregulated in the 2016 BCMR in the CLA. Deregulation included removing the obligation to supply and the wholesale charge control on those services.
- 6.120 Post deregulation, Openreach continued to supply those products. In addition, it offers price discounts on them in Flexzone areas which include the CLA (in addition to Birmingham, Glasgow and Leeds). This means that the effective price in the CLA is lower than the price in other regulated areas. We estimate that CLA prices are 8% lower for EAD 100 Mbit/s services and 10% lower for EAD 1 Gbit/s services.<sup>160</sup> This is consistent with these areas being more competitive than regulated areas, but does not necessarily show

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<sup>160</sup> This is based on an annualised three-year TCO. To derive the discount we compared the discounted TCO against the undiscounted TCO for EAD 100 Mbit/s and EAD 1 Gbit/s services. Openreach discounts can be found here: <https://www.openreach.co.uk/orgp/home/products/pricing/loadProductPrices.do?data=CHwaDmuSf84idOYbWK2Y39pyYOJW58IElJ3a1hFsXScqDWWVqEbA2PDIT5Y2OhxKv> [accessed 30 October 2018].

this as it could alternatively reflect other factors, such as lower average costs in these areas arising from higher business density. As a result, we put less weight on this evidence.

### Proposed conclusion of no SMP in the CLA

- 6.121 Based on the evidence above, we propose that BT does not have SMP in the provision of CI Access circuits in the CLA. The key distinguishing feature of the CLA is the fact that sufficient infrastructure has been deployed so as to exert strong competitive constraints on BT.
- 6.122 BT has service shares of [X]% 61-70% of 2017 new customer ends in the CLA. While this is above the 50% level at which dominance can be presumed (subject to other factors), this is somewhat lower than the service shares in other geographic markets, including the other HNR areas outside the CLA. In terms of services shares based on circuit inventory, BT's share is also above 50%.<sup>161</sup>
- 6.123 However, the density of rival infrastructure in the CLA is an order of magnitude greater than all other areas, reflecting a long history of competitors building leased line networks to serve the financial sector and other businesses with high leased line demand in the CLA. While BT continues to account for a high share of leased line sales in the CLA – as in 2016 – we consider that this dense network of rival infrastructure is likely to be sufficient to act as an effective competitive constraint on BT.

### Provisional conclusions

- 6.124 We provisionally conclude that, for the period of this review, BT has SMP in the supply of CI Access services in the UK, excluding the CLA and the Hull Area.<sup>162</sup>

### Consultation questions

Question 6.1: Do you agree with our proposed approach to SMP assessment for CI Access in the UK excluding the Hull Area? Please provide evidence to support your views.

Question 6.2: Do you agree with our proposed SMP findings for CI Access in each of the geographic markets defined? Please provide evidence to support your views.

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<sup>161</sup> Unlike the other geographic markets, we do not have major concerns around the reliability of BT's inventory service shares in the CLA due to the more limited presence of Virgin Media.

<sup>162</sup> The SMP assessment for CI Access services in the Hull Area is set out separately in Section 9.

## 7. CI Inter-exchange connectivity

- 7.1 In Section 3, we explained the distinction between access and inter-exchange services. This section sets out our market assessment for CI Inter-exchange connectivity, including analysis of market definition and our proposed findings in relation to market power.
- 7.2 In summary, we are proposing that there is a single product market for CI Inter-exchange services for all bandwidths and each BT exchange is its own geographic market. We propose, on the basis of the three-criteria test, that some of these BT exchanges are susceptible to *ex ante* regulation. We propose that BT has SMP in BT exchanges where only BT, or BT plus one Principal Core Operator (PCO),<sup>163</sup> are present. We propose that BT does not have SMP where there are two or more PCOs present, i.e. that those BT exchanges are effectively competitive.
- 7.3 There are currently 5,573 BT exchanges, of which the vast majority are not competitive. For simplicity, our proposed regulation<sup>164</sup> lists the BT exchanges where we do *not* consider BT has SMP (those where there are two or more PCOs), and therefore do not propose to regulate.<sup>165</sup> Our provisional conclusions are as follows:

**Table 7.1 Number of BT exchanges by PCO presence**

	BT Only	BT + 1	BT + 2 or more	Total
<b>BT exchanges</b>	4,327	701	545	5,573

- 7.4 As noted in Table 7.1 above, we propose that routes between the 545 BT exchanges where there are two or more PCOs present will not be regulated. All other routes between BT exchanges will be regulated.
- 7.5 In this section we:
- explain what inter-exchange connectivity is, explain why we examine the competitiveness of BT exchanges, and set out the regulatory context;
  - outline the existing regulation;
  - explain why we consider carrier neutral data centres (DCs) are competitive;
  - define the relevant product and geographic market for CI inter-exchange connectivity;
  - undertake a market power assessment to establish in which BT exchanges BT has SMP, and in which it does not;
  - propose to apply regulation to non-competitive CI inter-exchange connectivity on the basis of the three-criteria test; and
  - set out our provisional conclusions.

<sup>163</sup> As explained below, to be classified a PCO, a telecoms provider needs to own its own fibre network, have a substantial footprint, and have capacity to offer wholesale inter-exchange connectivity.

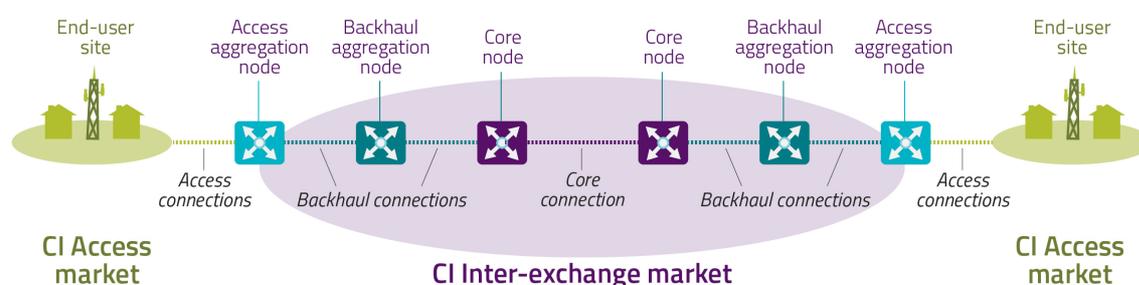
<sup>164</sup> Schedule 6 of our draft legal instrument.

<sup>165</sup> This approach is consistent with how we have presented results in the 2016 BCMR and Temporary Conditions and makes it easier for stakeholders to identify the BT exchanges for which regulation will not apply.

## Background

### Market context

Figure 7.2: Access and Inter-exchange connectivity



- 7.6 Figure 7.3 above sets out the connections that we consider are part of the CI Inter-exchange connectivity market. It comprises of backhaul and core connections. We explained in Section 3 that as a result of data aggregation, backhaul circuits transport more communications services and have greater capacity, i.e. higher bandwidth, than access circuits. Core circuits may transport even more communications services and often have greater capacity than backhaul circuits.
- 7.7 BT exchanges act as network nodes, which are used to aggregate traffic and can act as interconnection points between networks. Operators need access to BT exchanges to be able to use some of BT’s wholesale access services. Fixed broadband operators are particularly reliant on BT’s exchange infrastructure. They offer access services based on LLU and VULA, served from BT exchanges, where they have equipment co-located to aggregate broadband traffic. They rely on leased lines to backhaul this aggregated broadband traffic to their core network from BT’s exchanges. Sky and TalkTalk are the largest broadband operators using LLU and VULA products with presence at [Redacted] exchanges, respectively.<sup>166</sup> A large number of BT’s exchanges are located in areas where few or no other telecoms providers have network. A significant proportion of Sky’s [Redacted]%, and TalkTalk’s [Redacted]% backhaul circuits connect directly from one BT exchange to another.<sup>167</sup>
- 7.8 Because of the importance of these BT exchanges to the business connectivity market for connecting between access networks, we examine whether BT has market power at each exchange.

<sup>166</sup> Responses to part B of the 5<sup>th</sup> BCMR s.135 notice dated 14 February 2018.

<sup>167</sup> Ofcom analysis, based on response to part A of the 5<sup>th</sup> BCMR s.135 notice dated 14 February 2018.

## Regulatory context

- 7.9 In 2007, the European Commission removed the market for wholesale trunk segments of leased lines from the list of recommended markets.<sup>168</sup> Therefore, at the European level it is presumed that this market is not amendable to the imposition of *ex ante* regulation. The market for wholesale high-quality access provided at a fixed location remains a recommended market.
- 7.10 The Explanatory Note to the 2014 EC Recommendation provides the following commentary, with emphasis added:
- “What constitutes precisely a terminating segment of a leased line will depend on the network topology specific to a particular Member State. **Most Member States have defined terminating segments of leased lines as the part between end-users’ premises and the closest exchange of a service provider. However, a clear distinction between the terminating and trunk segment is important as the market for wholesale trunk segments of leased lines has been removed from the list of markets susceptible to ex ante regulation in the 2007 Recommendation.** Nowadays, almost all Member States have deregulated this wholesale market for trunk segments. Therefore the presumption that trunk segments are replicable on a national scale remains valid. Consequently, NRAs should not revisit their analysis of trunk segments of leased lines where these have been previously found to be effectively competitive. This assumption does not exclude, however, **that individual NRAs might find that certain trunk routes fulfil the three criteria and thus warrant ex ante regulation.**”<sup>169</sup>
- 7.11 Terminating segments are considered in our assessment of CI access services. We consider inter-exchange connectivity services to be trunk segments. The purpose of this section is to examine which routes in inter-exchange connectivity may exhibit SMP and therefore warrant *ex ante* regulation (in that they fulfil the three criteria).
- 7.12 Connections between BT exchanges are part of a wider set of trunk connections. This wider set includes trunk connections to and from the network nodes of other telecoms providers (which are presumed competitive because they are part of the telecoms provider’s core network, a network that can rival BT’s), and carrier owned data centres. We also consider carrier neutral DCs to be presumed competitive, for reasons explained below.
- 7.13 Our proposal to define only CI access services as terminating segments is a change from the approach taken in the 2016 BCMR. In the 2016 BCMR, we treated all circuits that were not identified as competitive in our CI core assessment as terminating segments.<sup>170</sup> In this consultation, we treat these connections as part of inter-exchange connectivity.

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<sup>168</sup> EC, 2014. Explanatory note to the 2014 EC Recommendation (SWD(2014) 298), page 49.

[http://ec.europa.eu/newsroom/dae/document.cfm?action=display&doc\\_id=7056](http://ec.europa.eu/newsroom/dae/document.cfm?action=display&doc_id=7056) [accessed 30 October 2018].

<sup>169</sup> Explanatory Note to the 2014 EC Recommendation, pages 49-50.

<sup>170</sup> This included links between exchanges and carrier neutral data centres where one end of the link was deemed uncompetitive.

## Existing regulation

- 7.14 As noted in Section 2, the regulation applicable to the links we are considering here is laid out in the 2017 Temporary Conditions. In those documents, we referred to the competitive links between BT exchanges and carrier neutral DCs as CI core.
- 7.15 Currently there are 191 BT exchanges that are not regulated.<sup>171</sup> There are also 64 carrier neutral DCs that are not regulated.

## Existing Core

- 7.16 In the 2009 and 2013 BCMR, we identified 56 Trunk Aggregation Nodes (TANs) that marked the boundary between the competitive core and terminating segments. To define the TANs, we identified 84 appropriate Openreach Handover Points (OHPs) and then grouped them into multi-exchange TANs and single BT exchanges.
- 7.17 Our reason for grouping certain exchanges into TANs was that we considered telecoms providers would be unlikely to aggregate their traffic back to points of interconnect at all of BT's OHPs (in particular, those that were geographically close to each other).
- 7.18 BT is not required to provide regulated circuits between TANs. However, the intra-TAN circuits (the circuits between BT exchanges within a multi-exchange TAN) were and remain regulated.

## Temporary Conditions

- 7.19 In the Temporary Conditions, we identified an additional 107 BT exchanges as well as the 64 carrier neutral DCs<sup>172</sup> that met our competitive threshold and were therefore considered competitive.<sup>173</sup>

## Carrier neutral data centres

- 7.20 As explained in Section 3, data centres can act as network nodes. Backhaul connections between data centres, telecoms providers' network nodes and BT exchanges are part of the wider set of trunk connections.
- 7.21 In the 2016 BCMR we examined each carrier neutral DC to establish those at which rival operators were present and therefore could be considered competitive.
- 7.22 This assessment was important in the 2016 BCMR, where we treated all circuits that were not identified as part of the competitive core as terminating segments. In this review we

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<sup>171</sup> These consist of 56 TANs (comprised of 84 BT exchanges) and 107 other BT exchanges as identified in the Temporary Conditions.

<sup>172</sup> These were the same carrier neutral DCs that we found competitive in the 2016 BCMR.

<sup>173</sup> BT exchanges and carrier neutral DCs at which there were three or more PCOs (directly or indirectly connected) present and/or BT plus two directly connected PCOs present were identified as competitive. See the section below on other factors that affect competitive constraints for an explanation of direct vs. indirect.

consider that backhaul connections between carrier neutral DCs are part of the trunk segment and are therefore presumed competitive.

7.23 In our view carrier neutral DCs tend towards effective competition, i.e. BT does not have SMP in the provision of backhaul connections to and from carrier neutral DCs, for several reasons:

- carrier neutral DCs can act as points of interconnection between telecoms providers. As connectivity is an important part of their function most tend to have multiple telecoms providers present;
- similarly, the need for connectivity from multiple providers influences a carrier neutral DC's commercial decision in choosing location. They are likely to locate close to where more than one telecoms provider's network is present;
- customers tend to have choice as to which data centres to connect to, which we consider imposes an indirect constraint on BT. If the price of backhaul connectivity to the data centre was to increase and was passed on to the customers of the carrier neutral DC, customers might choose to switch and use an alternative carrier neutral DC. Alternatively, given these data centres tend to be located in areas where rivals are present, the data centre might seek additional telecoms providers to connect in; and
- our analysis shows that BT has a share of supply of circuits to all data centres and carrier neutral DCs of only [X]%.<sup>174</sup>

## Market definition

### Product market definition

7.24 The main purpose of the product market definition is to identify the competitive constraints on each of the CI inter-exchange services provided by BT over the Openreach network. To define the product market for CI inter-exchange connectivity, like our product market definition assessment for CI access services, we have followed the SSNIP test as our conceptual approach (see Section 4 for an explanation of the SSNIP test).

7.25 Our focus is on whether the supply of a circuit at one bandwidth is a competitive constraint on the supply of another circuit at a different bandwidth, such that they should be considered part of the same relevant market when assessing whether BT has SMP. We consider supply-side substitution is the primary source of competitive constraint, for the reasons explained below.

7.26 BT uses EAD and EBD products of various bandwidths, as well as OSA products, to provide links between BT exchanges.<sup>175</sup> These various bandwidth products are the focal products for CI inter-exchange connectivity.

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<sup>174</sup> These calculations are based on our 2017 connections data.

<sup>175</sup> EAD, EBD and OSA products are discussed in Section 3.

### Demand-side substitution

- 7.27 Demand-side substitution arises when customers switch to alternative products in response to changes in their relative prices. The key question is whether the number of customers switching to an alternative product would be enough to render the SSNIP unprofitable, in which case the relevant market should be expanded to include the candidate substitute.
- 7.28 As backhaul and core connections typically require higher bandwidth than access connections we primarily consider whether circuits at bandwidths less than or equal to 1 Gbit/s are a substitute for higher bandwidth circuits. A SSNIP on 1 Gbit/s reduces the price differential with 10 Gbit/s and may induce some degree of switching. For example, a telecoms provider noted that it would be willing to move from 1G to 10G, but only where this allows it to minimise costs to meet bandwidth requirements.<sup>176</sup> This indicates that telecoms providers are willing to upgrade where it is cost efficient to do so.
- 7.29 From a demand-side perspective it is ambiguous whether a SSNIP on 1 Gbit/s would result in a sufficient number of customers switching to 10 Gbit/s to render a SSNIP unprofitable. Analysis of the pricing comparisons between 1 Gbit/s after a SSNIP and 10 Gbit/s suggests that customers would find it cheaper to purchase or continue using a 1 Gbit/s circuit than upgrade to 10 Gbit/s. We consider that the price differentials are such that it is unlikely a significant number of 1 Gbit/s customers would switch to 10 Gbit/s in response to a SSNIP. However, these price differentials may be distorted by BT's high prices for 10 Gbit/s circuits.
- 7.30 We consider that a 10 Gbit/s customer has purchased that circuit because they need or expect to need that bandwidth, so would be unlikely to downgrade to a 1 Gbit/s circuit in response to a SSNIP. Hence, a SSNIP on 10 Gbit/s is unlikely to result in a sufficient number of customers switching to a lower bandwidth to render a SSNIP on 10 Gbit/s unprofitable.<sup>177</sup>
- 7.31 Therefore, our analysis suggests that demand-side substitution between 1 Gbit/s and 10 Gbit/s is likely to be weak and asymmetric at a minimum.

### Supply-side substitution

- 7.32 Supply-side substitution considers whether suppliers of a service can switch production to another service in the short term and without incurring significant additional costs to render a SSNIP unprofitable.
- 7.33 As set out in Section 3, different types of CI leased lines are delivered over the same physical network infrastructure. Where a telecoms provider is already connected to the BT

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<sup>176</sup> [Redacted].

<sup>177</sup> Annex 8 contains our analysis of critical loss in the context of CI Access. This analysis is analogous to the demand-side analysis described in this section.

exchange or a data centre, it can offer a full suite of bandwidths relatively quickly and at little incremental cost, constraining BT from the supply side. For some circuits the difference between different bandwidth leased line services are the electronics installed at the circuit ends (e.g. 1 Gbit/s compared to 10 Gbit/s EAD circuits). In some cases (e.g. EBD), the same equipment is generally used to supply 1 Gbit/s and 10 Gbit/s.<sup>178</sup> In the event of a SSNIP on 1 Gbit/s, a supplier of 10 Gbit/s could offer 1 Gbit/s quickly and with minimal cost and vice versa. A similar conclusion can be reached between Ethernet services at 10 Gbit/s and WDM (i.e. OSA) services, as well as across WDM services of different bandwidths.

- 7.34 Therefore, we consider different bandwidths to be supply-side substitutes where a telecoms provider has an existing connection to the BT exchange such that a hypothetical monopolist of a given bandwidth would not be able to profitably impose a SSNIP.

### Geographic market definition

- 7.35 The conditions of competition can vary at each BT exchange. We assess competition at each BT exchange on a site-by-site basis. Therefore, we define each BT exchange as a distinct geographic market. This contrasts to our approach to geographic market definition in CI access, where due to the very large number of customer locations, we aggregate customer locations into broader candidate geographic markets with similar competitive conditions to undertake our assessment.
- 7.36 We do not consider that connections to one exchange are a substitute for connections to another exchange. For example, fixed broadband operators must be present at a specific exchange to serve broadband customers in the corresponding access area.

### Provisional conclusion on market definition

- 7.37 We propose to define a separate product market for CI inter-exchange connectivity consisting of all CI Inter-exchange services at all bandwidths on the basis of supply-side substitution; and each individual BT exchange as a distinct geographic market.

## SMP assessment

### Proposed approach to assessment of SMP

- 7.38 We apply two tests to determine whether it is appropriate to consider regulation of CI inter-exchange connectivity at BT exchanges. First, we must assess which BT exchanges are susceptible to *ex ante* regulation. We do this by applying the three-criteria test, set out in

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<sup>178</sup> Some network equipment simply requires a change in the laser module to change line speed, and the number of circuits supported can be increased using pluggable equipment modules.

the 2014 EC Recommendation.<sup>179</sup> Second, we must assess in which BT exchanges there is a provider with SMP.

7.39 The 2014 EC Recommendation notes that the three-criteria test and the SMP assessment “may make use of similar indicators”. We consider it convenient to present the SMP assessment first, before turning to the three-criteria test, noting that both tests need to be satisfied to impose regulation.

7.40 To assess SMP, we take the following steps:

- consider possible indicators for SMP;
- provisionally conclude that presence of alternative infrastructure providers at a BT exchange is the preferred main approach and explain our reasoning for this position;
- provisionally define a list of infrastructure providers that we consider provide a competitive constraint on BT;
- consider whether there are any factors that might affect the strength of the constraint;
- conduct an SMP assessment at all BT exchanges; and
- summarise our provisional conclusion on the BT exchanges at which we consider BT has SMP.

## Indicators of SMP

7.41 The objective of our assessment is to identify which connections between BT exchanges are not competitive. To meet this objective, we have considered different possible indicators of SMP.

7.42 Typically, we consider market shares as a possible indicator of SMP, and one approach that we have considered is to calculate estimates of BT’s share of inter-exchange connectivity. We have identified three issues which make inter-exchange connectivity market shares a less valuable indicator:

- first, there are limitations to telecoms providers’ circuit data. Their core and backhaul circuit data is often far from complete, because telecoms providers do not routinely collect the necessary data.<sup>180</sup> This means that any calculation of service shares would be likely to be inaccurate;
- second, terms such as access, backhaul, core and inter-exchange connectivity are regulatory constructs; they do not correspond to the underlying technology or reflect agreed industry standards. Operators build their networks differently and some do not

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<sup>179</sup> EC, 2014. *Recommendation 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). <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32014H0710> [accessed 30 October 2018].

<sup>180</sup> See 2015 BCMR Consultation, paragraph 4.197; 2016 BCMR, Annex 15, paragraphs 15.30 and 15.125. Both at: <https://www.ofcom.org.uk/consultations-and-statements/category-1/business-connectivity-market-review-2016>.

clearly distinguish between these terms.<sup>181</sup> Hence, it would be difficult to ensure that we treated each operator’s network on a like-for-like basis;<sup>182</sup> and

- third, with approximately 5,600 BT exchanges, of which roughly 1,250 have at least one PCO present, trying to calculate service shares on a route-by-route basis would be a substantial and disproportionately onerous task given the availability of an alternative method.

7.43 These problems suggest that an alternative approach would be preferable. In the 2016 BCMR, we used presence of PCOs at a site as a proxy for competitive conditions between BT exchanges. We continue to consider presence of PCOs<sup>183</sup> to be a good proxy for the amount of competition and therefore the choice available to telecoms providers at BT exchanges for an inter-exchange connectivity service.

7.44 While our primary focus is on presence of PCOs, we have also considered whether there is a potential competitive constraint from providers that are not currently connected to BT exchanges. We have looked at this below in our detailed SMP assessment.

### Establishing Principal Core Operators (PCOs)

7.45 To identify the BT exchanges at which BT has SMP, we need to identify those telecoms providers that may present a competitive constraint on BT in the CI Inter-exchange connectivity market.

7.46 In the 2016 BCMR, we defined PCOs as “a subset of telecoms providers that have substantial core infrastructure and the capacity to provide wholesale leased lines to other telecoms providers”.<sup>184</sup> At the time, we considered the following telecoms providers to be PCOs: Colt, Interoute, KCOM, Level3, Neos, Verizon, Virgin Media, Vodafone.

7.47 We consider that the definition of PCOs remains broadly appropriate. In short, we are looking for telecoms providers that: own their own network infrastructure, have a substantial footprint, and have the capacity to offer a wholesale inter-exchange connectivity service to other telecoms providers.<sup>185</sup> For example, if an infrastructure

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<sup>181</sup> 2015 BCMR Consultation – Annexes, page 288.

<sup>182</sup> 2015 BCMR Consultation – Annexes, page 278.

<sup>183</sup> We continue to consider the number of resellers (these are telecoms providers that do not own fibre but use another infrastructure provider’s fibre to sell services to other telecoms providers) present at a BT exchange a poor proxy for competition, as the constraint is much weaker and ultimately dependent on the number of PCOs present.

<sup>184</sup> Ofcom, 2016 BCMR – Annexes 14 to 25, page 36.

<sup>185</sup> For our definition of PCOs to be appropriate, it is important to include the requirement that their footprint be substantial at BT exchanges. This is because evidence from telecoms providers suggests that BT has inherent advantages in exchanges, in particular the scope of its network and diversity. PCOs, as we have defined them, should provide an effective constraint on BT when they are present. We note for example that [Redacted] but does not consider its presence sufficient to allow it to provide a competitive IEC offer from BT exchanges.

provider has some presence, but does not have the capacity to offer a wholesale service because it has insufficient penetration, it should be excluded from the list of PCOs.<sup>186</sup>

7.48 There have been developments in the market, which have led us to consider amending the list of PCOs.<sup>187</sup> To enable us to compile an accurate list of PCOs, which both captures the characteristics noted above and reflects developments in the market, we sent a statutory information request to relevant telecoms providers.<sup>188</sup>

7.49 On the basis of the responses we received, we propose the following telecoms providers are PCOs: CenturyLink (previously Level3<sup>189</sup>), CityFibre<sup>190</sup>, Colt, Eircom, SSE (previously referred to as Neos<sup>191</sup>), Virgin Media, Vodafone, and Zayo.<sup>192</sup>

## Direct and indirect connections into BT exchanges

7.50 A direct connection is where a PCO is present with network equipment at a BT exchange and is purchasing an External Cablelink<sup>193</sup> variant to connect into its own network. An indirect connection is where a customer (not necessarily a PCO, e.g. TalkTalk) is present at an exchange and purchasing an External Cablelink variant to connect into a PCO's network. In this case, the PCO, who is selling a service to the customer (e.g. TalkTalk) will often not have network equipment at the BT exchange.

7.51 Our intention is to establish whether there is any reason to treat PCOs that provide a direct connection from BT exchanges differently to those that connect indirectly. We have looked at whether an indirect connection provides a sufficient competitive constraint on BT's supply of wholesale of CI inter-exchange connectivity services.<sup>194</sup>

7.52 To help establish whether an indirect connection provides a sufficient constraint on BT, we used our statutory information gathering powers<sup>195</sup> to ask buyers of wholesale leased line services whether they use indirect connections to receive wholesale leased line inter-

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<sup>186</sup> For the avoidance of doubt, if the infrastructure provider does not wholesale from BT exchanges, then it would be excluded from the analysis.

<sup>187</sup> CityFibre acquired KCOM's assets, and we are aware of other developments, such as Zayo's purchase of Geo in July 2014 and CityFibre's acquisition of Entanet in July 2017.

<sup>188</sup> 3<sup>rd</sup> BCMR s.135 notice dated 13 April 2018.

<sup>189</sup> In November 2017, CenturyLink completed its acquisition of Level3.

<sup>190</sup> In December 2015, CityFibre acquired much of KCOM's national communications infrastructure (excluding Hull and East Yorkshire).

<sup>191</sup> SSE bought Neos in 2003. In previous market reviews, we have referred to it as Neos. In this market review, we have referred to it as SSE.

<sup>192</sup> We note that [Redacted].

<sup>193</sup> An External Cablelink variant is a fibre cable connection which can be used to link other telecoms providers' equipment at a location within a BT exchange to an external Openreach footway box close to but just outside the BT exchange.

<sup>194</sup> In the 2016 BCMR, we considered that an indirect connection might provide a weaker competitive constraint on BT, because although the PCO outside the BT exchange may have been able to offer a rival backhaul service in some instances, we were concerned that it might provide less of a constraint than an operator directly purchasing interconnect services at an exchange. We were particularly concerned that indirectly connected PCOs might lack the network and/or capacity to provide wholesale interexchange connectivity services at these locations (2016 BCMR – Annexes 14 to 25, paragraphs 15.71-77).

<sup>195</sup> 3<sup>rd</sup> BCMR s.135 notice dated 13 April 2018.

- exchange connectivity services, or to receive a single circuit or other non-inter-exchange connectivity service.<sup>196</sup>
- 7.53 We found that telecoms providers purchasing External Cablelink variants are doing so to connect to a PCO's network to receive an inter-exchange connectivity service. Specifically, we found that 99% of purchases were for an inter-exchange connectivity service. This is consistent with our findings from the largest purchasers of wholesale leased line services through indirect means, i.e. Sky [REDACTED]%, TalkTalk [REDACTED]% and Vodafone [REDACTED]%.<sup>197</sup> This indicates that where a telecoms provider connects into a PCO's network indirectly, the PCO's core network should pass outside the BT exchange.
- 7.54 We also analysed the wholesaling activities of Virgin Media, the largest provider of indirect inter-exchange connectivity services, to find out how many telecoms providers it was wholesaling to on an exchange-by-exchange basis. We found that it was not uncommon for it to provide inter-exchange connectivity services to two or more telecoms providers from outside BT exchanges at 47% of BT exchanges where Virgin Media was indirectly present it served at least two telecoms providers with wholesale inter-exchange connectivity. This suggests that the network available outside a BT exchange, when a PCO is providing an inter-exchange connectivity service indirectly, is capable of supporting multiple wholesale customers.
- 7.55 Moreover, evidence from Virgin Media suggests that the instances where indirect connections go straight into another telecoms provider's core nodes, instead of through its own core network, are rare. It said that in the vast majority of instances traffic will go from outside a BT exchange directly into its core network. Virgin Media further explained that given the cost of digging, this was a rational decision from an economic and commercial perspective.<sup>198</sup>
- 7.56 In cases where a PCO has provided dark fibre for another telecoms provider from outside a BT exchange, given the high costs of installation, PCOs will typically provide enough fibre for the anticipated level of demand over the life of the infrastructure. We therefore expect additional fibre capacity to be available to wholesale to other telecoms providers [REDACTED].<sup>199</sup>
- 7.57 We consider that indirect connections provide a sufficient constraint on BT, so we propose to treat them in the same manner as direct connections.

## BT exchanges in which BT has SMP

- 7.58 Having defined a list of potential competitors and considered whether other factors may affect how we treat the list, we now move on to consider the threshold under which BT would have SMP at BT exchanges.

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<sup>196</sup> There may be cases where a telecoms provider receives a single circuit or other non inter-exchange connectivity service from a PCO outside a BT exchange, but the PCO in question is still able to provide an inter-exchange connectivity service outside that exchange. Therefore, our results are likely to underestimate the percentage of exchanges where an interexchange connectivity service could be provided.

<sup>197</sup> 3<sup>rd</sup> BCMR s.135 notice dated 13 April 2018.

<sup>198</sup> Meeting with Virgin Media on 25 May 2018.

<sup>199</sup> Meeting with [REDACTED].

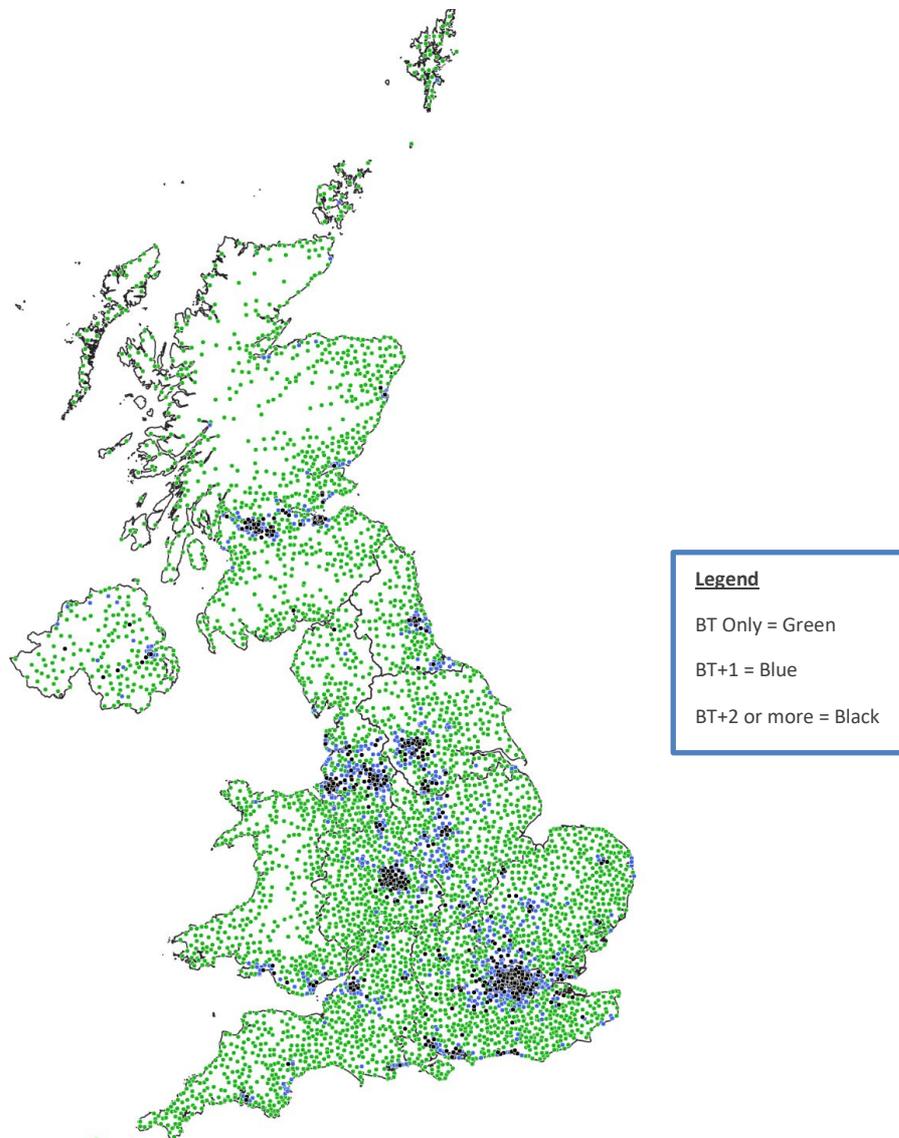
7.59 We assess the level of presence at each BT exchange and for the purpose of our SMP assessment below we aggregate these into:

- BT Only exchanges;
- BT+1 exchanges; and
- BT+2 or more exchanges.

7.60 We have also considered, through network reach analysis, the possibility of networks that are not currently connected to BT exchanges, but may decide to connect because they are sufficiently proximate to a BT exchange, may affect our SMP assessment.

7.61 Figure 7.4 illustrates where each of these exchanges are located.

**Figure 7.4 Map of BT Only, BT+1 and BT+2 or more exchanges**



Source: Ofcom analysis.

**Proposed finding that BT has SMP in ‘BT Only’ exchanges**

- 7.62 Potential customers should be able to seek competitive bids for inter-exchange connectivity from PCOs that are present at BT exchanges. However, with only one provider present (i.e. BT), there is a de facto monopoly at the BT exchange.<sup>200</sup> We therefore provisionally conclude that BT Only exchanges are not competitive.
- 7.63 Infrastructure owning telecoms providers who are not already present at the relevant BT exchange are unlikely to be able to provide a constraint on BT’s market power. This is because for them to provide a constraint, they would need to extend their network to the relevant site.
- 7.64 We consider it highly unlikely that PCOs would extend their networks to the vast majority of BT Only exchanges, given the substantial distance between these exchanges and other networks. The nearest PCO network is on average 6.2km away, with a median distance of 2.7km. The second nearest PCO network is on average 13.0km away, with a median distance of 6.0km. In addition, even if one PCO was to dig to the exchange, it might still not be sufficiently competitive, as discussed in the following sub-section. Moreover, as illustrated by Figure 7.5, most BT Only exchanges are typically found in more remote or rural areas and therefore have lower demand for backhaul. As a result, there are likely to be limited incentives for PCOs to extend their networks to connect to these exchanges and such suppliers would be at a significant cost and time disadvantage to BT which is already at the exchange. Finally, in the absence of any concrete plans, in our view it is highly uncertain that PCOs would connect to any specific exchange during the course of this review period.
- 7.65 These reasons lead us to provisionally conclude that BT has SMP in BT Only exchanges.

**Proposed finding that BT has SMP in ‘BT + 1’ exchanges**

- 7.66 Where there are two operators competing for customers in BT+1 exchanges, choice of supplier is still very limited. In a bidding market for a homogeneous service it does not take many suppliers for the benefits of competition to be realised. If two rival providers are present, in some instances this might be sufficient. However, economic theory suggests that markets with two competitors are highly amenable to collusion. This is particularly the case where suppliers compete frequently against each other.
- 7.67 Suppliers of wholesale services at BT exchanges are also the major competitors of many of the main purchasers in the retail market (for example Virgin Media is the non-BT PCO with most presence at exchanges, and also a competitor with Sky and TalkTalk in the retail broadband market downstream). Higher backhaul costs for competitors could translate into a competitive advantage for the suppliers at the retail level. Therefore, where there is

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<sup>200</sup> We have based our classification primarily on data from suppliers. There are some discrepancies between the data from suppliers of inter-exchange connectivity and data from purchasers, which we will investigate further during the consultation period.

insufficient competition, suppliers of inter-exchange connectivity may not have the right incentives to sell at a competitive price.

- 7.68 Evidence supplied by Sky indicates that it purchases [REDACTED] to connect to and from BT+1 exchanges<sup>201</sup> [REDACTED], indicating less reliance on circuits between BT exchanges compared to exchanges where only BT is present. In contrast, [REDACTED].
- 7.69 We consider it unlikely that PCOs would extend their networks to the vast majority of BT+1 exchanges. The distance to the nearest second network is 1.53km on average, with a median distance of 319m. Although these distances are shorter than at BT Only exchanges, they are still likely to mean that digging is uneconomic for the vast majority of cases and would place the supplier at a significant time and cost disadvantage to BT. In addition, there is little certainty that networks would dig to any given BT+1 exchange over the course of this two-year review.
- 7.70 These reasons lead us to provisionally conclude that BT has SMP in BT exchanges where BT and one other PCO is present (BT+1).

#### Proposed finding that BT does not have SMP in ‘BT + 2 or more’ exchanges

- 7.71 In BT exchanges where at least BT and two other PCOs are present, customers have more choice of supplier and there is likely to be more competition. There is evidence to suggest that BT faces more competitive pressure where more PCOs are present. In an internal document, Openreach notes “[REDACTED]”.<sup>202</sup>
- 7.72 We also understand that contracts for connections into BT exchanges are often done by competitive tender. Information from providers suggests that customers typically seek three bids to obtain a competitive price.<sup>203</sup> [REDACTED].
- 7.73 We consider that although collusion can still occur with three competitors, the ‘lumpy’ nature of demand and the signing of long-term contracts can mean it is less viable. We also note that the behaviour of customers in tending to seek three bids suggests they see that as sufficient. For bids for circuits where at least three competitors are available it is likely that there will be more intense price competition, compared to BT+1 sites. More intense price competition is likely because the winning bid does not only need to slightly undercut the BT price, but also offer a better bid than the additional competitors.
- 7.74 Evidence supplied by Sky indicates that [REDACTED] from BT to connect between BT+2 (or more) exchanges. Instead Sky [REDACTED]. Evidence supplied by TalkTalk is [REDACTED]. The evidence also indicates overall where alternative PCOs are available TalkTalk does use them. Virgin Media supplies [REDACTED]% of TalkTalk’s leased lines and it also purchases circuits from [REDACTED].
- 7.75 We have also taken into account that there are still high barriers to entry to establishing new presence at a BT exchange. However, we consider that the greater choice of PCO, the

<sup>201</sup> Based on connecting to and from a BT+1 exchange to a BT+1 or BT+2 or more.

<sup>202</sup> BT internal documents, [REDACTED].

<sup>203</sup> BT response to 2015 BCMR Consultation, paragraph 13.45, published at: [https://www.ofcom.org.uk/data/assets/pdf\\_file/0016/42415/bt\\_part\\_b.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0016/42415/bt_part_b.pdf).

fact collusion is less likely and BT's low share of supply to some fixed broadband operators support a no SMP finding in BT+2 exchanges.

## Summary of SMP assessment

- 7.76 Having proposed a list of PCOs, we consider that direct and indirect connections both provide a sufficient constraint on BT and therefore should be treated in the same manner. We further consider that as long as PCOs have a policy to wholesale, they impose a competitive constraint on BT.
- 7.77 We propose that BT has SMP for CI inter-exchange connectivity at BT exchanges where it is the only provider of inter-exchange connectivity (BT Only) or where there is only one rival PCO present (BT+1). We propose that BT does not have SMP for CI inter-exchange connectivity at BT exchanges where two more rival PCOs are present (BT+2 or more).
- 7.78 We propose to apply the BT+2 threshold to all BT exchanges. This leads to some changes to current regulation, which is summarised in the table at the end of this section and set out in full at Schedule 6 of our draft legal instrument.

## Three-criteria test

### Background

- 7.79 The three-criteria test is used to assess whether a particular market not listed in the 2014 EC Recommendation is susceptible to *ex ante* regulation.
- 7.80 As the trunk segment of leased lines is not on the list of recommended wholesale markets, we have used the three-criteria test to assess whether it is appropriate to apply *ex ante* regulation to the BT exchanges in the CI Inter-exchange connectivity market.
- 7.81 As noted in the 2014 EC Recommendation, the three criteria are:
- the presence of high and non-transitory barriers to entry. These may be of a structural, legal or regulatory nature;
  - a market structure which does not tend towards effective competition within the relevant time horizon. The application of this criterion involves examining the state of competition behind the barriers to entry; and
  - the insufficiency of competition law alone to adequately address the market failure(s) concerned.
- 7.82 As we noted above, we can only impose regulation in circumstances where we find SMP *and* where the three-criteria test is satisfied. Therefore, we take as our starting point the BT exchanges at which we have found SMP and consider whether these satisfy the three-criteria test. This is consistent with the approach set out in the 2014 EC Recommendation, which states that “NRAs might find that certain trunk routes fulfil the three criteria and thus warrant *ex ante* regulation”.<sup>204</sup>

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<sup>204</sup> Explanatory Note to the 2014 EC Recommendation, page 50.

### High and non-transitory barriers to entry

- 7.83 The Explanatory Note to the 2014 EC Recommendation details what the European Commission considers are relevant factors to assess whether a market has high barriers to entry.
- 7.84 We consider that BT exchanges exhibit high and non-transitory barriers to entry. Specifically, there are significant structural barriers to new entry. There are significant sunk costs involved to a new entrant wanting to build an inter-exchange connectivity network, as this would require investment in fibre networks and digging over large distances, as explained above. In addition, BT has significant economies of scale in the provision of inter-exchange connectivity. Its large and deep network gives it a number of advantages over a new entrant, including diversity, availability and network coverage. We further note that to compete with BT, the entrant would need to build a sufficiently large footprint in the UK. We note that some existing competitors consider they are unable to provide a competitive offer to customers from BT exchanges and are therefore not able to compete in this part of the market.<sup>205</sup>
- 7.85 These same barriers were present in previous reviews, and we see no clear evidence that underlying conditions are likely to change over this review period. We are not aware of any prospective entrants to the BT Only and BT+1 exchanges that would impose a significant competitive constraint on BT.

### A market structure which does not tend towards effective competition

- 7.86 We consider that the BT Only and BT+1 exchanges we have identified will not, in the absence of regulation, tend towards effective competition in the foreseeable future.
- 7.87 As we set out above, BT's market power is significant and entrenched. The extent of BT's market power has not materially changed since the last market review. Currently, 191 BT exchanges are not regulated out of approximately 5,600 BT exchanges across the UK. In this market review, on the basis of a different competitive threshold, we have proposed that 545 BT exchanges should not be regulated. However, we do not consider that this increase in the number of competitive exchanges is evidence that that CI inter-exchange connectivity as a whole is becoming more competitive. Rather, this increase in the number of competitive exchanges, as compared with the Temporary Conditions, is a result of the following:
- we have lowered the threshold for finding that an exchange is competitive. Under the Temporary Conditions, an exchange was considered competitive if BT+3 or more PCOs (either directly or indirectly connected) were present; and/or if BT+2 directly connected PCOs were present. Now, our threshold for finding an exchange competitive is BT+2 (either directly or indirectly connected) PCOs are present. This means that exchanges with two indirectly connected PCOs, or with one indirectly connected PCO

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<sup>205</sup> In response to 3<sup>rd</sup> BCMR s.135 notice, [Redacted].

and one directly connected PCO, are now considered competitive. Our reasons for changing this threshold are explained above; and

- we have identified a significant number of additional exchanges at which Vodafone is present with its fibre and able to provide inter-exchange connectivity services. Previously, we were not aware that [X]. This has substantially increased the number of exchanges where we consider Vodafone to be present [X] and has substantially increased the number of exchanges at which BT+2 PCOs are present [X] to 545 BT exchanges.

7.88 We are also not aware of factors that may materially reduce the barriers to entry we have identified. For instance, we are not aware of any technological developments that will change competitive conditions in this market in the foreseeable future.

### Insufficiency of competition law

7.89 In this market, we consider that barriers to entry will persist and it will not tend towards competition within the relevant time horizon. We therefore turn to the question of whether competition law alone is sufficient to address market failures at the relevant BT exchanges.

7.90 Our main competition concerns in relation to BT Only and BT+1 exchanges are as follows:

- the importance of CI inter-exchange services at these exchanges to the state of competition in CI Access;
- the risk of excessive pricing of CI inter-exchange connectivity services which could result in high prices for end-users; and
- the unlikelihood that competitors will build to these sites.

7.91 We do not consider *ex post* competition law would be sufficient to address these concerns, for the following reasons:

- given the unlikelihood of competitors building to these exchanges, we consider some form of network access obligation – which is not an available remedy under competition law – is required to ensure effective competition;
- the need for timely and efficient intervention to avoid adverse effects on those providing services in the CI Inter-exchange connectivity and CI Access markets as well as the end-users of leased lines;
- if BT engaged in the behaviour mentioned above, there could be long-term or irreversible damage to competition in the markets;
- *ex ante* regulation provides clarity and certainty to BT and to other providers of leased lines; and
- the response to anti-competitive behaviour may not be sufficient to prevent harm in certain circumstances.

7.92 For these reasons, in this instance, we consider that competition law would not be sufficient by itself to address concerns in BT Only and BT+1 exchanges and therefore *ex ante* regulation is necessary to maintain effective competition.

## Conclusion

7.93 We consider that the BT exchanges in which we propose that BT has SMP pass the three-criteria test and therefore are susceptible to *ex ante* regulation. We therefore propose to regulate these BT exchanges.

## Provisional conclusions

- 7.94 We propose that there is a single product market for CI Inter-exchange circuits for all bandwidths and each BT exchange is its own geographic market.
- 7.95 We propose to focus on the presence of PCOs in establishing which BT exchanges BT has SMP. We propose that BT has SMP in:
- BT exchanges where only BT is present (BT Only), of which there are 4,327; and
  - BT exchanges where only BT and one other PCO are present (BT+1), of which there are 701.
- 7.96 We propose BT does not have SMP at BT exchanges where there are two or more PCOs present (BT+2 or more). We propose that 545 BT exchanges are not characterised by SMP.<sup>206</sup> As noted in Annex 15, the number of BT exchanges where we find BT does not have SMP may change as we gain greater clarity around the use of “BT Egress”<sup>207</sup> and other external cablelink variant sales from BT (primarily BT Enterprise).
- 7.97 The BT exchanges at which we propose to not find SMP include some that we do not currently regulate (75 from the Existing Core and 94 that we deregulated in the Temporary Conditions). They also include 376 BT exchanges that are currently regulated, but where we do not now consider that BT has SMP on the basis of our BT+2 threshold.
- 7.98 The BT exchanges at which we propose to find SMP include some exchanges that are not currently regulated. We propose to re-regulate a small number of exchanges from the Existing Core, which were deregulated in the 2009 BCMR Statement. The decision to deregulate these exchanges was based mainly on the existing TI network at that time and not a competitive presence test. Having applied the competitive presence test to these exchanges, our analysis indicates that there are nine such exchanges in which BT has SMP. Hence, we intend to apply regulation to these exchanges. We also propose to re-regulate 13 exchanges that were deregulated in the Temporary Conditions.
- 7.99 We propose that, on the basis of the three-criteria test, those exchanges at which BT has SMP are susceptible to *ex ante* regulation.
- 7.100 In our legal instrument we have defined two broad markets for the purpose of imposing regulation.<sup>208</sup> Those markets are:

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<sup>206</sup> Given the large number of BT exchanges, we find it convenient to identify those sites we in which we do not find SMP.

<sup>207</sup> “BT Egress – External” is another legacy variant of External Cablelink.

<sup>208</sup> In effect, these two markets aggregate BT exchanges in which competitive conditions are sufficiently homogeneous.

- The market for CI inter-exchange connectivity at BT+2 or more exchanges (in which we do not find SMP). In our draft legal instrument we refer to this as the “Wholesale market for CI Inter-exchange Connectivity Services along Competitive IEC Routes”; and
- The market for CI inter-exchange connectivity in the rest of the UK (in which we find SMP). In our draft legal instrument we refer to this as the “Wholesale market for CI Inter-exchange Connectivity along Non-competitive IEC Routes”.

7.101 A full list of BT Only, BT+1 and BT+2 or more exchanges can be found at Schedule 6 of our draft legal instrument.

**Table 7.6: BT exchanges**

	Current regulation	Proposed regulation
“Existing core”	84 exchanges not regulated	75 exchanges not regulated
Additional exchanges at 2017 TCs	107 exchanges not regulated	94 exchanges not regulated
Proposed additional exchanges	n/a	376 exchanges not regulated
Total	191 exchanges not regulated	545 exchanges not regulated

## Consultation questions

Question 7.1: Do you agree with our assessment of inter-exchange connectivity? Please provide evidence to support your views.

Question 7.2: Do you agree with the proposed market definition? Please provide evidence to support your views.

Question 7.3: Do you consider that our list of BT exchanges for deregulation is correct? Please provide evidence to support your views.

Question 7.4: Do you agree with our list of Principal Core Operators (PCOs)? Please provide evidence to support your views.

## 8. Traditional interface services

- 8.1 This section outlines our proposals in relation to traditional interface services up to and including 8 Mbit/s (low bandwidth TI services).
- 8.2 In this section we:
- provide background information on traditional interface (TI) services, including our regulatory approach;
  - summarise our approach to market definition for low bandwidth TI services;
  - outline the evidence we have considered in reaching our proposed market definition; and
  - revisit our 2016 assessment that *ex ante* regulation for low bandwidth TI services is appropriate, given our duties to regulate only where necessary. The framework we use to do this is the three-criteria test.
- 8.3 Having considered the evidence available to us, we provisionally conclude that:
- low bandwidth TI services constitute a separate market for the period of this review, but there are clear dynamics in this rapidly declining market that suggest effective competition will be reached in the foreseeable future; and
  - the second criterion of the three-criteria test is not satisfied based on the available evidence (see point above), and therefore *ex ante* regulation is no longer justified for these services.

### Background

- 8.4 TI leased lines use legacy analogue and digital interfaces.<sup>209</sup> There are two broad types of circuit in this category:
- analogue interface leased lines: These are commonly used for voice transmission, e.g. external extension circuits between business sites. They are also used for low-bandwidth data transmission; and
  - digital interface leased lines: These are based on legacy SDH/PDH technology, itself based on time-division multiplexing (TDM). They have stable and predictable transmission characteristics, low transmission delay (latency) and low jitter (variation in transmission delay). These characteristics are important in some user applications.
- 8.5 Demand for TI services is in decline. As discussed below, almost all new demand for leased lines services is met by more modern alternatives. As TI circuits are a legacy service, we do not expect significant new demand, new entry or competition within the TI segment.

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<sup>209</sup> TI circuits provide access connections between end-user sites and an aggregating node, as described in Section 3.

- 8.6 These services are also increasingly being supported by ageing and often obsolete equipment. For example [REDACTED]:
- some parts are no longer available from suppliers, with ‘last time buy notifications’ being provided for some equipment<sup>210</sup>; and
  - external support and/or repair of some equipment is no longer available, resulting in the need to identify suitable alternatives (where available) or repairing the equipment itself, where it is viable and where there are the appropriately skilled staff to do so.<sup>211</sup>
- 8.7 This means that the risk of service outages affecting businesses is increasing.<sup>212</sup>
- 8.8 We have been progressively deregulating TI services. In the 2016 BCMR we concluded that for wholesale TI services operating at bandwidths above 8 Mbit/s (medium and high bandwidth TI), *ex ante* regulation was no longer appropriate as this market no longer met the three-criteria test.<sup>213</sup> In reaching this conclusion we noted that:
- the current installed base of high bandwidth TI circuits was low and was predicted to fall further as customers switched to Ethernet services, demonstrating that Ethernet had become a cheaper and acceptable substitute;
  - the availability of Ethernet services would provide a sufficient constraint on the prices of higher bandwidth TI circuits above 2 Mbit/s; and
  - the market failures we identified in the medium (above 8Mbit/s up to and including 45 Mbit/s) and high (above 45 Mbit/s up to and including 155 Mbit/s) TI markets in the 2013 BCMR, which arose from a finding of SMP and for which extensive or frequent and timely intervention was previously considered indispensable, were found to be no longer present in the 2016 BCMR.<sup>214</sup>
- 8.9 However, for low bandwidth TI services, we determined that users would not necessarily switch if there was a SSNIP and that BT had SMP.<sup>215</sup> We also noted that:
- migration rates were not sensitive to price changes and customers remaining on these services were unlikely to be adequately protected from an operator with SMP;
  - switching costs were a barrier to switching to Ethernet – a specific concern was the cost of changing end-user equipment; and
  - some legacy and specialist applications would continue to require TI leased lines.<sup>216</sup>

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<sup>210</sup> [REDACTED]

<sup>211</sup> [REDACTED]

<sup>212</sup> [REDACTED]

<sup>213</sup> 2016 BCMR, Volume 1, paragraph 5.67.

<sup>214</sup> 2016 BCMR, Volume 1, paragraph 5.69 - 5.70.

<sup>215</sup> 2016 BCMR, Volume 1, paragraph 5.35.

<sup>216</sup> As part of that discussion, we considered that some legacy and specialist applications would continue to require TI leased lines as Ethernet services could not exactly match all the characteristics of SDH/PDH services (which are forms of TI leased lines), such as latency and jitter, to the very high specification across all network load scenarios. We also noted that these differences were becoming progressively less important as mainstream enterprise applications migrate to Ethernet/IP technologies and are therefore able to use Ethernet leased lines. See 2016 BCMR, Volume 1, paragraph 5.31 to 5.44.

- 8.10 For these services, in the UK excluding the Hull Area, we retained a remedy called the PPC Direction.<sup>217</sup> We considered this was necessary to ameliorate the risk that BT would refuse access at the wholesale level or would offer terms that would not meet telecoms providers' requirements.<sup>218</sup> Due to the low demand for new circuits, we amended the PPC Direction by (among other things) removing the requirement for forecasts for PPCs.<sup>219</sup> This remedy was in addition to the general remedies that we set.<sup>220</sup>
- 8.11 TI services are also subject to CPI-X charge control ending on 31 March 2019.<sup>221</sup> Figure 8.1 (below) provides a summary of this control and the relevant starting charge adjustment for low bandwidth TI services.

**Table 8.1: Summary of the low bandwidth TI control and the relevant starting charge adjustment**

Basket	BT product name	Starting charge adjustment	Value of X
TI basket		-7.5%	CPI-3.5%
<i>Sub-baskets/sub-caps:</i>			
2 Mbit/s RBS and SiteConnect sub-basket	2 Mbit/s Radio Base Station (RBS) services and SiteConnect	-7.5%	CPI-3.5%
Sub-cap on interconnection services	PPC and RBS point of handover charges		CPI-CPI
Sub-cap on all non-interconnection charges	All TI services (excluding interconnection services)		CPI+8%

Source: 2016 BCMR, Volume 2, page 2.

- 8.12 As set out in Section 2, our approach to TI services were not affected by the Tribunal's findings. Current regulation of the wholesale low bandwidth TI market remains as specified in the 2016 BCMR.

<sup>217</sup> The PPC Direction was first introduced in 2002. It specifies detailed requirements for the provision and repair of PPCs and RBS backhaul including: (1) migration arrangements (for migration of retail private circuits to PPCs); (2) forecasting arrangements for capacity ordering; and (3) Service Level Agreements (SLAs) including provision and repair performance targets and service level guarantee (SLG) payments.

<sup>218</sup> We considered that not applying this would allow BT to favour its own retail operations with the effect of distorting competition in the corresponding downstream markets until such a time as end-users have migrated to alternative services.

<sup>219</sup> 2016 BCMR, Volume 1, paragraph 11.23.

<sup>220</sup> Further information on the general remedies is available in section 8 of the 2016 BCMR, Volume 1.

<sup>221</sup> 2016 BCMR, Volume 2, pages 16-17.

- 8.13 Separate to our wholesale assessment, we lifted retail regulation for very low bandwidth (VLB) retail services (below 2 Mbit/s).<sup>222</sup> For this market we determined that *ex ante* regulation was not required as the three-criteria test was not satisfied and that:
- users could migrate to alternative services and would increasingly do so over the next three years;
  - BT was managing an orderly process of service withdrawal of VLB leased lines; and
  - further protection was to be provided by regulation of the related upstream wholesale low bandwidth TI market, which was to remain in place.<sup>223</sup>

## Product market

- 8.14 As low bandwidth TI services are the only TI service still regulated, we have restricted our market definition exercise to low bandwidth TI services. The main purpose of the product market definition is to identify the competitive constraints (both from the demand- and supply-side) on low bandwidth TI services. Given this is a legacy market that is in decline, our focus is primarily on demand-side substitution.
- 8.15 We use the SSNIP test as our conceptual framework for assessing demand-side constraints on low bandwidth TI services. It starts by selecting a suitable focal product and asks whether a hypothetical monopolist would be able to profitably impose a SSNIP above the competitive price level on that focal product. In the context of this review, the question we are trying to answer is whether a sufficient number of low bandwidth TI customers would switch to an alternative product in the event of a SSNIP to render the price increase unprofitable. If enough customers would switch, the relevant market should be expanded to include the alternative product.
- 8.16 We address this question in the same way as for CI Access services. Namely, we assess whether the amount of switching expected because of the SSNIP is likely to exceed the critical loss threshold. Based on cost data from BT's 2016/17 RFS, we estimate this critical loss to be 18%<sup>224</sup> for low bandwidth TI services.
- 8.17 In conducting the SSNIP analysis we have considered that the demand for wholesale TI services derives from demand for retail TI services. We do this by assuming that price increases at the wholesale level would be passed on to retail customers and then assessing how these customers are likely to respond to such price increases. We have also taken a modified greenfield approach, by which we assume there are no *ex ante* SMP remedies in place for TI services, but *ex ante* SMP remedies in other markets continue to apply.
- 8.18 The evidence we have considered to inform our SSNIP analysis includes:
- the demand for low bandwidth TI services;
  - prices for low bandwidth TI services and Ethernet; and

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<sup>222</sup> 2016 BCMR – Very low bandwidth leased lines.

<sup>223</sup> 2016 BCMR, Volume 1, paragraphs 5.31-5.44.

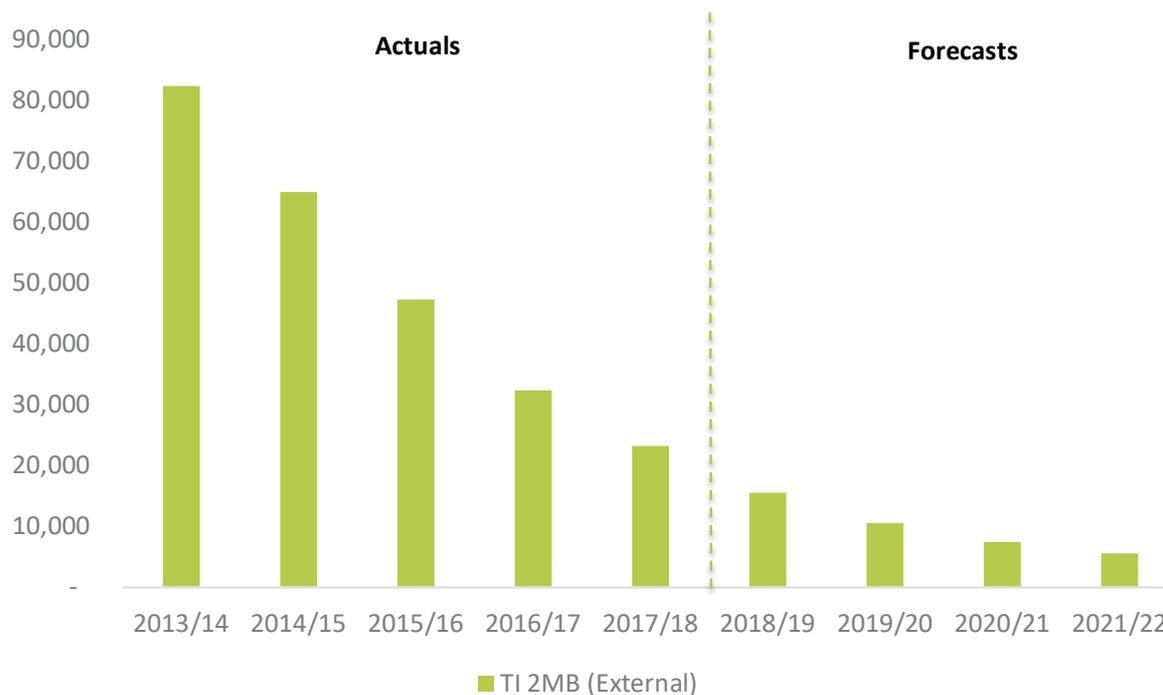
<sup>224</sup> Ofcom analysis based on Openreach RFS data and BT volume forecasts submitted in response to question 11 of our LLCC s.135 notice dated 2 February 2018.

- qualitative factors.

## Demand for low bandwidth TI services

8.19 Demand for low bandwidth TI services has declined rapidly and is expected to continue to decline over the review period (see Figure 8.2).<sup>225</sup>

**Figure 8.2: Decline in low bandwidth TI services volumes**



Source: BT RFS and BT response to question 11 of the LLCC 1<sup>st</sup> s.135 request notice dated 2 February 2018

8.20 This decline is supported by evidence gathered through our stakeholder engagement. For example, BT indicated that:

- it observed decreasing demand for TDM services as customers switch to newer alternative technologies which offer lower transport costs and greater flexibility, such as Ethernet services delivered over copper and fibre; and
- businesses need to be agile and adaptable, future proofing themselves for new applications and needs. Customers are increasingly moving away from fixed end-to-end dedicated capacity to a network solution which offers greater flexibility. Newer Ethernet and IP technologies offer a wider range of access types and increased

<sup>225</sup> Figure 8.2 actuals are based on BT's RFS volume data for external services. As we understand that there are no BT products between 2 Mbit/s and 8 Mbit/s. This figure is based on 'local end' volumes data for BT's 2 Mbit/s services.

bandwidth granularity to tailor the service to a users' needs along with efficient multisite networking.<sup>226</sup>

- 8.21 Verizon similarly indicated that TI volumes were falling but this had a lot to do with business closures.<sup>227</sup> It also noted that where customers are moving to depends on what they need and that:
- EFM is fine for 10 Mbit/s and below if the customer is close to the exchange, but if too far away, an alternative to this service is required; and
  - FTTC is a good substitute, but coverage is constraining take up which is a concern.
- 8.22 Vodafone indicated that “customers are tending to cease their use [of TI] either when they have a technology upgrade or when they churn to a new supplier”.<sup>228</sup>
- 8.23 An analysis carried out by Openreach in 2015 estimated that at that time a significant number of users ([REDACTED]%) ceased using legacy services rather than migrating to other services. However, of those TI users that did migrate [REDACTED]% moved to CI services, while the remainder migrated to EFM and asymmetric broadband.<sup>229</sup>
- 8.24 Based on the evidence on demand for low bandwidth TI services outlined above, our preliminary view is that in the event of a SSNIP we are, notwithstanding the reluctance of some users to switch (see discussion on qualitative factors below), likely to see some switching. However, we also recognise this as a rapidly declining market and expect to continue to see a number of users ceasing circuits without migrating to an alternative service over the duration of this review.

## Pricing

- 8.25 Our pricing analysis (see Figure 8.3) shows that over the last few years, prices of TI 2 Mbit/s circuits have been relatively stable,<sup>230</sup> but the gap with prices of Ethernet-based circuits has narrowed as the latter have fallen rapidly:<sup>231</sup>
- 8.26 Figure 8.3 shows that the relative price difference between TI 2 Mbit/s (10km) and EAD 100 Mbit/s (10km) has dropped from 52% in 2015 to 46% in 2017 and is currently 37% (2018). We expect this narrowing will continue, not least if prices for TI need to increase should the costs of maintaining this legacy platform be spread over a diminishing customer base (recognising that efficiency improvements in this area are unlikely). TI users would therefore have increasingly strong incentives to migrate to alternative services.

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<sup>226</sup> BT, 21 February 2018, BCMR: Future of TI services and legacy networks powerpoint presentation, slide 3.

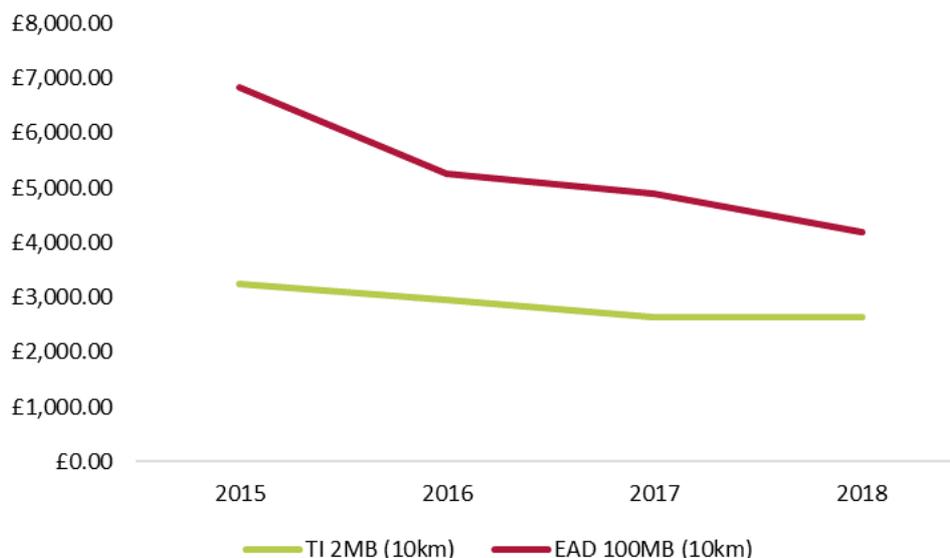
<sup>227</sup> Meeting with Verizon and Ofcom, 12 April 2018, Verizon comments at meeting.

<sup>228</sup> Vodafone, Securing Competition & Market Growth, Line Charge Control Design Considerations 2019 -2022, Slide 6.

<sup>229</sup> Openreach, Ethernet Migration Analysis Update, 30 July 2015.

<sup>230</sup> We are considering prices for 2 Mbit/s only as we understand that there are no BT products between 3 and 8 Mbit/s.

<sup>231</sup> Our analysis also shows that TI services at higher bandwidths are more expensive than Ethernet services (while also (typically) providing a smaller range of possible services).

**Figure 8.3: Prices for 2 Mbit/s vs. 100 Mbit/s EAD**

Source: Ofcom analysis based on Openreach list prices. Prices reflect the annualised total cost of ownership over a three-year period. This cost includes rental and connection charges as well as Main Link charges. Connection charges are spread over the three-year period and discounted at a 9% rate.

8.27 The decrease in price differential between low bandwidth TI services and EAD, combined with the possibility that prices for low bandwidth TI users may increase as volumes decline, suggests that users of these services may be more likely to switch in response to a SSNIP.

### Qualitative factors relevant to demand-side substitution

8.28 This section addresses qualitative factors which may be relevant to users' behaviour in response to a SSNIP on low bandwidth TI services.

8.29 In the 2016 BCMR, we noted that while most TI users are expected to eventually switch to Ethernet, some users may be reluctant to switch in the short term due to, among other factors, them placing a greater weight on particular characteristics of TI services. For example, we highlighted that Ethernet services could not exactly match all of the characteristics of TI services, such as latency and jitter, to the very high specification and across all network load scenarios – see Table 8.4 below.

**Table 8.4: Comparison of key point-to-point Ethernet leased line service and SDH/PDH features**

Feature	Point-to-point Ethernet	SDH/PDH
Contention	Dedicated	Dedicated
Distance limitations (fibre delivered)	Not limited	Not limited
Jitter	Low (load dependent)	Low

Feature	Point-to-point Ethernet	SDH/PDH
Latency	Low (load dependent)	Low
Resilience	High	High
Symmetry	Symmetrical	Symmetrical
Synchronisation	Networks supporting resilient synchronisation deployed, but not supported by some older carrier Ethernet services	Networks support resilient synchronisation of end-user equipment natively.

Source: 2015 BCMR Consultation.

8.30 We also highlighted that:

- the Explanatory Note to the 2014 EC Recommendation had indicated that carrier-grade Ethernet services were a substitute for all but the most demanding business applications;<sup>232</sup> and
- BCRC survey evidence suggested that 79% of those with analogue or SDH/PDH leased lines had no concerns about replacing them with Ethernet.<sup>233</sup> The key concerns for the remaining users were inadequate service level agreements (7%) and reliability (6%).

8.31 Whilst we noted that a high proportion (79%) of respondents said that they had no concerns about replacing them with Ethernet, we recognised that this did not mean that those respondents would switch in response to a SSNIP (or indeed in any circumstances); it may be that respondents had just not thought about switching.<sup>234</sup>

8.32 Since publishing the 2016 BCMR we have engaged with the sector to further develop our understanding of the reasons why users of low bandwidth TI services keep using the service or switch.

8.33 Consistent with the evidence summarised above, our more recent engagement with the sector suggests that:

- many users of low bandwidth TI remain satisfied with the level of service they receive and are not inclined to switch; and

<sup>232</sup> Explanatory Note to the 2014 EC Recommendation, page 49.

<sup>233</sup> Ofcom, 2015. *Business Connectivity Services Review* (2015 BDRC study), [https://www.ofcom.org.uk/data/assets/pdf\\_file/0026/57491/bcmr\\_2014\\_report-bdrc.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0026/57491/bcmr_2014_report-bdrc.pdf), quoted in 2016 BCMR, Volume 1, para. 5.26.

<sup>234</sup> Only a quarter (24%) of TI leased line users surveyed had actively considered switching to Ethernet leased lines and only around half of these (13%) said that they intended to do so at the end of their current contract while the rest (11%) had decided against it. Around a third of those that had not considered switching said they were likely to consider it in the future (35%). See 2016 BCMR, Volume 1, paragraph 5.26.

- for the users who are considering switching, the timing of any switch will typically occur at their own pace, with it often being delayed up to the point where end-user equipment or applications come to the end of their life.
- 8.34 Vodafone, for example, indicated that customers often stay with TI unless they are changing network provider or implementing an IT upgrade.<sup>235</sup> It also noted that “Ethernet migration usually coincides with an IT refresh, however this ideally should be on the customers’ terms, rather than forced upon them, particularly if Communication Providers are able to offer a sustainable service”.<sup>236</sup> Verizon highlighted the example of a customer that was not willing to move as it considered the TI service being provided was not broken and was therefore not in any rush to upgrade.<sup>237</sup>
- 8.35 Other stakeholders highlighted that without an appropriate push factor – such as the announcement of platform closure – some users may retain their current service for some time. For example, the Office of the Telecommunications Adjudicator noted that if BT decided to stop supplying [giving normal notice period of 2 years] then that would be an inflection point – and from that point faster migration would be likely.<sup>238</sup> Verizon similarly noted that in other sectors, both domestic and international, that a firm closure date from the incumbent/regulator would facilitate migration.<sup>239</sup>
- 8.36 Our recent engagement also identified that the level of switching away from low bandwidth TI services would be influenced by:
- the cost of switching;
  - the perceived reliability and versatility of low bandwidth TI services; and
  - Ethernet coverage (the presence of which being a pre-requisite to switching).
- 8.37 Vodafone noted, for example, that the reasons for this continuing loyalty for PPCs does not stem from apathy towards change, rather it is for sound practical and economic reasons, with PPCs continuing to suit their business needs more than any connectivity solution at this point in time.<sup>240</sup> It also noted (among other issues):
- a switch to Ethernet may drive unnecessary costs, necessitating the need for a full IT refresh that is not required at this point in time, especially when there is a view that the existing kit is performing well;
  - PPCs are viewed as a reliable connectivity solution, being dependable and user friendly;
  - PPCs are versatile: While copper circuits ultimately limit PPC speeds, it does have the benefit of enabling PPCs to provide a flexible solution with resilience configuration choices that suit individual business needs;

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<sup>235</sup> Meeting with Ofcom and Vodafone, 5 March 2018, Vodafone comments re LLCC.

<sup>236</sup> Vodafone’s response to the 6<sup>th</sup> s.135 notice, page 12.

<sup>237</sup> Meeting with Ofcom and Verizon, 12 April 2018, Verizon comments.

<sup>238</sup> Meeting with Ofcom and Office of the Telecommunications Adjudicator, 16 April 2018, OTA2 comments.

<sup>239</sup> Meeting with Ofcom and Verizon, 12 April 2018, Verizon comments.

<sup>240</sup> Vodafone’s response to the 6<sup>th</sup> s.135 notice, page 11.

- PPCs provide an end to end dedicated circuit as standard: Although Ethernet is a dedicated service, it often relies in part on aggregated routing paths, restricting or at least making diversity and separacy options either impractical or unaffordable; and
  - PPCs have near universal nationwide reach and can continue to operate without major new set-up costs (thereby avoiding the need to self-build or invest in new line plant).<sup>241</sup>
- 8.38 On reliability and versatility, a small number of stakeholders expressed concern with the perceived lower levels of reliability that alternative services to low bandwidth TI services often presented. For example, the Office of the Telecommunications Adjudicator noted that low bandwidth TI is useful for critical national infrastructure and that any potential disruption to communications is therefore of great concern and for some reason the faults with IP seem to be higher.<sup>242</sup> Similarly, [REDACTED] highlighted that it had moved a customer to IP, but because various payment systems did not work it had to purchase 64kb/s PSTN. It also noted that other customers that were dealing with payment systems often had issues with IP and that there were often challenges associated with lifts, such as emergency telephone equipment.<sup>243</sup>
- 8.39 While we consider the suitability of alternative services below, the ongoing reliability of low bandwidth TI services needs to be considered in the appropriate context. This is a declining legacy service that is increasingly being supported by ageing and often obsolete equipment. This means that users of these services will increasingly be exposed to higher levels of risk (unreliability).
- 8.40 BT has, for example, indicated that it is “increasingly difficult to source network equipment based on anything other than Ethernet and IP” and that “spare cards are unavailable and parts have not been manufactured for some time”.<sup>244</sup> BT also identified several other factors that will impact the reliability of low bandwidth TI services (and the cost to serve) in future, including:
- expertise to maintain the TDM network, which is becoming increasingly scarce;
  - lack of vendor support, e.g. knowledge of equipment, equipment updates; and
  - limited investment in associated management systems for older equipment.<sup>245</sup>
- 8.41 On the unsuitability of alternative services, we note the concerns raised by some stakeholders but also note that other stakeholders have suggested that these concerns are diminishing and/or are no longer present. For example, BT suggests that changes in customer demand and product innovation have resulted in viable alternatives to low

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<sup>241</sup> [REDACTED]

<sup>242</sup> Meeting with Ofcom and Office of the Telecommunications Adjudicator, 16 April 2018, OTA2 comments.

<sup>243</sup> Meeting with Ofcom and [REDACTED], 12 April 2018, [REDACTED] comments.

<sup>244</sup> BCMR: Future of TI services and legacy networks, BT–Ofcom meeting, 21 February 2018, in confidence between BT and Ofcom, slide 8.

<sup>245</sup> BCMR: Future of TI services and legacy networks, BT –Ofcom meeting 21 February 2018, In confidence between BT and Ofcom, slide 8.

bandwidth TI services that have not have been available in the past.<sup>246</sup> This means that there is now a range of alternatives available widely across the UK, that can replicate and/or substitute for the full portfolio of TI technologies. For example:

- Ethernet services have developed to offer an evolution path for a wide range of legacy business products based on TDM technologies such as PDH and SDH;
- where there are no direct Ethernet-based substitutes, there are equivalent Ethernet-based voice and data services available; and
- GEA<sup>247</sup> may also be a substitute for some customers/applications.

8.42 A summary of the evidence submitted by BT that supports this position is outlined in Table 8.5 below.<sup>248</sup>

**Table 8.5: Comparison of service features for PPCs, Ethernet, and broadband**

Service Feature	PPC <sup>249</sup>	Point-to-Point Ethernet (carrier class) <sup>250</sup>	National Ethernet Fibre <sup>251</sup>	National Ethernet EFM/ GEA <sup>252</sup>	Broadband Access (FTTC) <sup>253</sup>
Contention	Dedicated	Dedicated	Dedicated	Dedicated	Shared
Distance Limitations	Not Limited	Not Limited	Not Limited	Not Limited	Not Limited
Service Availability	99.85%	99.93%	99.93%	99.93%	n/a
Coverage	99%	99%	99%	EFM 82% GEA 73%	73%
Symmetry	Symmetric	Symmetric	Symmetric	Symmetric	At least 2M each way
Price	£2,800	£4,200	£[Redacted]	£[Redacted]	£240

<sup>246</sup> BCMR: Future of TI services and legacy networks, BT –Ofcom meeting 21 February 2018, In confidence between BT and Ofcom, slide 6.

<sup>247</sup> Generic Ethernet Access (GEA) generally refers to Openreach FTTP (Fibre To The Premise) and FTTC (Fibre To The Cabinet) products.

<sup>248</sup> BCMR: Future of TI services and legacy networks, BT –Ofcom meeting 21 February 2018, In confidence between BT and Ofcom, slide 5.

<sup>249</sup> PPC based upon 2km MLD (current average MLD across installed base –15km terminating, 4km regional trunk, 2km national trunk).

<sup>250</sup> Point to point EAD assumes 10km MLD excludes connection charge £1,925 also there is currently offer of £656 which expires 31/3/18.

<sup>251</sup> National Ethernet Fibre assumes 2 Mbit/s on 100 Mbit/s Etherway LA service (3 year term free connection).

<sup>252</sup> EFM assumes 2Mbit/s on 3 pairs (3 year term free connection) and GEA 2Mbit/s on 80:20 Etherway.

<sup>253</sup> Broadband Access typical bandwidth inclusive price is £18-20 per month -£54 connection charge not shown.

Service Feature	PPC <sup>249</sup>	Point-to-Point Ethernet (carrier class) <sup>250</sup>	National Ethernet Fibre <sup>251</sup>	National Ethernet EFM/ GEA <sup>252</sup>	Broadband Access (FTTC) <sup>253</sup>
Connection	£2,217	£1,925 (£656)	£0	£0/£300	£54

8.43 [Redacted] similarly recognised that [Redacted]. However, it recognised that this would [Redacted].<sup>254</sup> For example, it noted that [Redacted].<sup>255</sup>

8.44 Our engagement also suggests that some of the costs previously seen when switching may be lessening due to changes in the market. For example, [Redacted] indicated that while [Redacted].<sup>256</sup> [Redacted] has similarly indicated that if a specific user does not want to [Redacted].<sup>257</sup>

8.45 Having carefully considered the qualitative factors outlined above, and applying our regulatory judgement, we consider that the evidence suggests that:

- although the number of low bandwidth TI services users is declining, the remaining low bandwidth TI users are likely to be those who are most satisfied with the level of service they receive and thus least inclined to switch, even in the event of a SSNIP;
- in the absence of any strong external factor encouraging migration, many of these users will continue to switch at their own pace, with that typically being where end-user equipment or applications come to the end of their life; and
- there are conflicting views about the ability of more modern services to substitute for the full range of low bandwidth TI services but, based on the evidence available to us, we consider that these modern services can: (1) represent a viable alternative; (2) have sufficient coverage to be considered an appropriate alternative for the majority of users; and (3) will increasingly be available at a price and service point appropriate for current users of low bandwidth TI services.

## Provisional conclusions on product market definition

8.46 We consider that, notwithstanding there being greater convergence and an increased ability to switch to Ethernet leased line services, it is unlikely that more than 18% of low bandwidth TI customers would switch in the event of a SSNIP and render the SSNIP

<sup>254</sup> [Redacted]

<sup>255</sup> [Redacted]

<sup>256</sup> [Redacted]

<sup>257</sup> [Redacted]

unprofitable. We therefore consider that the evidence suggests that a separate product market for low bandwidth TI services is likely to be present for the period of this review.

## Geographic market

8.47 In the 2016 BCMR, our analysis suggested that competitive conditions were largely homogenous across the UK (excluding the Hull Area), on the basis that BT had a very high market share (significantly greater than 50% across the UK).<sup>258</sup> Our updated March 2018 analysis suggests that this remains the case with BT accounting for the large majority of low bandwidth circuits.<sup>259</sup> We therefore have no reason to believe that the geographic market will have changed.

8.48 We therefore propose that any market for low bandwidth TI services will have a national scope. While we acknowledge that the amount of rival infrastructure is greater in some areas, especially in central London, we do not consider that these variations warrant definition of separate geographic markets.

## Provisional conclusion on market definition

8.49 Having considered all the information outlined above, and having applied our regulatory judgement to those issues, our provisional view is that there will remain a distinct national market (excluding the Hull Area) for low bandwidth TI services for the period of this review. Beyond the period of this review, however, there are clear dynamics in the market that suggest that effective competition will be reached in the foreseeable future. In addition, there is clear evidence that the number of users of low bandwidth TI users is in decline, with evidence suggesting that a significant number of those users (74%) ceased using legacy services rather than migrating to other services. Moreover, of those that did migrate, most moved to CI services.

8.50 Having set out our proposed findings in relation to the relevant market we have then considered whether this declining market remains susceptible to *ex ante* regulation during the relevant period. We do this via the three-criteria test.

## The three-criteria test for low bandwidth TI services

- 8.51 When considering imposing *ex ante* regulation, we must (among other factors):
- define relevant markets appropriate to national circumstances;<sup>260</sup>
  - consider the markets that the European Commission has listed as potentially needing *ex ante* regulation, noting that the market for wholesale high-quality access provided

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<sup>258</sup> 2016 BCMR, paragraph 5.84 and Table 4.4 (showing BT market shares for low bandwidth TI circuits).

<sup>259</sup> 2016 BCMR and analysis of 2017 TI circuit data (using BT RFS and data provided by other telecoms providers).

<sup>260</sup> This must be done in accordance with the principles of competition law and taking utmost account of the 2014 EC Recommendation and EC SMP Guidelines.

at a fixed location (what we refer to as wholesale leased lines) is currently included in this list;<sup>261</sup> and

- recognise that the 2014 EC Recommendation indicates there may be situations where it may not be appropriate to impose *ex ante* regulation.<sup>262</sup>

8.52 To assess whether it is appropriate to impose *ex ante* regulation in a market listed, the 2014 EC Recommendation sets out the following three criteria which must all be met (the three-criteria test) if *ex ante* regulation is to continue:

- the presence of high and non-transitory barriers to entry. These may be of a structural, legal or regulatory nature;
- a market structure which does not tend towards effective competition within the relevant time horizon. The application of this criterion involves examining the state of infrastructure-based and other competition behind the barriers to entry; and
- the application of competition law alone is insufficient to adequately address the identified market failure(s).<sup>263</sup>

## Approach

8.53 In conducting the three-criteria test we have considered several applicable principles in our analysis. These principles are outlined below.

8.54 The 2014 EC Recommendation, recital 15, states, with emphasis added:<sup>264</sup>

“A tendency towards effective competition implies that the market will either reach the status of effective competition absent *ex ante* regulation within the period of review, **or will do so after that period provided clear evidence of positive dynamics in the market is available within the period of review.** Market dynamics may for instance be caused by technological developments, or by the **convergence of products and markets which may give rise to competitive constraints being exercised between operators active in distinct product markets .”**

8.55 The 2014 EC Recommendation Explanatory Note states, with emphasis added:<sup>265</sup>

“... in innovation-driven markets competitive constraints often come from innovative threats from potential competitors that are not currently in the market, and **dynamic or longer-term competition can take place among firms that are, from a static perspective, not necessarily competitors in an existing market.** ... A tendency towards effective competition does not necessarily imply that the market will reach the status of effective competition within the period of review. It simply means that

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<sup>261</sup> 2014 EC Recommendation.

<sup>262</sup> 2016 BCMR, Volume 1, paragraph 5.26.

<sup>263</sup> See Recital 19 to the 2014 BCMR Recommendation.

<sup>264</sup> 2014 EC Recommendation, Recital 15.

<sup>265</sup> Explanatory note to the 2014 EC Recommendation, page 10.

there is **clear evidence of dynamics in the market within the period of review which indicates that the status of effective competition will be reached in the foreseeable future** without ex ante regulation in the market concerned.”

8.56 The EC SMP Guidelines state, with emphasis added:<sup>266</sup>

“Once most customers have switched to a higher performing infrastructure, a group of users may still be using the legacy technology. In this event, **NRAs should take a regulatory approach that does not unduly perpetuate the cycle of captivity** by defining overly narrow markets.”

8.57 We have also considered an EC SMP working paper which states, with emphasis added:<sup>267</sup>

“When the majority of customers have migrated to a modern, higher-performance infrastructure, leaving a captive customer-base stranded on the legacy infrastructure, as is already apparent for low-speed analogue leased lines, the chain of substitution may appear to break, and the market analysis may suggest the finding of separate markets. However, when such an issue is identified, **NRAs should take care that the regulatory approach does not perpetuate a cycle of captivity by continuing regulation of an ever smaller niche market, but rather serves to encourage migration on to modern networks and enables the ultimate switch-off of legacy networks.**”

8.58 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.<sup>268</sup>

## Analysis

8.59 Having considered the principles outlined above, and the evidence used to determine the potential presence of a low bandwidth TI services market, our analysis suggests that low bandwidth TI services are becoming an increasingly unsustainable legacy technology with rapidly declining numbers of customers and no material new demand. Moreover, modern alternatives exist in the form of CI services that are satisfying the demand for the functionality provided by these services and is where the focus of competition now lies.

8.60 BT has recently indicated that it is in the process of reviewing its platform plans but that it does not expect to continue to support TDM data services beyond 2025. This is because the underlying SDH platform which supports TDM data services also supports PSTN and legacy broadband services and:

- legacy broadband services are in the process of being withdrawn; and

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<sup>266</sup> EC SMP Guidelines, paragraph 45.

<sup>267</sup> EC SMP Guidelines, page 19.

<sup>268</sup> Section 6 of the Act.

- it intends to migrate all voice services off the PSTN to an IP based platform by the end of 2025.<sup>269</sup>
- 8.61 Within this context we do not consider it appropriate that regulation should stifle the timely and managed migration away from low bandwidth TI services to more modern platforms.
- 8.62 While we do not consider the evidence suggests that the low bandwidth TI services market is in the same market as the CI services market over the period of the review, there is clear evidence of continued migration from low bandwidth TI services to other markets. We note, for example, that:
- prices are converging, with the price of EAD falling significantly over recent years. While the price for low bandwidth TI services has also fallen, this has been at a much slower rate and there is scope that prices for these services may increase as volumes continue to decline;
  - users of low bandwidth TI services are increasingly reliant on ageing and obsolete equipment, which means that the associated reliability and stability of the low bandwidth TI services will diminish, which will increasingly encourage risk-averse users to migrate to alternative services; and
  - advances in technology mean that there is a range of widely available alternative services that can increasingly replicate and/or substitute for the full portfolio of TI technologies.
- 8.63 We expect that the technological and price convergence outlined above will continue within the period of the review and in the foreseeable future (potentially up to the point that BT withdraws the TI platform). This means that the CI services market will increasingly constrain the low bandwidth TI services market. We therefore believe that in the longer term, the market will tend towards effective competition in the absence of *ex ante* regulation. BT's ability to exploit its market power in this rapidly diminishing legacy market will therefore diminish, as will the need for extensive or frequent and timely intervention previously considered indispensable.
- 8.64 As we consider that there are dynamics in the market which indicate that the status of effective competition will be reached in the foreseeable future, the second criterion of the three-criteria test as set out in the 2014 EC Recommendation is not satisfied.

## Proposals

- 8.65 Considering the analysis set out above, and applying our regulatory judgement, we propose that the cumulative three-criteria test as set out in the 2014 EC Recommendation is no longer satisfied in relation to the low bandwidth TI market.

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<sup>269</sup> BT letter to Ofcom, 3 July 2018. [www.ofcom.org.uk/.../bt-low-bandwidth-wholesale-ti-services.pdf](http://www.ofcom.org.uk/.../bt-low-bandwidth-wholesale-ti-services.pdf).

- 8.66 Based on this provisional conclusion, we do not consider that these services are susceptible to *ex ante* regulation. We are therefore proposing to revoke all conditions imposed on the low bandwidth TI services market (including the PPC Direction<sup>270</sup> and general remedies).
- 8.67 Within this context we note that in July 2018 BT wrote to us<sup>271</sup>, outlining its plans with respect to the ongoing availability, reliability and pricing of these legacy services:
- availability: BT is committed to supporting 2 Mbit/s and above TI services until March 2021 subject to sufficient demand. BT also noted that while it is currently reviewing its platform plans, it does not expect to support TDM services beyond 2025. If withdrawal of these services is announced, BT indicated at least three years' notice will be given and that active dialogue with customers will occur;
  - reliability: BT is committed to supporting this platform on a reasonable endeavours basis to meet the service delivery and quality requirements as set out in its PPC contracts; and
  - pricing: BT has provided an assurance that with volumes declining quicker than costs (as some costs will be incurred until the last circuit is removed), and in the absence of regulation, it will not increase prices by more than CPI+8% per annum.
- 8.68 We have highlighted BT's proposals for reasons of transparency, noting that our proposal on the appropriate regulatory approach for these legacy services has been made consistent with our legislative duties and does not depend on BT's voluntary commitment.

## Consultation question

Question 8.1: Do you agree with our proposal not to regulate the low bandwidth TI services market on the basis that it no longer fulfils the three-criteria test set out in the EC Recommendation? Please provide evidence to support your views.

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<sup>270</sup> In proposing this we note that the provisions within the PPC Direction are included in BT's reference offer, which is a legally binding contract on both parties. This means that If the PPC Direction were removed, BT would still be bound by the contract and would require telecoms providers' agreement to make changes to the contract.

<sup>271</sup> BT letter to Ofcom, 3 July 2018.

## 9. Assessment of markets in the Hull Area

9.1 This section presents our provisional assessment of the wholesale and retail leased lines markets in the Hull Area, including our proposed SMP findings. In 2016 BCMR, we found KCOM to have SMP in the retail and wholesale markets for:

- low bandwidth (up to and including 8 Mbit/s) TI services; and
- CI leased line services at all bandwidths.

9.2 We imposed a range of remedies, which are summarised in Table 9.1 below.

**Table 9.1: Summary of current regulation on KCOM**

Markets	Remedies
Wholesale TI (<=8Mbit/s) <i>and</i> Wholesale CI leased lines (all bandwidths)	<ul style="list-style-type: none"> <li>– Requirement to provide network access on reasonable request and on fair and reasonable prices, terms and conditions</li> <li>– Requirement not to discriminate unduly</li> <li>– Requirement to publish a reference offer, including charges, terms and conditions</li> <li>– Requirement to notify changes to charges, terms and conditions</li> <li>– Requirement to notify changes to technical information</li> <li>– Requirements for accounting separation</li> <li>– Requirement to produce a pricing transparency report</li> </ul>
Retail TI leased lines (<=8Mbit/s) <i>and</i> Retail CI leased lines (all bandwidths)	<ul style="list-style-type: none"> <li>– Requirement to supply retail leased lines on reasonable request and on fair and reasonable charges terms and conditions</li> <li>– Requirement not to discriminate unduly</li> <li>– Requirement to publish a reference offer, including charges, terms and conditions</li> <li>– Cost accounting obligations</li> <li>– Requirement to produce a pricing transparency report</li> </ul>

9.3 In this section we first consider the markets for CI services in the Hull Area, before turning to low bandwidth TI services.

### Markets for CI services at all bandwidths

9.4 We propose to identify the following markets in the Hull Area for CI connectivity at all bandwidths:

- a wholesale market for CI Access services at all bandwidths; and
- a retail market for CI Services at all bandwidths.

9.5 We consider that competitive conditions in the Hull Area continue to be distinct from those in the rest of the UK in that KCOM (and not BT) is the only telecoms provider with

extensive coverage and a large installed base of customers for fixed telecommunications services. KCOM accounts for the majority of wholesale supply of leased lines in the Hull Area, with an estimated [X]% (60-70%) of CI Access services at all bandwidths.<sup>272</sup>

9.6 Our analysis indicates that the availability of regulated wholesale products and alternative network infrastructure in the Hull Area has been sufficient to allow effective competition in the supply of retail leased lines. KCOM is now estimated to account for no more than c. [X]% (less than 40%) of leased lines in the retail market for CI Services at all bandwidths.<sup>273</sup>

9.7 In light of these market shares and other evidence concerning KCOM's position in the supply of both retail and wholesale CI services in the Hull Area, our proposed findings are that:

- KCOM has SMP in the supply of CI Access services at all bandwidths at the wholesale level; and
- regulation of the retail market for CI Services at all bandwidths in the Hull Area is no longer justified.

9.8 We present our assessment in the following order:

- wholesale market for CI Access services: we set out our proposals for the relevant product and geographic markets at the wholesale level and our proposed finding that KCOM has SMP;
- retail market: we review our market definition at the retail level; and
- susceptibility of retail market to *ex ante* regulation: we apply the three-criteria test to the retail market because the 2014 EC Recommendation does not list retail leased line markets as being susceptible to *ex ante* regulation.

## Markets for low bandwidth (TI) services

9.9 We are proposing to continue to identify the following wholesale and retail markets in the Hull Area for this review period:

- wholesale market for low bandwidth (up to and including 8Mbit/s) TI services; and
- retail market for low bandwidth TI services.

9.10 As in the rest of the UK, there are clear dynamics in the rapidly declining TI market that suggest that effective competition will be reached in the foreseeable future. Therefore, we propose, on the basis of the three-criteria test, that *ex ante* regulation of TI services in the Hull Area is no longer justified, and we propose to remove remaining *ex ante* regulation of TI services in the Hull Area.

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<sup>272</sup> Ofcom's analysis of the 1st and 5th BCMR s.135 notices.

<sup>273</sup> Ofcom's analysis of the 1st and 5th BCMR s.135 notices.

## Our approach to presenting our product market definition for the Hull Area

- 9.11 When undertaking our analysis of the Hull Area in the 2013 BCMR, we started by defining retail markets in the absence of wholesale regulation, then repeated the same analysis for the upstream wholesale markets. In the 2016 BCMR, we explained that we were starting with wholesale market definition because this allowed us to present the analysis only once, instead of repeating it.<sup>274</sup>
- 9.12 We have followed this simplified presentation of our market definition analysis for the Hull Area in this BCMR. We start by defining the wholesale market(s). Then we define retail market(s) taking into consideration the wholesale market regulations. We assume the level of wholesale regulation is the same as that imposed by the 2016 BCMR. This is the same approach we have used in other market reviews and is consistent with the EC SMP Guidelines.

## Assessment of competition in wholesale markets for CI Access services at all bandwidths

### Product market definition

- 9.13 We consider that our key proposals regarding wholesale product market definition, as set out in Section 4, are appropriate for the Hull Area. In particular:
- we define a market for CI Access services at all bandwidths. For the reasons set out in Section 4, we think that there is a single access market on the supply side. We consider that the extent of KCOM's fibre infrastructure over which it operates its CI Access services means that KCOM is likely to have a strong market position for CI Access services at all bandwidths;<sup>275</sup> and
  - we consider that EFM and asymmetric broadband do not sufficiently constrain the prices of CI Access services to include them in the same market.
- 9.14 We considered whether to define a separate market for CI Inter-exchange connectivity in the Hull Area, similar to our approach for the rest of the UK (see Section 7).<sup>276</sup> It is our view that the small size of the Hull Area means that demand for connectivity between KCOM exchanges is likely to be very low. Telecoms providers are unlikely to require a network of backhaul and core connectivity within the Hull Area. For example, a telecoms provider may serve its customers through a single point of presence in the Hull Area and then backhaul the traffic to another network node outside the Hull Area.

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<sup>274</sup> 2016 BCMR, paragraphs 6.30-6.35.

<sup>275</sup> WDM services are not currently available in the Hull Area. We consider, based on the asymmetry in network infrastructure between KCOM and other telecoms providers, that should demand for such services arise KCOM would be in a very strong position to supply such services.

<sup>276</sup> As set out in Section 3, inter-exchange connectivity consists of backhaul and core connections. As a result of data aggregation, backhaul circuits transport more communications services and have greater capacity, i.e. higher bandwidth, than access circuits.

- 9.15 Given the likely limited demand for CI inter-exchange connectivity in the Hull Area, we do not propose to define a separate market and undertake a separate SMP assessment for those services. We will consider any evidence from telecoms providers as to the level of demand for such circuits in the Hull Area to inform our final decision on this issue.
- 9.16 Accordingly, we propose to identify for the Hull Area a wholesale market for CI Access services at all bandwidths.

### Geographic market definition

- 9.17 As in previous market reviews, we define the Hull Area as a distinct geographic market. KCOM (and not BT) is the telecoms provider with the most extensive coverage and greatest installed customer base in the Hull Area, indicating a clear difference in competitive conditions from the rest of the UK.
- 9.18 We propose to retain the boundaries of the Hull Area as delineated in our other market reviews.<sup>277</sup>

### SMP assessment in wholesale market

- 9.19 We propose to find that KCOM has SMP in the market for CI Access services at all bandwidths in the Hull Area, and we do not expect KCOM's position in this market to change over the course of the review period.

### Market share and market share trends

**Table 9.2: Market shares for wholesale CI services at all bandwidths in the Hull Area**

Telecom provider	Market share
KCOM	[X]%
CityFibre	[X]%
Vodafone	[X]%
Openreach	[X]%
Virgin Media	[X]%
MS3	[X]%
Level 3	[X]%
Verizon	[X]%
<b>Total Volumes</b>	[X]

Source: Ofcom circuit data analysis based on responses to 1<sup>st</sup> and 5<sup>th</sup> BCMR s.135 notice. Annex 12 provides a more detailed description and explanation of the analysis undertaken.

<sup>277</sup> These boundaries follow the definition of the Licensed Area in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and KCOM Group plc.

- 9.20 Table 9.2 presents distribution of telecoms provider shares based on CI access circuits as of December 2017. Annex 12 explains the approach followed in estimating market shares based on customer ends.<sup>278</sup>
- 9.21 Based on our analysis of provider data obtained in response to s.135 notices, KCOM maintains a very high share of [REDACTED]% (60-70%) in the market for CI Access services at all bandwidths. KCOM's very high share gives rise to a strong presumption that KCOM has SMP, corroborating the evidence regarding the limited presence of rival infrastructure described below.
- 9.22 In the 2016 BCMR, we found KCOM to have a share of over 95% in the wholesale market for CI services at all bandwidths. Our latest analysis of market shares suggests that CityFibre and other telecoms providers have substantially increased their share of the sale of wholesale services in the Hull Area and now account for c.[REDACTED]% (30-40%) of the market. However, in our view, the incursions by other telecoms providers are not yet on a scale sufficient to suggest that KCOM now faces, or will face over the review period, effective competition. We note that, save in exceptional circumstances, a market share in excess of 50% is evidence of the existence of a dominant position.<sup>279</sup>

#### **Control of infrastructure not easily duplicated**

- 9.23 We explain in Section 4 why network infrastructure, in our view, is the main determinant of competition for supply of wholesale leased lines, as telecoms providers require network in the proximity of a site to compete for supply of CI services to that site. We also note that the presence of rival infrastructure is an indicator of differences in competitive conditions, with potential for competition confined to areas with greater presence of rival infrastructure.
- 9.24 KCOM's duct network is ubiquitous in the Hull Area. It is because of its extensive network infrastructure that KCOM can supply wholesale CI Access services to almost any site in the Hull Area relatively quickly and without incurring substantial costs in extending its network.
- 9.25 We do not consider that other telecoms providers have the ability or incentive to duplicate the scale of KCOM's network infrastructure in the Hull Area. The costs of developing such an extensive network infrastructure would be very significant. With KCOM already having developed its extensive infrastructure and having largely sunk the costs of doing so, other telecoms providers would unlikely be able to recover their investment costs. The small number of potential customers in this market makes it unviable in contrast to the rest of the UK.
- 9.26 Evidence based on our network reach analysis shows that the presence and depth of rival infrastructure is limited in the Hull Area. Table 9.3 presents six competitive indicators

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<sup>278</sup> Customer ends refer to leased lines circuit ends terminating at customer premises.

<sup>279</sup> EC SMP Guidelines, paragraph 55.

indicating the presence and depth of rival networks in the Hull Area. For a detailed explanation of each indicator see Section 6.

**Table 9.3: Competitive indicators for the Hull Area**

Description	Category	Value
Average number of rival networks within*	50 metres	0.24
	100 metres	0.57
Proportion of businesses in areas where X+ other telecoms providers are located within buffer distance of 50metres (100metres)	1+ other telecoms providers	20% (38%)
	2+ other telecoms providers	3% (17%)
	3+ other telecoms providers	0% (1.5%)
Average radial (route) distance to nearest rivals (metres)	First	249 (349)
	Second	815 (1,141)
	Third	1,877 (2,627)
Number of postcode sectors (out of 59) where on average there is at least one other telecoms provider within the given distance of a business **	25m	0
	50m	0
	100m	5
Number of customer ends and proportion (X%) by means indicated <sup>144</sup>	<u>KCOM</u>	[Redacted]
	On-net duct connected	[Redacted]%
	<u>Rivals</u>	15
	On-net duct connected	(19%)
	On-net dig	(25%)
	Off-net	(56%)
	Rivals build v buy <sup>145</sup>	31%
Median radial distance dug in 2017 (metres)	<u>KCOM</u>	[Redacted]
	<u>Rivals</u>	59.6

Source: Ofcom's network reach analysis and circuit data analysis based on 1st and 5th BCMR s.135 notice.

\* Average network reach concerns the average number of other telecoms providers with a flexibility point within the buffer distance (50m and 100m) of businesses. Determined at postcode sector level.

\*\* We determine the network reach value of a postcode sector as the average number of other telecoms providers with a flexibility point within the given distance of business sites located in that sector. Network reach values provide an estimate of presence of rival infrastructure. Annex 12 provides a more detailed description and explanation of the network reach analysis undertaken.

- 9.27 The competitive indicators in Table 9.3 show, in our view, that KCOM enjoys substantial advantages as a result of its infrastructure, because:
- the average number of points of presence of other networks within 50m and 100m of businesses within the Hull Area, i.e. 0.24 and 0.57 respectively, is too low for effective competition;
  - less than 5% of businesses in the Hull Area have two or more other telecoms providers within 50m, rising to only 17% within 100m, which is too low for effective competition;
  - the average distances from a business to the nearest points of presence of other networks are too large for effective competition;
  - there are no postcode sectors with the potential to be competitive (i.e. at least two rivals within 50m) and no sectors where businesses on average even have at least one rival telecoms provider within 50m;
  - KCOM have connected [REDACTED]% of customer ends using its own existing duct whereas rivals were only able to provide 19% of customer ends using their own duct, digging new duct for 25% of orders and purchasing wholesale connections from other telecoms providers for the remaining 55% of orders; and
  - the median distance dug by KCOM for new duct was substantially lower at [REDACTED] metres compared to its rivals at 59.6 metres.

#### **Barriers to entry and recent network extension insufficient to change KCOM's position for this review**

- 9.28 As explained in Section 6, sunk costs and switching costs can give rise to barriers to entry and expansion in wholesale leased lines markets. The large asymmetry between KCOM and other telecoms providers – in terms of the presence and coverage of their networks and installed customer base – suggests that such barriers are likely to be present in the Hull Area.
- 9.29 Some telecoms providers have started extending their networks into the Hull Area:
- MS3 has extended its network in the Hull Area.<sup>280</sup> Our analysis of rival infrastructure shows that MS3's extension of infrastructure has been limited, and the service share analysis we carried out indicates that MS3 supplies a very limited number of leased lines. Furthermore, we understand MS3's primary focus to be the provision of business broadband (asymmetric) services rather than leased lines.
  - BT now has a fully operational multi-service edge node at its Anson Exchange in the centre of Hull which enables BT to provide Ethernet services to sites in the Hull Area, using a combination of its own infrastructure and regulated wholesale products purchased from KCOM.<sup>281</sup> However, we understand that [REDACTED].<sup>282</sup>

<sup>280</sup> MS3 website, <http://www.ms-3.co.uk/pages/about-us.html> [accessed 30 October 2018].

<sup>281</sup> 2016 BCMR, paragraph 6.51.

<sup>282</sup> Email dialogue between Openreach and Ofcom dated 8 June 2018. [REDACTED].

- CityFibre now has about [REDACTED]% of the wholesale leased line market in the Hull Area shared by [REDACTED] customers of which [REDACTED], [REDACTED] and [REDACTED], account for about [REDACTED]% of CityFibre’s sales in the Hull Area.<sup>283</sup> We also understand that CityFibre’s network, which could be used to provide competitive access services, covers only part of the Hull Area.<sup>284</sup>

9.30 These recent network extensions improve the potential for competition in the markets for wholesale leased lines in the Hull Area and there may be longer-term prospects for competition in the wholesale market. However, we do not consider that the presence of a single scale entrant (CityFibre) in addition to the incumbent operator to be sufficient for effective competition in the market for CI Access services, for the reasons set out in Section 6.

9.31 Therefore, we do not consider that these or other potential investments will be sufficient for competition for CI Access services to become effective over the course of the review period. We consider that KCOM will continue to derive an advantage from its control over its more extensive network in the Hull Area over the review period. In other words, despite the network extensions, KCOM will remain the only telecoms provider with a duct network that extends to most sites in the Hull Area. It will be the only telecoms provider with network infrastructure close enough to customers’ sites to be a realistic supplier in most cases as evidenced by the contents of Table 9.3 and our analysis as set out in Sections 4-6.

### **Economies of scale and scope**

9.32 We also set out in Section 6 why, in our view, economies of scale and scope arise in wholesale leased lines markets. We consider that KCOM derives a material advantage from the scale and scope of its operations in wholesale markets for fixed telecommunications services – including leased lines – in the Hull Area. The scale and scope of KCOM’s operations are a degree greater than those of any other telecoms provider.

9.33 KCOM is not large when compared to BT. The scale and scope of BT’s operations outside the Hull Area may lower the costs it incurs, relative to KCOM’s, in providing leased lines. However, we do not consider that this benefit offsets the advantages KCOM derives from the greater scale and scope of its infrastructure within the Hull Area, where the costs of developing such infrastructure (duct and fibre) are much more significant.

### **External constraints**

9.34 Some users might be prepared to switch to services, such as asymmetric broadband, which are outside wholesale markets for CI Access services, in response to a rise in the relative

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<sup>283</sup> Ofcom analysis of CityFibre response to 1st s.135 notice.

<sup>284</sup> A map of CityFibre’s network in the Hull Area has been published in a number of sources including, for example, the Hull Daily Mail.

price of leased lines.<sup>285</sup> However, as KCOM is the only telecoms provider with an extensive network in the Hull Area, we do not consider that such external constraints materially affect our assessment of KCOM's SMP.<sup>286</sup>

### Countervailing buyer power

9.35 We do not consider that countervailing buyer power is likely to effectively constrain KCOM. As explained in Section 6, effective buyer power requires purchasers to have a credible threat to meet requirements through another source of supply. However, the limited presence of rival infrastructure in the Hull Area, as evidenced in Tables 9.2 and 9.3 above, implies that purchasers of leased lines in the Hull Area will typically have no more than one other alternative telecoms provider with network infrastructure within a reasonable distance of their site. This means that another source of supply will frequently not be available.

### Prospects for competition

9.36 The total demand for and value of CI leased lines services in the Hull Area are small in comparison to those in other parts of the UK, making it an apparently relatively unattractive location for other telecoms providers to make significant investments in infrastructure. However, in light of the recent investments by CityFibre and others noted above, the longer-term prospects for competition in wholesale markets for leased lines in the Hull Area appear somewhat better than in the past.

9.37 While the prospects for competition have improved, our provisional view is that these recent investments or other potential investments will be insufficient for competition for wholesale CI Access services to become effective during the review period.

### Provisional conclusions

9.38 We have set out above our review of the wholesale market for CI Access services in the Hull Area. We show that, in our view:

- KCOM's market share is high;
- KCOM enjoys substantial advantages compared to other telecoms providers in the Hull Area as a result of its infrastructure; and
- while prospects for competition in the market in the Hull Area may be somewhat better than in the past we do not believe competition will become effective during this review period.

9.39 Having considered the facts set out above, we propose to find that KCOM has SMP in the wholesale market for CI Access services in the Hull Area.

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<sup>285</sup> A product forms a distinct market if, in the event of a SSNIP, switching to other products would not be sufficient to make that SSNIP unprofitable. However, even if a SSNIP would be profitable, the possibility that substitution to products outside the market has some, though lesser, constraining influence on prices remains.

<sup>286</sup> KCOM is regulated in various other fixed telecommunications markets. However, and despite this, external constraints by their nature tend to be relatively weak, while constraints from competition within wholesale leased line markets in the Hull Area are also weak.

## Retail CI services in the Hull Area: three-criteria test

### Introduction

- 9.40 In 2016 BCMR we found that, unlike in the rest of the UK, the availability of regulated wholesale products had not been sufficient to allow effective competition in the supply of retail leased lines in the Hull Area.<sup>287</sup> We therefore identified a retail market for CI services in the Hull Area in which KCOM had SMP.
- 9.41 As set out in Annex 5, the 2014 EC Recommendation has listed a number of markets as being susceptible to *ex ante* regulation. Retail leased lines are not listed in the 2014 EC Recommendation as a market in which *ex ante* regulation may be required.
- 9.42 However, the 2014 EC Recommendation recognises that there are situations where it may be appropriate to impose *ex ante* regulatory obligations according to national circumstances.<sup>288</sup> To assess whether it is appropriate to impose such obligations in a market not listed, the 2014 EC Recommendation sets out the following three criteria which must all be met (the three-criteria test) if *ex ante* regulation is to be imposed:
- the presence of high and non-transitory barriers to entry. These may be of a structural, legal or regulatory nature;
  - a market structure which does not tend towards effective competition within the relevant time horizon. The application of this criterion involves examining the state of infrastructure-based competition and barriers to entry; and
  - the application of competition law alone is insufficient to adequately address the identified market failure(s).<sup>289</sup>
- 9.43 Therefore, in the 2016 BCMR it was necessary to show that the retail CI services market satisfied the three-criteria test to impose regulation.
- 9.44 Where we have made a market power determination in relation to a market, we are required to review our finding.<sup>290</sup>
- 9.45 We first consider whether our market definition remains appropriate. We then consider whether the retail market for CI services at all bandwidths in the Hull Area remains susceptible to *ex ante* regulation. We propose to find that it is not, on the basis that it no longer satisfies the three-criteria test.

### Market definition

- 9.46 Our retail market definition assumes the presence of wholesale SMP regulation. That is, we assume KCOM provides access to its leased line products for the wholesale market for CI Access services on regulated terms. The availability of KCOM's wholesale product implies

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<sup>287</sup> 2016 BCMR, paragraph 6.3.

<sup>288</sup> This must be done in accordance with the principles of competition law and taking utmost account of the 2014 EC Recommendation and EC SMP Guidelines.

<sup>289</sup> 2014 EC Recommendation, Recital 19.

<sup>290</sup> Section 84A(3) of the Act.

that other telecoms providers can use these wholesale products to compete for the provision of retail leased lines.

- 9.47 Consistent with our wholesale market definition for CI Access services, we consider there is a single product market at all bandwidths at the retail level on the supply side:
- retail providers are equally able to supply any bandwidth where customers are already fibre connected, and the incentive to do so is similar across all bandwidths at competitive prices;
  - where customers are not fibre connected, retail providers need to request KCOM to extend its network to the customer site or build their own network if they are vertically integrated. We consider that the ability and incentive to do this is sufficiently similar across all bandwidths at competitive prices to aggregate all bandwidths into a single market. This is supported by KCOM’s retail service share being below 40% and being similar across all bandwidths.
- 9.48 As established in Section 4, we consider that supply-side substitution is more relevant than demand-side substitution for market definition purposes in this case. This is because demand-side substitution does not account for the fact that a leased line customer switching from a KCOM leased line to another KCOM leased line of a different bandwidth would be ‘recaptured’ by KCOM.
- 9.49 For the reasons set out above our initial view is that there is a single retail market for CI services at all bandwidths in the Hull Area.

### **Application of the three-criteria test to the retail market for CI Access services at all bandwidths**

- 9.50 Having established the boundaries of the relevant market we now consider whether this market continues to satisfy the three-criteria test, noting that all three criteria need to be satisfied to impose regulation.

#### **We consider there are no longer high structural barriers to entry**

- 9.51 In the presence of wholesale SMP regulation, we consider that the barriers to entry are significantly lower at the retail level than at the wholesale level. This is demonstrated by a number of telecoms providers having taken up KCOM’s wholesale access products to compete for leased line customers. Market share data shows that [Redacted]% 30-40% of retail CI service volumes are supplied by telecoms providers using KCOM’s infrastructure.
- 9.52 In addition, CityFibre’s recent entry into the market, and the fact that it has quickly won a significant share of it (around [Redacted]%), is consistent with a market exhibiting low barriers to entry.

#### **We consider the structure of this market is now tending towards effective competition within the relevant time horizon**

- 9.53 Since our last review in 2016, KCOM’s market share has dropped significantly following the entry of CityFibre. We estimate that KCOM’s market share is now [Redacted]% less than 40%

followed by BT, CityFibre and Virgin Media with retail shares of [X]%, [X]%, and [X]% respectively. We consider that this market structure is consistent with a market in which there is effective competition, where no single telecoms provider has SMP.

### Provisional conclusion

9.54 Based on KCOM's low market share and CityFibre's network expansion into the Hull Area, we consider that the retail market for CI services at all bandwidths in the Hull Area no longer satisfies the three-criteria test and therefore it is no longer susceptible to *ex ante* regulation. Consequently, we propose to withdraw existing retail regulation in the Hull Area.

## Assessment of the low bandwidth traditional interface (TI) markets in the Hull Area

9.55 The remainder of this section sets out our provisional conclusions on the retail and wholesale low bandwidth traditional interface (TI) services markets (those services at bandwidths up to and including 8 Mbit/s) in the Hull Area.

9.56 In Section 8 we set out our proposals in relation to wholesale low bandwidth TI services in the rest of the UK. We provisionally conclude that low bandwidth TI services constitute a separate market for the period of this review, but that there are clear dynamics in this rapidly declining market that suggest effective competition will be reached in the foreseeable future. We explained that we consider that *ex ante* regulation is no longer justified for low bandwidth TI services in the UK excluding the Hull Area and propose to remove all remaining regulation that applies to BT in this market.

9.57 We similarly propose in this section that *ex ante* regulation is no longer justified for wholesale and retail low bandwidth TI services in the Hull Area and propose to remove all regulation that currently applies to KCOM in these markets.

## Background

9.58 Demand for TI services is in decline. As discussed in Section 8 in relation to the UK excluding the Hull Area, almost all new demand for leased lines services is met by more modern alternatives. We have no reason to believe that the same does not apply to the Hull Area. As TI circuits are a legacy service, we do not expect significant new demand, new entry or competition within the TI segment.

9.59 As in the rest of the UK, TI services in the Hull Area are being delivered by a platform based on legacy technology. KCOM has told us that the platform and services it delivers are currently reliable with manageable spares and support issues. KCOM has said its main concern is falling numbers of service connections driving increased unit operating costs.<sup>291</sup>

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<sup>291</sup> KCOM email, dated 27 July 2018, confirming statements made during telephone call on 19 July 2018.

- 9.60 In the 2016 BCMR, we identified separate retail and wholesale markets for low bandwidth TI services in the Hull Area.
- 9.61 We noted that while users were switching from TI to modern alternatives, the process of migration would not be affected by modest changes in relative price. We therefore continued to find a distinct product market for TI services.
- 9.62 We concluded that KCOM had SMP in the wholesale market for low bandwidth TI services in the Hull Area and imposed appropriate remedies. We further concluded that despite the availability of KCOM’s wholesale products on regulated terms, wholesale SMP regulation would not be sufficient to sustain effective competition in retail markets<sup>292</sup>, and imposed appropriate remedies at the retail level.

## Product markets

- 9.63 In Section 8, we explained that we used the SSNIP test to assess demand-side constraints on wholesale low bandwidth TI services. We considered a range of evidence to inform our SSNIP analysis including:
- the demand for low bandwidth TI services;
  - prices for low bandwidth TI services and Ethernet; and
  - qualitative factors.
- 9.64 We consider these same factors to inform our assessment of wholesale and retail product markets in the Hull Area.

## Demand

- 9.65 Volumes of KCOM TI circuits have declined and continue to decline in the Hull Area. The number of KCOM wholesale leased lines has declined at circa 5% per annum while the number of KCOM retail leased lines has declined approximately in the range of 30% to 50% per annum. Tables 9.4 and 9.5 respectively show the number of wholesale and retail lines since 2016.
- 9.66 KCOM has commented that in its experience certain customers do not want to migrate from TI services to alternatives given their historic and specific usage patterns.<sup>293</sup> This reflects some comments made by stakeholders on the TI market elsewhere in the UK, as discussed in Section 8.

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<sup>292</sup> 2016 BCMR, paragraph 6.87.

<sup>293</sup> Ofcom notes of meeting with KCOM on 24 April 2018.

**Table 9.4 Number of KCOM wholesale low bandwidth TI leased lines**

Period	Number of circuits	Reduction
2016	[Redacted]	
2017	[Redacted]	6%
2018	[Redacted]	4%

Source: Ofcom analysis of data extracted from 2016 BCMR and Price Transparency Reports 2018 and 2017 (revised).

**Table 9.5 Number of KCOM retail low bandwidth TI leased lines**

Period	Number of circuits	Reduction
2016	[Redacted]	
2017	[Redacted]	52%
2018	[Redacted]	31%

Source: Ofcom analysis of data extracted from 2016 BCMR and Price Transparency Reports 2018 and 2017 (revised).

9.67 KCOM also suggests that demand for low bandwidth TI circuits is influenced by changes in demand outside the Hull Area. Our analysis shows that [Redacted]%, c. 60 to 80%, of KCOM's wholesale TI leased lines are for circuits where one end terminates outside the Hull Area.<sup>294</sup> Consequently, we expect that a [Redacted] of the circuits delivered from the KCOM TI platform (by KCOM and other providers) will disappear as migration to Ethernet in the rest of the UK continues.<sup>295</sup>

## Pricing

9.68 In Section 8, we showed that, in the UK excluding the Hull Area, the gap between prices of low bandwidth TI services and those of equivalent Ethernet-based circuits has narrowed as the latter have fallen rapidly.

9.69 KCOM says that migration to alternative services and consolidation of services on higher bandwidth connections is leading to [Redacted]. This reflects comments made by BT as set out in Section 8.<sup>296</sup>

9.70 Information available to us through the KCOM Price Transparency Reports for 2017 and 2018 suggests that while the average price of retail and wholesale TI services and CI Access services in the Hull Area are [Redacted], the gap between CI and TI prices appears to be [Redacted]. The

<sup>294</sup> Ofcom analysis of price transparency reports provided by KCOM in response to SMP conditions imposed in the 2016 BCMR.

<sup>295</sup> Only [Redacted]% of retail leased lines sold by KCOM have one end terminating outside the Hull Area. However, numbers are now very low. Source: Ofcom analysis of data extracted from KCOM Price Transparency Report 2018.

<sup>296</sup> KCOM email, dated 27 July 2018, confirming statements made during telephone call on 19 July 2018.

reasons for this are unclear, but it could be due to the characteristics of the remaining TI circuits, e.g. [REDACTED].<sup>297</sup>

- 9.71 However, given KCOM's statements about [REDACTED] and the observable fall in numbers of TI service users, we believe that TI prices must eventually rise relative to the prices of alternative services.
- 9.72 As in the rest of the UK, we expect this may prompt additional switching in the Hull Area once the cost of alternatives and the cost of change is commercially favourable compared to an increasingly more expensive and possibly less reliable TI service.

### Qualitative factors

- 9.73 In the 2016 BCMR, we noted that while most TI users are expected to eventually switch to Ethernet, some users may be reluctant in the short term to switch due to, among other factors, them placing a high weight on particular characteristics of TI services. For example, we highlighted that Ethernet services could not exactly match all the characteristics of SDH/PDH services such as latency and jitter to the very high specification across all network load scenarios.
- 9.74 In Section 8, we noted that, in the UK excluding the Hull Area, many users of low bandwidth TI remain satisfied with the level of service they receive and are not inclined to switch, and that the timing of any switch will typically occur at their own pace, with it often being delayed up to the point where end-user equipment or applications come to the end of their life. KCOM has told us that its experience of customers is the same. We have also not identified any factors that would make consumers in the Hull Area different.
- 9.75 We also noted that some consumers may consider TI services to be more reliable than Ethernet-based substitutes. However, we noted that this should be considered in context, and that users of these services will increasingly be exposed to higher levels of risk and poor reliability as the legacy TI platform ages.
- 9.76 KCOM told us that the platform and services it delivers are currently reliable with manageable spares and support issues. KCOM has said its main concern is falling numbers of users driving increased operating costs. KCOM also highlighted its dependence on a substantial number of circuits they provide and support where one end terminates outside the Hull Area. KCOM told us that while it has [REDACTED].<sup>298</sup>

### Provisional conclusion on product markets

- 9.77 As in the rest of the UK, we consider that the evidence suggests that currently in the Hull Area:
- although the number of low bandwidth TI services users is declining, the remaining low bandwidth TI users are likely to be those who are most satisfied with the level of service they receive and thus least inclined to switch, even in the event of a SSNIP;

<sup>297</sup> Ofcom analysis of price transparency reports provided by KCOM in response to SMP conditions imposed in 2016 BCMR.

<sup>298</sup> KCOM email, dated 27 July 2018, confirming statements made during telephone call on 19 July 2018.

- in the absence of any strong external factor encouraging migration, many of these users will continue to switch at their own pace, with that typically being where end-user equipment or applications come to the end of their life; and
- modern alternatives represent a viable technical alternative for the majority of TI users that may not yet be commercially attractive, especially when the cost of change, including users end equipment, is included.

9.78 We therefore consider that the evidence suggests that a separate product market for low bandwidth TI services is likely to be present for the period of this review.

### Geographic market

9.79 We propose that there are distinct wholesale and retail markets for TI services in the Hull Area for the same reasons that we identify a geographic market in the Hull Area for CI services, namely KCOM (and not BT) is the telecoms provider with the most extensive coverage and greatest installed customer base in the Hull Area, indicating a clear difference in competitive conditions from the rest of the UK.

### Provisional conclusion on market definition

9.80 Our provisional view is that, as in the rest of the UK, there will remain a distinct market in the Hull Area for low bandwidth TI services for the period of this review. Beyond the period of this review, however, there are clear dynamics between markets that suggest that effective competition arising from other markets will be reached in the foreseeable future.

9.81 Having set out our proposed findings in relation to the relevant market we have then considered whether this declining market remains susceptible to *ex ante* regulation during the relevant period. We do this via the three-criteria test.

### Three-criteria test

9.82 The market for wholesale high-quality access provided at a fixed location (what we refer to as wholesale leased lines, including TI leased lines) is listed in the 2014 EC Recommendation as a market in which *ex ante* regulation may be warranted.<sup>299</sup> However, the 2014 EC Recommendation also recognises that there may be situations where it may be appropriate not to impose *ex ante* regulatory obligations according to national circumstances.<sup>300</sup> To assess whether it is appropriate to impose *ex ante* regulation in a market listed, we use the three-criteria test.

9.83 Retail leased lines are not listed in the 2014 EC Recommendation as a market in which *ex ante* regulation may be warranted. As we currently regulate the market for retail low bandwidth TI leased lines in the Hull Area, we use the three-criteria test to assess whether continued regulation of this market is appropriate.

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<sup>299</sup> 2016 BCMR, Volume 1, paragraph 5.26.

<sup>300</sup> 2016 BCMR, Volume 1, paragraph 5.26.

- 9.84 For simplicity of presentation, our analysis considers the wholesale and retail levels together.
- 9.85 The principles which are relevant to the application of the three-criteria test to TI services are set out in Section 8, and we do not repeat them here.

### Analysis

- 9.86 Our reasoning as to why we have reached the provisional conclusion that the markets for TI services in the Hull Area do not satisfy the three-criteria test are similar to those set out in Section 8 with respect to the other geographic markets covered by this review.
- 9.87 As in the rest of the UK, our analysis suggests that low bandwidth TI services in the Hull Area is becoming an unsustainable legacy technology with declining numbers of customers, no material new demand and no comparable reduction in operating costs. Moreover, modern alternatives exist in the form of CI services that are satisfying the demand for the functionality provided by these services and are where the focus of competition now lies.
- 9.88 KCOM has not announced formal plans to close the TI platform. However, KCOM has told us it [Redacted].<sup>301</sup>
- 9.89 Within this context we do not consider it appropriate that regulation should stifle the timely and managed migration away from low bandwidth TI services to more modern platforms.
- 9.90 While we do not consider the evidence suggests that the low bandwidth TI services are in the same market as CI Access services in the Hull Area over the period of the review, we believe the migration from low bandwidth TI services to other markets will accelerate as the announced closure of the BT platform gathers pace and affects those KCOM circuits that interconnect locations in the Hull Area with locations in the rest of the UK.
- 9.91 Our analysis in relation to the UK excluding the Hull Area suggests that the market for low bandwidth TI services is an increasingly unsustainable legacy technology with few customers and declining demand, and we have no reason to consider that the same does not apply to the Hull Area in the foreseeable future.
- 9.92 We expect that the technological and price convergence, driven by the increasing costs of low bandwidth TI, outlined above, will continue within the period of the review and in the foreseeable future. This means that the market for CI services will increasingly constrain the market for low bandwidth TI services. We therefore believe that there are dynamics which indicate that the market will tend towards effective competition in the absence of *ex ante* regulation. KCOM's ability to exploit its market power in these rapidly diminishing legacy markets will therefore diminish.
- 9.93 As we think there is a market structure which does not tend towards effective competition within the period of the review, but there are dynamics in the market within the review period which indicates that the status of effective competition will be reached in the

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<sup>301</sup> KCOM email, dated 27 July 2018, confirming statements made during telephone call on 19 July 2018.

foreseeable future, the second criterion of the three-criteria test as set out in the 2014 EC Recommendation is not satisfied.

### Provisional conclusion

- 9.94 Considering the analysis set out above, and applying our regulatory judgement, we propose that the cumulative three-criteria test as set out in the 2014 EC Recommendation is no longer satisfied in relation to the low bandwidth TI wholesale and retail markets.
- 9.95 Having reached this provisional conclusion, we consider that it would not be appropriate to impose *ex ante* regulation on any person in relation to the low bandwidth TI services market in the Hull Area. We are therefore proposing to revoke all conditions imposed on KCOM in these markets.

### Consultation questions

Question 9.1: Do you agree with our proposal to deregulate the retail market for CI services at all bandwidths in the Hull Area? Please provide evidence to support your views.

Question 9.2: Do you agree with our analysis and proposed findings in relation to the wholesale market for CI Access services at all bandwidths in the Hull Area? Please provide evidence to support your views.

Question 9.3: Do you agree with our proposal to deregulate wholesale and retail low bandwidth TI services in the Hull Area? Please provide evidence to support your views.

## 10. Approach to remedies

- 10.1 In Sections 4-7, we set out our proposed approach to market definition and proposed finding that BT has SMP in the following markets:
- CI Access services at all bandwidths in all parts of the UK<sup>302</sup> excluding the Central London Area and Hull Area, which we discuss in Section 6; and
  - CI Inter-exchange connectivity at all bandwidths at non-competitive BT exchanges, which we discuss in Section 7.
- 10.2 In this section, we explain the competition concerns that we have identified as a result of our provisional competition assessment. We then set out the approach we have taken in proposing remedies to address our competition concerns and which takes into account our strategy to promote investment and competition as set out most recently in our July 2018 Strategic Policy Position.
- 10.3 In particular, we have taken into account the potential future impact of our proposals for an unrestricted DPA remedy, as set out in our Physical Infrastructure Market Review published in parallel with this consultation.
- 10.4 Finally, we discuss the insufficiency of competition law to address our competition concerns and the implications for this review of BT's reforms of Openreach.
- 10.5 Our proposed remedies for BT are set out in detail in Sections 11 to 15. Our approach and proposed remedies for KCOM in the Hull Area are set out in Section 16.<sup>303</sup>

### Summary of approach

- 10.6 In this review of business connectivity markets, we continue our work to enable investment in networks in line with our strategy by promoting competition. We do this by implementing the following principles:
- promoting network-based competition, targeting our regulation upstream to passive network infrastructure;
  - removing regulation where competitive conditions allow; and
  - protecting consumers by regulating where necessary.
- 10.7 Over time, we expect that competing full-fibre networks, capable of supporting both business and residential services, will provide an effective alternative to BT's dominance in wholesale markets for large parts of the UK. Our approach to remedies is intended to support the development of these networks, while providing protection to customers where that investment is unlikely.

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<sup>302</sup> In Section 5, we provisionally defined a number of geographic markets for CI Access services. In Section 6, we provisionally found BT to have SMP in the Metro Areas; all other HNR areas; BT+1 areas; and BT Only areas.

<sup>303</sup> Ofcom's proposed regulatory financial reporting obligations for both BT and KCOM will follow as part of our forthcoming consultation on regulatory financial reporting.

- 10.8 Our analysis shows that competitive conditions vary across the UK. Under our unrestricted DPA proposals this is likely to evolve further. Our approach to remedies is designed to take this into account. While our strategic focus is on upstream passive remedies, we are also proposing to retain some active remedies to ensure consumers and downstream competition are protected during this transitional period.
- 10.9 In areas where BT faces competition from two or more rivals, we think there is a good chance that effective competition will emerge over time, enabled by unrestricted duct and pole access, and we anticipate being able to deregulate these areas in the future. Our geographic analysis for CI Access services shows that, in addition to CLA, there are some areas where BT already faces some competition from two or more rivals. These are the six Metro Areas and other HNR areas (including areas of other major cities).
- 10.10 However, even in these more competitive areas, greater competition is unlikely to fully emerge over the course of this two-year review, and our objective is to create the right conditions for network builders to invest with confidence. We therefore propose lighter regulation in these areas which is designed to support investment while addressing BT's market power.
- 10.11 In areas where BT does not currently face competition, or where it faces competition from just one rival, we expect unrestricted DPA may in future enable greater competition, in particular for access circuits, where investment in residential broadband may give rise to economies of scale and scope. However, this is likely to be over a longer period of time, and not necessarily in every location. In these areas we are therefore proposing similar regulation to that already in place to protect customers from the effects of BT's dominance.
- 10.12 Finally, we have identified areas where we think competition is least likely to develop, even in the longer term with the enabler of DPA. We consider this to be the case in the CI Inter-exchange connectivity market at BT Only exchanges, where we propose to require BT to provide dark fibre to promote choice and downstream competition.

## Competition concerns in business connectivity markets

- 10.13 In light of our provisional assessment that BT has SMP in the business connectivity markets identified above, we are concerned that, in the absence of appropriate *ex ante* regulation:
- BT would have the incentive and ability to refuse to provide access to its network or not provide access on terms that would secure efficient investment and innovation, both in the relevant wholesale markets and the related downstream retail markets;
  - BT would have the incentive and ability to favour its downstream retail businesses to the detriment of its competitors in the relevant retail markets, by both price and non-price discrimination;
  - BT would have the incentive and ability to fix and maintain some or all of its prices at an excessively high level or engage in a price squeeze;
  - BT would have the incentive to increase prices in areas with limited or no competition to subsidise price reductions in more competitive areas (or where it considers rivals may build); and

- BT may not have sufficient incentives to continuously deliver an adequate level of service quality in the provision and repair of wholesale services and this will impact detrimentally on all downstream providers of leased lines, including BT's retail businesses, which would be to the detriment of consumers.

10.14 In the sections that follow, we set out in more detail why we consider that each of our proposed remedies will help to address the competition concerns we have identified. As set out in Article 8(4) of the Access Directive, our package of *ex ante* remedies must be based on the nature of the competition problems identified and must be proportionate and justified in light of the objectives laid down in Article 8 of the Framework Directive.

## Remedies design

### Dark fibre

10.15 We said in our July 2018 Strategic Policy Position that in this BCMR we would consider proposals for dark fibre that are consistent with our broader objective of promoting investment and competition. In this review, we propose to require BT to provide access to dark fibre in areas where we are confident that network competition is unlikely to develop as a result of DPA in the medium to long term. We consider that such areas are limited to inter-exchange connectivity from BT exchanges where BT is the only operator present and propose a requirement for BT to offer access to dark fibre along such routes.

#### Dark fibre for inter-exchange connectivity

10.16 As discussed in Section 7, BT exchanges act as network nodes, which are used to aggregate traffic and can act as interconnection points between networks. Operators need access to BT exchanges to be able to use some of BT's wholesale access services. Fixed broadband operators are particularly reliant on BT's exchange infrastructure. They offer access services based on LLU and VULA, served from BT exchanges, where they have equipment co-located to aggregate broadband traffic. They rely on leased lines to backhaul this aggregated broadband traffic to their core network from BT's exchanges. To use these access remedies, providers need cost-effective backhaul. If not, backhaul becomes a bottleneck.

10.17 A dark fibre remedy on uncompetitive inter-exchange connectivity routes could significantly reduce backhaul costs (through lower backhaul prices and reduced duplication of equipment). It could therefore promote competition not only in the provision of backhaul between exchanges where there are no or insufficient competitive networks, but also, as backhaul costs are a consideration when building new access networks, could act as an enabler for infrastructure build in marginal access areas.

10.18 We consider that the provision of a dark fibre remedy in inter-exchange connectivity would, alongside other remedies, help to reduce or remove barriers to network expansion and promote access competition in areas where BT has SMP.

- 10.19 We have considered the scope of a dark fibre access remedy for inter-exchange connectivity, and what would best promote competition in light of our focus on network-based competition, and our proposals for unrestricted duct and pole access. While a dark fibre remedy imposed in all non-competitive areas would have the potential to reduce costs for telecoms providers in the short term, there is a risk that, in areas where there is currently some backhaul competition or where there is likely to be backhaul competition in the future, it would negatively affect current and future network investments and so undermine our objective to stimulate competition higher up the value chain.
- 10.20 At BT+1 exchanges, by definition, there is some existing wholesale backhaul competition. In addition, these exchanges tend to be closer to urban areas and our network reach analysis shows the median distance from a BT+1 exchange to a second non-BT network provider is approximately 300m (compared to 6.2km from BT Only exchanges). We consider that unrestricted DPA could allow for additional infrastructure investment to these exchanges and a dark fibre remedy could deter infrastructure providers from building to marginal exchanges.
- 10.21 We are therefore proposing that the dark fibre remedy will apply only to inter-exchange routes from BT Only exchanges. This is likely to cover more than half of Openreach’s total active circuit sales for inter-exchange connectivity. We consider it unlikely that other telecoms providers will build to these exchanges to a material extent, even with a future unrestricted duct and pole access remedy in place. The nearest non-BT network provider is on average 6.2km away, so build-out is likely to be costly and complex, acting as a bottleneck to infrastructure development. We do not therefore anticipate that our proposed remedy would adversely impact future investment decisions.

### Approach to pricing

- 10.22 As set out above, we are concerned that BT would have the ability and incentive to fix and maintain its prices at an excessively high level. This includes its prices for any dark fibre access product. This would be likely to result in little or no take-up of the new dark fibre remedy. We are therefore proposing a charge control for dark fibre in this review.
- 10.23 Typically, we set charge controls based on BT’s costs, unless there is a strong argument to use an alternative approach, such as stimulating competitive investment. As discussed in more detail in Section 12, as we propose dark fibre only from BT Only exchanges, where the prospect of infrastructure competition is low even with duct and pole access, we do not consider it necessary to set a higher price to facilitate investment.
- 10.24 We have considered whether setting a higher price (e.g. based on an “active-minus” approach) would be appropriate to help preserve a bandwidth gradient, i.e. the ability to price higher for higher bandwidths and recover a greater proportion of common costs from these products compared to lower bandwidths. In theory a bandwidth gradient can benefit customers if it allows more customers to purchase leased line products. However, our analysis does not suggest high prices for very high bandwidth (VHB) circuits are necessary for BT to recover its costs, nor that they are leading to a better outcome for customers than a cost-based charge control (see Section 12). Additionally, as the proposed dark fibre

remedy will only be available in areas where there is no existing competition and the likelihood of additional competition is low, we consider that a price premium to incentivise rival investment would be inappropriate.

- 10.25 We therefore propose a cost-based charge control set with reference to the relevant components of BT's underlying passive infrastructure necessary for connections between exchanges.
- 10.26 We have set out our proposed prices for the inter-exchange dark fibre remedy in Volume 2 of this consultation.

### **Dark fibre for CI Access services**

- 10.27 In parallel with this consultation we have published proposals for unrestricted access to BT's physical infrastructure. In designing those proposals, we have undertaken a thorough analysis of the potential impact of unrestricted duct and pole access on network deployment. Our view is that unrestricted infrastructure access significantly increases the likelihood that new access networks will be built. In order to avoid an overlap with areas where competing access networks will emerge we are not proposing to extend our proposed dark fibre remedy to CI Access services.

### **Downstream remedies: regulation of active services**

- 10.28 As discussed above, to protect consumers and downstream competition in the transition to our new regulatory approach and while network build gets underway, we consider regulation of active services remains appropriate.
- 10.29 Our proposals vary by geographic market depending on the degree of competition. We distinguish between:
- those parts of the CI Access services market where there is some competition but where we nevertheless consider BT has SMP, namely the Metro Areas and other HNR areas; and
  - those parts of the CI Access services market where there is limited or no current infrastructure competition (BT Only and BT+1 areas), and
  - the inter-exchange connectivity market, in all exchanges where there is limited or no current infrastructure competition (BT Only and BT+1).
- 10.30 In proposing remedies for those areas of the CI Access services market where we consider there is already some competition (Metro Areas and other HNR areas), we take into account that, under our proposals published today, unrestricted DPA is likely to become available during the review period. Therefore, we are proposing the following lighter remedies in these areas:
- a requirement to provide network access at fair and reasonable charges, rather than a charge control; and
  - a requirement to report on actual performance for quality of service KPIs, but we do not propose to set quality of service standards.

- 10.31 We consider these remedies, in the context of the competition that already exists or which we expect to develop over the period of the review, will be sufficient to address our competition concerns.
- 10.32 Where there is currently limited or no competition (BT Only and BT+1 areas and non-competitive BT exchanges), we are proposing to put charge controls in place (as currently applies to circuits 1 Gbit/s and below in areas where BT is currently designated as having SMP). We are also proposing to retain quality of service standards as well as reporting of actual performance against those standards. We are proposing these remedies will apply in both access and inter-exchange connectivity for all bandwidths.

### Approach to pricing for active remedies

- 10.33 Our proposed charge controls on active services will take the form of a cap at current prices, with the detailed controls set out in Volume 2 of this consultation. Our proposals reflect the specific concerns we have relating to services at different bandwidths.
- 10.34 We expect our dark fibre and infrastructure access remedies to be in use by the end of this review period. In 2021, for the first time, we will undertake a holistic review of business and residential markets. We cannot at this stage be certain what effect these significant changes will have on prices. We also anticipate that by the end of the current charge control period (March 2019) prices will be reasonably close to cost for services already subject to price regulation (1 Gbit/s and below). Therefore, for services at 1 Gbit/s and below, we are prioritising price stability and regulatory certainty over the static benefits of keeping prices tightly aligned to costs.
- 10.35 We propose that a price cap at current prices is better suited to achieve our regulatory objectives than a cost-based charge control. The details of how we set the cap and associated basket design are set out in Volume 2.
- 10.36 We note that BT currently earns high margins on VHB services (higher than it earns for services at lower bandwidths). Our proposal for unrestricted DPA is likely to reduce VHB margins by enabling competitors to undercut BT's active prices using passive components. Our main concern in relation to the pricing of VHB services is that BT would increase prices in areas with limited or no competition to subsidise price reductions in more competitive areas (or where it considers rivals may build). We therefore consider that it is appropriate to put a safeguard cap in place at current prices to protect consumers in areas with limited or no competition.

### Quality of service

- 10.37 To address the competition concerns we have identified, we have set in place tough quality of service standards on Openreach, including in business connectivity where provisioning of Ethernet was previously unacceptable.
- 10.38 As part of this review, we propose a package of QoS remedies, including QoS standards on provisioning and repair, similar to the framework developed in the 2016 BCMR and re-imposed in the Temporary Conditions. Openreach's provisioning performance has

improved significantly since 2016, and we consider that maintenance of this better service, alongside further improvement on the certainty of delivery dates, will meet business customer needs and expectations.

- 10.39 As we set out in Section 15, we propose to enhance transparency on Openreach's performance through a revised suite of KPIs and to update our requirements on Service Level Agreements and Guarantees. We also propose to include dark fibre within the scope of the QoS standards in the second year of the market review period.<sup>304</sup>

## Insufficiency of national and EU competition law

- 10.40 Under Article 8(2) of the Access Directive, where we designate an operator as having SMP in a specific market, we are required to impose remedies. However, in considering the imposition of remedies, we take into account the potential application of competition law. To do this we have considered whether competition law, in particular the rules prohibiting the abuse of a dominant position, would be effective in responding to the competition concerns identified above.
- 10.41 First, we have taken account of the fact that the products in the wholesale markets we have identified are inputs into other downstream markets. Appropriate *ex ante* intervention at the upstream level can promote effective competition in downstream markets. It can also facilitate the emergence of effective competition at the upstream level itself. Competition law, insofar as is relevant, prohibits the abuse of a dominant position – it does not seek to promote competition, which is one of the aims of our package of *ex ante* remedies.
- 10.42 Second, the requirement to address the competition problems in each of the markets in which we find SMP means imposing an interconnected and complex package of remedies, including provisions to ensure that they remain effective for the duration of the review period.
- 10.43 Third, we consider it is important to provide sufficient certainty about the rules applying to the dominant provider in the wholesale leased lines markets. We consider this certainty is best achieved through *ex ante* regulation. *Ex ante* regulation will also allow for timely intervention by us proactively enforcing the conditions and, if necessary, by parties bringing regulatory disputes to us for swift resolution.
- 10.44 We therefore have provisionally concluded that, in the current and expected circumstances of the relevant leased lines markets over the review period, competition law alone would be insufficient to address the competition problems we have identified. We explain in our assessment of our individual remedy proposals where we consider there are particular additional relevant points relating to the sufficiency of competition law.

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<sup>304</sup> We propose to apply QoS standards to dark fibre which only applies to the CI Inter-exchange connectivity market for connections from BT Only exchanges.

## The impact of Openreach reform

- 10.45 On 10 March 2017, BT notified Ofcom of voluntary commitments (the Commitments) to reform Openreach under section 89C of the Communications Act 2003 (Notification).<sup>305</sup> These Commitments mean Openreach will become a distinct company with its own staff, management, purpose and strategy.
- 10.46 In a July 2017 Statement we confirmed our decision to release BT from the undertakings that it offered to Ofcom in 2005 when Openreach was originally created (the 2005 Undertakings), once the new Commitments are fully in place. On 31 October 2018 we released BT from its 2005 Undertakings in accordance with our July 2017 statement.<sup>306</sup> We consider that the new arrangements, established by the Notification, provide Openreach with significantly more independence to take its own decisions about the strategic direction and operation of the network, acting with a clear focus on the equal treatment of all its customers, not just the needs of BT Group.
- 10.47 Having received the Notification from BT, we were required by section 89C(4) of the Communications Act 2003 to consider, as soon as reasonably practicable, the impact on SMP conditions set in relation to markets which, in our opinion, would be affected. We said in our July 2017 Statement that the Commitments are (like the Undertakings before them) designed to operate alongside Ofcom’s regulation of BT’s SMP in individual product markets and that we would therefore consider the effect, if any, of the new arrangements described in BT’s Notification on our SMP regulation as part of our market reviews.
- 10.48 We have considered our competition concerns and proposed remedies in relation to the business connectivity markets, taking into account BT’s Notification and the new arrangements for Openreach.
- 10.49 We have provisionally found that BT has SMP in certain markets for CI Inter-exchange and CI Access services which are important inputs for telecoms providers downstream. BT and Openreach remain in common ownership and BT retains control over the capital expenditure decisions and pricing of its products that exist outside of Openreach. While the Commitments increase the independence of Openreach and require equal treatment of its customers, BT (as a whole) retains the incentive and ability to favour its downstream divisions. We therefore consider that appropriate and proportionate SMP regulation will complement BT’s Commitments, as it did in the case of the 2005 Undertakings that preceded them. The detailed proposals that follow in this document reflect this position.

## Consultation question

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<sup>305</sup> BT 2017, Proposals agreed with Ofcom. <https://www.btplc.com/UKDigitalFuture/Agreed/index.htm> [accessed 30 October 2018].

<sup>306</sup> Ofcom, 2017. *Delivering a more independent Openreach*.

[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0020/104474/delivering-independent-openreach.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0020/104474/delivering-independent-openreach.pdf).

Question 10.1: Do you agree with our proposed approach to remedies? Please provide reasons and evidence in support of your views.

## 11. General remedies

- 11.1 This section outlines our proposed general remedies for the markets in which we have provisionally identified BT as having SMP, which are:
- CI Access services at all bandwidths in the UK excluding the Central London Area and the Hull Area, which we discuss in Section 6;<sup>307</sup> and
  - CI inter-exchange circuits at all bandwidths at non-competitive BT exchanges, which we discuss in Section 7.
- 11.2 By general remedies, we mean the key remedy of requiring BT to provide network access, and other remedies that support and make network access effective. The general remedies that we propose are designed to address the competition concerns that we have provisionally identified in our market analysis associated with a finding of SMP, as discussed in Section 10.

### Summary of proposals

- 11.3 We propose the following general remedies for all services in all markets in which we propose BT has SMP:<sup>308</sup>
- requirement to provide network access on reasonable request;
  - requirements relating to requests for new forms of network access;
  - requirement not to discriminate unduly including equivalence of inputs (EOI);<sup>309</sup>
  - requirement to publish a Reference Offer (RO);
  - requirement to notify changes to charges, terms and conditions;
  - requirement to notify technical information;
  - cost accounting; and
  - accounting separation.
- 11.4 The proposed remedies listed above are substantially the same as those that currently apply, with the following exceptions:
- while we are proposing to reimpose a requirement in relation to requests for new forms of network access, this is less prescriptive than the obligations we imposed in the 2016 BCMR, and is consistent with the equivalent remedy in other markets, for example WLA;

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<sup>307</sup> In Section 5 we provisionally defined a number of geographic markets for CI Access services. In Section 6 we provisionally found BT to have SMP in the following: the Metro Areas; all other HNR areas; BT+1 areas; and BT Only areas.

<sup>308</sup> Network access is defined in section 151(3) of the Act as including interconnection services and/or any services or facilities that would enable another provider to provide electronic communications services or electronic communications networks. Therefore, a requirement to provide network access would include any ancillary services as may be reasonably necessary for a third party to use the services. Consequently, the remedies we have proposed in this section would also apply to the interconnection and accommodation services that BT provides in connection with wholesale services in each of these markets. We propose additional remedies for interconnection and accommodation services in Section 14.

<sup>309</sup> Under an EOI obligation, the inputs available to all providers (including the SMP provider's own downstream divisions) are provided on an equivalent basis.

- our proposed requirement to publish an RO includes some additional obligations relating to SLAs and SLGs for wholesale Ethernet circuits that were previously imposed via direction; and
- we are making minor modifications to the existing requirement to notify charges, terms and conditions; and the existing requirement to notify technical information. These changes are line with similar changes we made in the 2018 WLA Statement.

11.5 For each proposed remedy, we set out below:

- current regulation;
- aim and effect of proposed regulation;
- our proposals; and
- legal tests for adoption of the regulation.

## Requirement to provide network access on reasonable request

### Current regulation

11.6 BT is currently required to provide network access on reasonable request and to provide such access as soon as it is reasonably practicable and on fair and reasonable terms and conditions. Where no charge control or basis of charges obligation applies, BT is required to provide such access at fair and reasonable charges. BT is also required to comply with such terms, conditions and charges as Ofcom may from time to time direct.

### Aim and effect of proposed regulation

11.7 As our market analysis in previous sections shows, the level of investment required by a third party to replicate BT's network and build sufficiently large networks to compete, and the time it would take to do this, are significant barriers to entry. To allow development of diverse and innovative network infrastructure, it is our view that dominant providers must make network access available to third parties on reasonable request. This is fundamental to promoting competition in downstream markets. We consider that, in the absence of such a requirement, BT would have the incentive and ability to refuse access at the wholesale level thereby favouring its own retail operations. This would hinder sustainable competition in the corresponding downstream markets, ultimately against end-users' interests.

### Our proposals

11.8 We are proposing an SMP condition requiring BT to provide network access where a third party reasonably requests it in the markets in which we have provisionally identified BT has having SMP.

11.9 The proposed obligation includes a requirement to provide such network access on fair and reasonable terms and conditions, and at fair and reasonable charges except where a

charge control or basis of charges obligation applies.<sup>310</sup> The proposed fair and reasonable charging element applies differently in different areas of the markets in which we have provisionally identified BT as having SMP, to reflect variations in competitive conditions.

- 11.10 In the CI Access services market, in the Metro Areas and High Network Reach (HNR) areas, we consider some form of price control is needed to address the risk that BT may seek to impose a margin (price) squeeze, or to otherwise act anti-competitively in setting prices. In relation to margin squeeze, there is a recognised risk that a vertically integrated operator may have an incentive to put pressure on competitors by reducing the margin between the wholesale and the retail price to the point where it is not sufficient to cover the relevant measure of retail costs. However, we consider that the relatively greater degree of and scope for competition in these areas means that a charge control would not be appropriate. In these areas, we consider that the proposed fair and reasonable charging obligation is appropriate to address our competition concern.
- 11.11 As in other markets, in assessing this obligation we propose adopting an approach to the evaluation of costs and margins consistent with the margin squeeze test under *ex post* competition law.
- 11.12 In parts of the markets where we are proposing charge controls, there is a residual risk that in the absence of a charge control, i.e. for new services that are introduced after the start of a charge control, or where a charge control expires, BT's market power would give it the ability and incentive to impose a margin squeeze or set excessively high prices.<sup>311</sup> The proposed fair and reasonable charging obligation will therefore act as a backstop where we are proposing charge controls.
- 11.13 We consider that it is appropriate for this SMP condition to include the power for Ofcom to make directions in order that we can secure the supply of services and, where appropriate, fairness and reasonableness in the terms, conditions and charges for providing third parties with network access. The proposed condition requires BT to comply with any such direction(s), so any contravention of a direction would constitute a contravention of the condition itself and would therefore be subject to enforcement action under sections 94-104 of the Act.
- 11.14 As noted above, we propose that our general remedies will also apply to interconnection and accommodation services, including where access to dark fibre is requested. Consequently, BT would be required to meet reasonable requests for interconnection and accommodation services under the general network access obligation that we are imposing for each of these markets.

## Legal tests

- 11.15 For the reasons we have set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.

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<sup>310</sup> We propose that some ECC charges are subject to a basis of charges obligation. See Section 13.

<sup>311</sup> These considerations are applicable to ancillary services and associated charges.

- 11.16 Section 87(3) of the Act authorises Ofcom to set SMP services conditions requiring the dominant provider to provide such network access as Ofcom may from time to time direct. These conditions may, pursuant to Section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to and for securing that the obligations in the conditions are complied with within periods and at times required by or under the conditions. Section 87(9) of the Act also authorises SMP services conditions imposing on the dominant provider such rules as they may make in relation to matters connected with the provision of network access about the recovery of cost and cost orientation, subject to the conditions of Section 88 being satisfied.
- 11.17 In proposing these conditions, we have taken into account the factors set out in section 87(4) of the Act, which are:
- the technical and economic viability (including the viability of other network access products, whether provided by the dominant provider or another person), having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;
  - the feasibility of the provision of the proposed network access;
  - the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made);
  - the need to secure effective competition (including, where it appears to Ofcom to be appropriate, economically efficient infrastructure-based competition) in the long term;
  - any rights to intellectual property that are relevant to the proposal; and
  - the desirability of securing that electronic communications services are provided that are available throughout the Member States.
- 11.18 In proposing that BT should be subject to a requirement to provide network access on reasonable request, we have taken all these six factors into account. In particular, given our view, which we set out in Sections 6, that there are considerable sunk costs associated with building networks to provide leased lines, we consider it is unlikely to be economically viable or efficient to build competing access networks (including by using BT's ducts and poles as discussed in Section 10) on a sufficient scale to provide effective constraint on BT's SMP in downstream markets over the review period. We therefore consider this requirement is necessary for securing effective competition, including economically efficient infrastructure-based competition, in the long term.
- 11.19 The requirement for BT to only meet reasonable network access requests also ensures that due account is taken of the technical and economic viability of installing and using other facilities, the feasibility of the proposed network access, and of the investment made by BT initially in providing the network.

- 11.20 We are also required to ensure that the condition satisfies the tests set out in section 88 of the Act as the requirement places controls on network access pricing, insofar as charges are required to be fair and reasonable.<sup>312</sup>
- 11.21 Section 88(1)(a) of the Act requires that Ofcom must not impose pricing conditions unless it appears from the market analysis carried out for the purpose of setting that condition that there is a relevant risk of adverse effects arising from price distortion. As we have explained above, our competition concerns vary according to variations in competitive conditions. In the CI Access services market, in the Metro Areas and HNR areas, in the absence of price regulation requiring prices to be fair and reasonable, BT would have the ability and incentive to set wholesale and retail prices in a way that could damage downstream competition. In the parts of the market where we are also proposing charge controls, BT would additionally have the ability and incentive to set excessively high prices where no charge control applies.
- 11.22 Section 88(1)(b) of the Act requires that the pricing condition should be appropriate for the purposes of promoting efficiency, promoting sustainable competition and conferring the greatest possible benefits on the customers of public electronic communications services.
- 11.23 Where we propose a fair and reasonable charges obligation, we consider that this will prevent BT from setting charges that impact other providers' ability to compete with BT in downstream markets and so will support the aim of promoting improved efficiency.
- 11.24 We also consider that the provision of network access on fair and reasonable terms will promote sustainable competition by ensuring that other telecoms providers can effectively compete downstream. We consider this to be the appropriate approach for the purposes of conferring the greatest benefits on customers of downstream services.
- 11.25 We are also required, under Section 88(2) of the Act, to consider BT's investment. We believe that fair and reasonable charges will allow BT's costs to be taken into account and will also provide for common cost recovery. This condition is therefore an appropriate basis upon which to control BT's prices.
- 11.26 We consider that this proposal meets our duties under sections 3 and 4 of the Act. We consider that the imposition of a network access obligation promotes competition in relation to the provision of electronic communications networks and services, ensuring the provision of network access and service interoperability for the purposes of securing efficient and sustainable competition and the maximum benefit for end-users. This is because the imposition of the obligation would ensure that BT offers the wholesale products required by other providers to compete effectively in the downstream markets.
- 11.27 With regard to the Community requirements set out in section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, we believe section 4(8) is met, where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by

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<sup>312</sup> We explain in Volume 2, Section 5 why we consider that our proposed charge control conditions satisfy the tests set out in section 88.

helping to ensure that other providers can continue to compete effectively in the downstream retail markets by using wholesale products offered by BT.

- 11.28 Section 47(2) of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:
- objectively justifiable, in that it facilitates and encourages access to BT’s network and therefore promotes competition to the benefit of consumers;
  - not unduly discriminatory, as it is proposed only for BT and no other provider has been found to hold a position of SMP in these markets;
  - proportionate, since it is targeted at addressing the market power that we propose BT holds in these markets and does not require it to provide access if it is not technically feasible or reasonable; and
  - transparent, in that it is clear in its intention to ensure that BT provides access to its networks to facilitate effective competition.
- 11.29 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

### The BEREC Common Position

- 11.30 We have also taken utmost account of the BEREC Common Position in formulating our proposals, including BP5 and BP36 which appear to us to be particularly relevant in this context.<sup>313</sup> We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## Requests for new forms of network access

### Current regulation

- 11.31 In the 2016 BCMR we required BT to publish guidelines specifying the content and form of requests for new types of network access and how they will be handled (with reference to the Statement of Requirements (SoR) process). Since these guidelines were already in place when we imposed the Temporary Conditions, we did not consider that there was an urgent need for a temporary condition specifically relating to new access requests. BT is not therefore currently subject to such a requirement for CI services. However, we said that such a remedy remained appropriate for promoting competition in downstream markets.<sup>314</sup>

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<sup>313</sup> BEREC, 2012, *BEREC common position on best practice in remedies imposed as a consequence of a position of significant market power in the relevant markets for wholesale leased lines* (BoR (12) 126), [http://berec.europa.eu/files/document\\_register\\_store/2012/11/BoR\\_\(12\)\\_126\\_Draft\\_WLL\\_CP\\_2012.11.26.pdf](http://berec.europa.eu/files/document_register_store/2012/11/BoR_(12)_126_Draft_WLL_CP_2012.11.26.pdf).

<sup>314</sup> Temporary Conditions paragraph 3.16.

- 11.32 In March 2017, we consulted on proposed remedies for the WLA market.<sup>315</sup> We sought to strengthen the remedy for new access requests in relation to WLA services by mirroring the more detailed requirements of the 2016 BCMR remedy.<sup>316</sup>
- 11.33 However, in our March 2018 WLA statement, we noted improvements in the time taken by Openreach to respond to and implement SoR requests, industry discussion of SoR issues, and improvements introduced by Openreach around the SoR process.<sup>317</sup> We concluded that it was not appropriate to introduce a more prescriptive process in the WLA market, and decided to maintain the current regulations surrounding the SoR process.

## Aim and effect of proposed regulation

- 11.34 In the absence of regulation, vertically integrated operators have the ability to favour their own downstream business over third party providers by differentiating on price or terms and conditions. One form of discrimination may be in relation to the handling of requests for new forms of network access. This has the potential to distort competition at the retail level by placing third party providers at a disadvantage compared with the downstream retail business of the vertically integrated provider.
- 11.35 We consider that obligations specifying how requests for new types of network access should be handled can mitigate the risk of this type of discrimination.
- 11.36 The aim of this regulation is to support access seekers in ensuring that there is a fair, reasonable and transparent process for assessing reasonable requests for new forms of network access. To make such a request, the telecoms provider should provide the dominant provider with an SoR against which the reasonableness of the request can be assessed.
- 11.37 We consider that in the absence of such a requirement, BT has the incentive and ability to refuse to provide new forms of network access at the wholesale level, thereby favouring its own retail operations with the effect of hindering sustainable competition in the corresponding downstream, and/or limiting innovation, ultimately against the interests of consumers.

## Our proposals

- 11.38 We propose to re-introduce a requirement covering requests for new forms of network access. We consider that this requirement remains an appropriate and proportionate *ex ante* measure to complement the general network access requirement.

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<sup>315</sup> 2018 WLA Consultation, paragraphs 5.40-5.50.

<sup>316</sup> In summary, these were to: set prescriptive timescales for each stage of the SoR process; allow for an extension to the prescribed timescales in certain circumstances; require BT to carry out a feasibility study to determine whether an SoR request is reasonable, if necessary; require BT to be more transparent in setting out its reasons for rejecting an SoR request; and ensure that BT has a suitable SoR classification tool.

<sup>317</sup> 2018 WLA Statement, paragraphs 6.55-6.59.

11.39 We propose to align the proposed requirements with those that currently apply in the WLA market. We are not aware of any developments around the SoR process since publication of our WLA statement that would suggest a more prescriptive approach may be appropriate. As set out in our initial report on the separation of Openreach from BT,<sup>318</sup> we will monitor Openreach activities on an ongoing basis, which will equip us to review any issues that arise with the SoR process.

## Legal tests

11.40 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.

11.41 Section 87(3) authorises the setting of a SMP condition requiring the dominant provider to provide network access as Ofcom may, from time to time, direct. These conditions may, pursuant to section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to, and for securing that the obligations in the conditions are complied with within periods and at the times required by or under the conditions.

11.42 In proposing this condition, we have also taken into account the factors set out in section 87(4) of the Act. In particular, we consider that the SMP condition specifying how BT should handle requests for new network access is required to ensure that BT does not discriminate in favour of its own downstream business. The proposed condition achieves this by:

- requiring BT to publish reasonable guidelines specifying the required content and form of requests for new network access and how they will be handled;
- requiring BT to provide sufficient technical information to enable other providers to draft product specifications that are efficient, and which satisfy the reasonable requirements; and
- specifying a set of principles, including the need for reasonable timescales at each stage of the process and that changes to the guidelines are made only after they are agreed between BT and other providers.

11.43 We have also considered our duties under the Act, including our general duties under section 3 and the community requirements set out in section 4. We note, in particular, that the proposed condition is aimed at promoting competition in downstream markets, by ensuring that access seekers are able to make requests for new forms of network access based on an agreed SoR process.

11.44 We also consider that the proposed condition meets the criteria set out in section 47(2) of the Act. The condition is:

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<sup>318</sup> Ofcom, 2018. *Progress on delivering a more independent Openreach*.

[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0019/114814/openreach-implementation-report-2018.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0019/114814/openreach-implementation-report-2018.pdf).

- objectively justifiable, in that its purpose is to support the provision of access to BT's network and non-discrimination obligations in the processing of requests for new network access;
- not unduly discriminatory, as it applies to BT only, in the markets where we have provisionally found it to have SMP;
- proportionate, as it continues to provide a SoR process based on the current process, while allowing scope for industry to be involved in agreeing improvements; and
- transparent, in that the condition is clear in its intention to set requirements for the processing of requests for new network access.

11.45 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

### **The BEREC Common Position**

11.46 We have also taken utmost account of the BEREC Common Position including BP6 which appears to us to be particularly relevant in this context. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## **No undue discrimination including equivalence of inputs (EOI)**

### **Current regulation**

11.47 BT is currently subject to a requirement not to unduly discriminate and to deliver business connectivity services in the markets in which we have found BT has SMP on an EOI basis.

### **Aim and effect of proposed regulation**

11.48 A non-discrimination obligation is intended as a complementary remedy to the network access obligation, principally to prevent the dominant provider from discriminating in favour of its own downstream operations and to ensure that competing providers are placed in an equivalent position. Without such an obligation, the dominant provider is incentivised to provide the requested wholesale network access service on terms and conditions that discriminate in favour of its own downstream operations. For example, BT may decide to charge its competing providers more than the amount charged to its own downstream units or it might provide the same services but within different delivery timescales. Both these behaviours could have an adverse effect on competition.

11.49 Non-discrimination can have different forms of implementation. A strict form of non-discrimination – i.e. a complete prohibition of discrimination – would result in the SMP operator providing exactly the same products and services to all providers (including its own downstream operations) on the same timescales, terms and conditions (including price and service levels), by means of the same systems and processes and by providing the same information. Essentially, the inputs available to all providers (including the SMP provider's own downstream operations) would be provided on a truly equivalent basis, an arrangement which has become known as equivalence of inputs (EOI). An EOI obligation removes any degree of discretion accorded to the nature of the conduct.

- 11.50 A less strict implementation of non-discrimination may allow for flexibility and result in a more practical and cost-effective implementation of wholesale inputs in cases where it is economically justified.
- 11.51 In this review we have considered what form of non-discrimination obligation would be appropriate in each of the wholesale leased lines markets. Our proposal include EOI only where we consider it necessary to effectively mitigate against the risk of discrimination by BT in favour of its downstream operations.

## Our proposals

- 11.52 Given that we are proposing to impose on BT a requirement to provide network access, it follows that this access is to provided without undue discrimination. Therefore, we propose to impose on BT an EOI requirement, and that the condition is to apply to the wholesale leased lines markets in which we propose BT has SMP.
- 11.53 Services provided in these markets are key inputs that enable competition downstream, and the availability of wholesale inputs on an EOI basis would prevent BT from engaging in discriminatory practices that could adversely affect competition and ultimately cause detriment to citizens and consumers. Conversely, prohibiting undue discrimination while stopping short of EOI could result in BT providing competitors with a different set of products to those it provides to itself. This may include the use of different processes and systems for product development, delivery, maintenance and repair. While this may not be unduly discriminatory (depending on the precise circumstances), it would fall short of true equivalence and could undermine effective competition.
- 11.54 Our proposed requirement does not require BT to offer wholesale WDM circuits on a fully EOI basis. As we discussed in the 2016 BCMR, telecoms providers may wish to provide leased lines using a combination of their own networks and WDM services from Openreach, using non-standard WDM interfaces to facilitate interconnection. BT's downstream operations, however, may be more likely to use WDM services from Openreach to deliver end-to-end services without interconnection, and would therefore use WDM services with standard interfaces. Our proposed condition (like the condition we imposed in 2016) is designed to address BT's ability to discriminate by specifying that in the case of WDM circuits provided to other telecoms providers, that differ from those provided by BT to itself only in relation to the interfaces used, BT is required:
- to provide such services on the basis of EOI in all respects other than price; and
  - not to discriminate unduly between the prices it charges. This means that the difference in price between the variants of the same product should be no greater than the difference between their long-run incremental costs.
- 11.55 We consider these additional requirements are necessary as the EOI obligation alone is likely to have limited effect because BT may have no need to consume WDM services with non-standard interfaces.

### Access to dark fibre for inter-exchange connectivity on EOI basis

11.56 Given the dark fibre access remedy is a new form of regulation, it is important that any telecoms provider looking to access infrastructure to develop inter-exchange connectivity as part of its wider network has access to equivalent products and services on the same timescales as other operators. The proposed EOI requirement will therefore apply to BT when providing access to dark fibre in the inter-exchange connectivity market. However, BT will not be required to consume a dark fibre product in providing active services.

### Legal tests

11.57 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.

11.58 Section 87(6)(a) of the Act authorises the setting of an SMP services condition requiring the dominant provider not to discriminate unduly against particular persons, or against a particular description of persons, in relation to matters connected with the provision of network access.

11.59 Section 87(6) implements into UK law Article 10 of the Access Directive. Article 10(1) provides that a national regulatory authority may: “impose obligations of non-discrimination, in relation to interconnection and/or access”.

11.60 Article 10(2) further provides:

“[o]bligations of non-discrimination shall ensure, in particular, that the operator applies equivalent conditions in equivalent circumstances to other undertakings providing equivalent services, and provides services and information to others under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners”.

11.61 We have considered our duties under section 3, and all the Community requirements set out in section 4, of the Act. In particular, the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefits for consumers by preventing BT from leveraging its SMP into downstream markets.

11.62 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions are:

- objectively justifiable, in that they provide safeguards to ensure that competitors, and hence consumers, are not disadvantaged by BT discriminating unduly in favour of its own downstream activities or between different competing providers;
- not unduly discriminatory, in that they are proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
- proportionate, in that they only seek to prevent undue discrimination; and
- transparent, in that the conditions are clear in what they are intended to achieve.

11.63 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

## The BEREC Common Position

11.64 We have taken utmost account of the BEREC Common Position in formulating our proposals, including BP8, BP10 and BP10a which appear to us to be particularly relevant in this context. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## Transparency

11.65 BT is currently subject to a set of obligations designed to promote transparency, reduce the risk of undue discrimination and ensure that other telecoms providers are able to make effective use of BT's network access. These obligations, which are discussed in more detail below, are:

- a requirement to publish an RO;
- a requirement to notify changes to charges, terms and conditions in advance; and
- a requirement to notify changes to technical information in advance.

## Publication of a Reference Offer

### Current regulation

11.66 BT is currently required to publish an RO in relation to the provision of network access, setting out (at a minimum) such matters as the terms and conditions for provisioning, technical information, SLAs and SLGs, and availability of co-location.

### Aim and effect of proposed regulation

11.67 A requirement to publish an RO has two main purposes:

- to assist transparency for the monitoring of potential anti-competitive behaviour; and
- to give visibility to the terms and conditions on which other providers can purchase wholesale services.

11.68 The publication of an RO helps to ensure stability in markets as, without it, incentives to invest might be undermined and market entry less likely.

11.69 Publication of an RO allows for potentially quicker negotiations, reduces the likelihood of disputes and gives confidence to those purchasing wholesale services that they are being supplied on non-discriminatory terms. Without this, market entry might be deterred to the detriment of the long-term development of competition and hence consumers.

### Our proposals

11.70 We consider that the requirement to publish ROs imposed in previous market reviews has been effective in meeting the aims of the regulation detailed above. Therefore, we

propose that BT should be required to publish an RO for wholesale network access products in each of these wholesale markets.<sup>319</sup>

11.71 The proposed condition requires the publication of an RO and specifies the information to be included in that RO (set out below) and how the RO should be published. It prohibits BT from departing from the charges, terms and conditions in the RO and requires it to comply with any directions we may make from time to time under the condition. The published RO must set out (as a minimum):

- a description of the services on offer including technical characteristics and operational processes for service establishment, ordering and repair;
- the locations of points of network access and the technical standards for network access;
- conditions for access to ancillary and supplementary services associated with the network access, including operational support systems and databases etc;
- contractual terms and conditions, including dispute resolution and contract negotiation/renewal arrangements;
- charges, terms and payment procedures;
- service level agreements and service level guarantees; and
- to the extent that BT uses the service in a different manner to providers or uses similar services, BT is required to publish an RO in relation to those services.

11.72 As we discuss in more detail in Section 15, rather than impose a direction concerning SLAs and SLGs, we propose to include more detailed obligations concerning SLAs and SLGs for wholesale Ethernet services in the RO condition.<sup>320</sup> This is consistent with our approach in other markets, for example WLA. These obligations are:

- an obligation to have SLAs and SLGs for completion of the provision of service;
- an obligation to have SLAs and SLGs for fault repair;
- an obligation to pay SLGs proactively; and
- a requirement that any SLG compensation shall be without prejudice to the rights of either party to claim for additional losses.

11.73 We consider that imposing a requirement to publish an RO is necessary to achieve our aims in each of these wholesale markets where we provisionally find BT has SMP. This remedy complements our proposals to impose network access and non-discrimination requirements on BT to address the competition concerns arising from its SMP in each of these wholesale markets.

11.74 We set out in Section 12 specific requirements that we propose in relation to BT's RO for dark fibre at BT Only exchanges in the inter-exchange connectivity market.

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<sup>319</sup> We set out proposed minimum requirements for BT's Reference Offer for dark fibre access at BT Only exchanges in Section 12.

<sup>320</sup> These proposed obligations do not apply to wholesale WDM circuits. Proposed quality of service remedies for all services are discussed in Section 15.

## Legal tests

- 11.75 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 11.76 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 an access contract. Finally, 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.
- 11.77 We consider that the proposed condition satisfies our duties under section 3, and all the Community requirements set out in Section 4, of the Act.
- 11.78 The requirement to publish an RO will, in combination with a requirement not to discriminate and/or discriminate unduly, facilitate service interoperability and allow providers to make informed decisions about future entry into the relevant market. Further, the obligation will enable buyers to adjust their downstream offerings in competition with BT in response to changes in BT's terms and conditions. Finally, the obligation will make it easier for Ofcom and other providers in the relevant market to monitor any instances of discrimination. Therefore, we consider that the condition in particular furthers the interests of consumers in relevant markets by promoting competition in accordance with Section 3 of the Act.
- 11.79 We also consider that the condition meets the Community requirements set out in Section 4 of the Act. In particular, the condition promotes competition and encourages the provision of network access and service interoperability for the purpose of securing efficiency and sustainable competition for the maximum benefit for consumers. The publication of an RO will mean that other providers will have the necessary information readily available.
- 11.80 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:
- objectively justifiable, in that it requires that terms and conditions are published to encourage competition, provide stability in markets and allow monitoring of anti-competitive behaviour;
  - not unduly discriminatory, in that it is proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
  - proportionate, in that only information that is considered necessary to allow providers to make informed decisions about competing in downstream markets is required to be provided; and
  - transparent, in that it is clear in its intention to ensure that BT publishes details of its service offerings.

- 11.81 Article 9(4) of the Access Directive requires that where network access obligations are imposed, national regulatory authorities shall ensure the publication of an RO containing at least the elements set out in Annex II to that Directive. We are satisfied that this requirement is met.
- 11.82 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in accordance with Section 87(1) of the Act.

### **The BEREC Common Position**

- 11.83 In forming these proposals we have also taken utmost account of the BEREC Common Position including BP16, BP22 and BP23 which appear to us to be particularly relevant in this context. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## **Notification of changes to charges, terms and conditions**

### **Current regulation**

- 11.84 BT is currently required to give advance notice before making changes to its charges or terms and conditions for the provision of network access in each of the relevant markets.

### **Aim and effect of proposed regulation**

- 11.85 Notification of changes to charges at the wholesale level has two aims: assisting transparency for the monitoring of potential anti-competitive behaviour and giving advance warning of charge changes to competing providers who buy wholesale access services. The latter aim ensures that competing providers have sufficient time to plan for such changes, as they may want to restructure the prices of their downstream offerings in response to charge changes at the wholesale level. Notification of changes therefore helps to ensure stability in markets, without which incentives to invest might be undermined and market entry made more difficult.
- 11.86 There may be some disadvantages to advance notification, particularly in markets where there is some competition. It can lead to a chilling effect where other providers follow BT's prices rather than act dynamically to set competitive prices. In HNR areas of the CI Access services market, while competition is more likely, it has not yet developed to the degree that we think such a chilling effect would occur. Rather, by having access to BTs prices, and knowing when they will change, rivals know the level of risk they can take in bidding for contracts. We do not consider, on balance, that this consideration undermines the rationale for imposing a notification of charges condition.
- 11.87 In certain circumstances it may also be appropriate to require the notification of changes to terms and conditions, where this will also ensure transparency and provide advance warning of changes, to allow competing providers sufficient time to plan for them. Again, this assists in providing stability in markets, without which incentives to invest might be undermined and market entry made more difficult.

11.88 This remedy complements the network access and non-discrimination requirements on dominant providers to address the competition concerns arising from a position of SMP in wholesale leased lines markets.

## Our proposals

11.89 We propose to reimpose the obligation on BT to notify changes to its charges, terms and conditions. We propose that the following notification periods should continue to apply:

- 28 days' notice for prices, terms and conditions relating to new service introductions;
- 28 days' notice for price reductions and associated conditions (for example, conditions applied to special offers); and
- 90 days' notice for all other changes to prices terms and conditions.

11.90 In proposing to retain these notification periods, we have considered the following relevant factors:

- in relation to the 90-day period for changes to existing services, the investment required to use wholesale leased line services remains significant and complex, suggesting a shorter period would not be appropriate;
- wholesale leased line services support multiple downstream services. This means that telecoms providers will need to assess the impact of any changes downstream. Typically, this might involve modelling the impact of the new charges on the cost of providing downstream services, securing internal approval for a pricing revision and notifying customers (which may be subject to a minimum notice period);
- too short a notification period would risk that telecoms providers would have insufficient time to react to changes to wholesale terms and could, for instance, be left financially exposed by changes to wholesale charges; and
- there should be no risk of financial exposure for telecoms providers when charges are reduced, so a 28-day notification period is appropriate.

11.91 In the 2018 WLA we amended the SMP condition with respect to extensions and amendments to Special Offers.<sup>321</sup> We considered these amendments were necessary to make it easier for Openreach to amend and extend Special Offers. These are summarised in Table 11.1 below.

**Table 11.1: Summary of amendments to the Special Offer**

Amendment	Amendment concerns	Notification period
If Openreach wants to extend a Special Offer at the current SO price or lower price and current T&Cs	Prices and T&Cs	Next working day
If Openreach wants to extend a Special Offer on current T&Cs at a price above the initial Special Offer price but below the standard price	Prices	28 days

<sup>321</sup> 2018 WLA Statement, paragraphs 6.184-5.

If Openreach wants to extend a special offer on updated T&Cs or amend T&Cs of existing Special Offer, irrespective of price	T&Cs	28 days
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11.92 We propose to mirror these amendments in business connectivity markets.

## Legal tests

11.93 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.

11.94 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, for the purpose of securing transparency, all such information in such manner as Ofcom may direct. Section 87(6)(c) also permits the setting of SMP services conditions requiring the dominant provider to publish the terms and conditions on which he is willing to enter into an access contract.

11.95 We consider that the proposed condition satisfies our duties under section 3, and all the Community requirements set out in section 4, of the Act. In particular, the condition is aimed at promoting competition, and securing efficient and sustainable competition for the maximum benefits for consumers. This is achieved by ensuring that providers have the necessary information about changes to terms, conditions and charges sufficiently in advance to allow them to make informed decisions about competing in downstream markets.

11.96 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:

- objectively justifiable, in that there are clear benefits from the notification of changes in terms of ensuring that providers are able to make informed decisions within an appropriate time frame about competing in downstream markets;
- not unduly discriminatory, as it is proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
- proportionate, as 90 days is considered the minimum period necessary to allow competing providers to plan for changes to existing network access, and 28 days would be sufficient for new network access and price reductions; and
- transparent in that it is clear in its intention to ensure that BT provides notification of changes to its charges, terms and conditions.

11.97 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

## The BEREC Common Position

11.98 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP16 and BP17.

## Notification of changes to technical information

### Current regulation

- 11.99 The existing condition requires BT to notify new technical information within a reasonable period of time but not less than 90 days in advance of providing new wholesale services or amending existing technical terms and conditions.

### Aim and effect of proposed regulation

- 11.100 The aim of this proposed condition is to ensure that telecoms providers have sufficient time to respond to technical changes that may affect them. For example, a telecoms provider may need to introduce new equipment, or modify existing equipment or systems, to support a new or changed technical interface. Similarly, a telecoms provider may need to make changes to its network to support changes in the points of network access or configuration.
- 11.101 We consider that this condition is important in each of the markets in which we consider that BT has SMP, as it ensures that telecoms providers who compete in downstream markets are able to make effective use of wholesale services provided by BT. Technical information includes new or amended technical characteristics, including information on network configuration, locations of the points of network access and technical standards (including any usage restrictions and other security issues).

### Our proposals

- 11.102 We consider that the requirement to notify technical information is necessary to give other telecoms providers an opportunity to consider how to respond to the changes and allow sufficient time to prepare for them. Therefore, we consider it is appropriate to reimpose the requirement in this market review.
- 11.103 The proposed condition requires the notification of new technical information within a reasonable time period, but not less than 90 days in advance of providing new wholesale services or amending existing technical terms and conditions. We consider that 90 days is the minimum time that competing providers need to modify their network to support a new or changed technical interface, or support a new point of access or network configuration.
- 11.104 The requirement to give notification within a reasonable time period may mean that a period of notification in excess of 90 days may also be appropriate in certain circumstances. For example, if BT were to make a major change to its technical terms and conditions, a period of more than the 90-day minimum might be necessary to enable competing providers sufficient time to prepare without disruption and detriment to their businesses and customers.

11.105 In the 2018 WLA Statement<sup>322</sup> we noted that the one exception to the 90 day minimum is in relation to amendments to technical specifications that are developed and agreed through NICC Standards Limited. NICC is a technical forum in which BT and other telecoms providers participate. Therefore, telecoms providers are likely to be aware of NICC specifications due to their participation in the forum. We therefore did not consider it necessary to impose a 90-day notice period where BT proposes to adopt an amended NICC specification. However, we considered that BT should provide notification of changes based on the NICC standard. We propose to mirror this amendment in business connectivity markets.

## Legal tests

- 11.106 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 11.107 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, in such manner as Ofcom may direct, all such information, for the purpose of securing transparency. Section 87(6)(c) also permits the setting of SMP services conditions requiring the dominant provider to publish the terms and conditions on which he is willing to enter into an access contract.
- 11.108 We consider that the proposed condition satisfies our duties under section 3, and all the Community requirements set out in section 4, of the Act. In particular, the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefits for consumers by ensuring that providers have sufficient notification of technical changes to CI services to enable them to compete in downstream markets.
- 11.109 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:
- objectively justifiable, in that it enables providers to make full and effective use of network access to be able to compete in downstream markets;
  - not unduly discriminatory, as it is proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
  - proportionate, in that 90 days is the minimum period that Ofcom considers is necessary to allow competing providers to modify their networks; and
  - transparent, in that it is clear in its intention that BT notify changes to technical information in advance.
- 11.110 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

## The BEREC Common Position

11.111 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP16 and BP17.

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<sup>322</sup> 2018 WLA Statement, paragraph 6.196.

## Regulatory financial reporting

- 11.112 In the following sub-sections, we propose to reimpose cost accounting and accounting separation obligations on BT in the markets in which we propose it has SMP. We propose to implement these obligations by way of a single SMP Condition.
- 11.113 Our proposed accounting separation and cost accounting obligations are underpinned by detailed requirements for regulatory financial reporting which specify what information we require BT to prepare and provide in the markets in which it has SMP. We will set out proposals for updating these detailed reporting requirements in our forthcoming consultation on regulatory reporting.
- 11.114 Consistent with our approach in the 2016 BCMR, and in subsequent market reviews in other markets (WLA and WBA), we are proposing to adopt the form of conditions first set out in our 2014 Regulatory Financial Reporting Statement.<sup>323</sup> This has the benefit of ensuring a consistent approach to regulatory financial reporting across the markets in which BT is regulated.

## Cost accounting

### Current regulation

- 11.115 BT is currently subject to a cost accounting obligation in the business connectivity markets in which it has SMP.

### Aim and effect of proposed regulation

- 11.116 Recital 2 of the 2005 Recommendation states that the purpose of imposing accounting separation and cost accounting obligations is “to make transactions between operators more transparent and/or to determine the actual costs of services provided”. Also, paragraph 2 of Point 1 of the 2005 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.”
- 11.117 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. The imposition of cost accounting obligations on BT is an important means of ensuring that:

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<sup>323</sup> Ofcom, 2014. *Regulatory Financial Reporting – Statement* (2014 Regulatory Financial Reporting Statement). [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0025/78460/financial-reporting-statement-may14.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0025/78460/financial-reporting-statement-may14.pdf).

- we have the necessary information to support the monitoring of the effectiveness of pricing remedies, 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 ultimately be needed;
- wholesale costs are attributed across the wholesale markets (and the individual services within them) in a consistent manner. This mitigates in particular against the risk of double recovery of costs or that costs might be loaded onto particular products or markets;
- publication (i.e. reporting) of cost accounting information aids transparency, providing reasonable confidence to stakeholders about compliance with SMP obligations, allowing stakeholders to monitor compliance and more generally enabling stakeholders to make better informed contributions to the development of the regulatory framework; and
- BT records all the 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 strong possibility that the necessary information would not be available when it is required and in the necessary form and manner.

## Our proposals

11.118 We are proposing to re-impose the cost accounting requirements on BT in each of the wholesale leased lines markets in which we propose that it has SMP. We consider that this obligation is necessary to ensure the appropriate maintenance of accounts to monitor BT's activities with regard to the pricing remedies we propose in each of these markets.

## Legal tests

11.119 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.

11.120 Section 87(9) to (11) (subject to section 88) of the Act authorises Ofcom to impose appropriate cost accounting obligations on dominant providers, in respect of the provision of network access, the use of the relevant network and the availability of relevant facilities. Cost accounting rules may be made in relation to fair and reasonable charges, charge controls, the recovery of costs and basis of charges obligations.

11.121 We have considered our statutory obligations and the Community requirements set out in Sections 3 and 4 of the Act. In particular, we consider that the imposition of the proposed cost accounting obligation is justifiable and proportionate to promote competition in relation to the provision of electronic communications networks and services and to ensure the provision of network access (including supporting ancillary services) and service interoperability for the purpose of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of providers. This is because the imposition of the obligation will ensure that other obligations designed to curb potentially damaging leverage of market power, including imposing a price squeeze and setting prices at excessive levels, can be effectively monitored and enforced.

- 11.122 We have considered the Community requirements set out in Section 4 of the Act and believe that the proposed cost accounting obligations in particular promote competition in relation to the provision of electronic communications networks and encourage the provision of network access for the purpose of securing efficiency and sustainable competition in downstream markets for electronic communications networks and services, resulting in the maximum benefit for retail consumers.
- 11.123 We consider that the proposed condition meets the criteria set out in Section 47(2) of the Act because it is:
- objectively justifiable, in that it is necessary to ensure the appropriate maintenance and provision of accounts to monitor BT’s activities with regard to the pricing remedies we propose in each of these markets. It also relates to the need to ensure competition develops fairly, to the benefit of consumers, by providing transparency of BT’s compliance with rules set to address the risk of excessive pricing;
  - non-discriminatory, in that BT is the only provider on which we propose to impose specific pricing remedies;
  - proportionate, in that only information that is no more than necessary to monitor BT’s activities with regard to the pricing remedies we propose is required to be maintained and provided; and
  - transparent, in that it is clear in its intention to ensure the appropriate maintenance and provision of accounts for the purposes set out above and the particular accounting separation requirements of BT are clearly documented.
- 11.124 In setting such a condition, we must also ensure that the network access pricing conditions set out in Section 88 are also satisfied.
- 11.125 We consider that imposing a cost accounting obligation is consistent with section 88. We also consider that imposing a cost accounting obligation is necessary for our price regulation obligations to be effective.
- 11.126 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### **The BEREC Common Position**

- 11.127 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP30 to BP37.

## **Accounting separation**

### **Current regulation**

- 11.128 BT is currently subject to an accounting separation obligation in the business connectivity markets in which it has SMP.

## Aim and effect of proposed regulation

- 11.129 Paragraph 3 of Point 1 of the 2005 Recommendation states that “the purpose of imposing an obligation regarding accounting separation is to provide a higher level of detail of information than that derived from the statutory financial statements of the notified operator, to reflect as closely as possible the performance of parts of the notified operator’s business as if they had operated as separate businesses, and in the case of vertically integrated undertakings, to prevent discrimination in favour of their own activities and to prevent unfair cross-subsidy”.
- 11.130 In the 2014 Regulatory Reporting Statement we considered the purposes of regulatory reporting, which is supported by the imposition of an accounting separation obligation. In that statement we said that regulatory reporting “should provide us with the information necessary to make informed regulatory decisions, monitor compliance with SMP conditions, ensure that those SMP conditions continue to address the underlying competition issues and investigate potential breaches of SMP conditions and anti-competitive practices”. In addition, we said that it “should provide reasonable confidence to stakeholders that the SMP provider has complied with its SMP conditions and add credibility to the Regulatory Financial Reporting Regime”. We consider that our proposal to impose an accounting separation obligation, together with a cost accounting obligation (see below), will help to ensure that these regulatory reporting objectives are met.
- 11.131 The accounting separation obligation requires BT to account separately for internal and external sales, which allows Ofcom and other providers to monitor the activities of the party subject to regulations to ensure that it does not discriminate unduly in favour of its own downstream businesses.

## Our proposals

- 11.132 We are proposing to reimpose the accounting separation obligation on BT in each of the wholesale leased lines markets in which we propose that it has SMP. We consider that this obligation is necessary to monitor BT’s activities with regard to its non-discrimination obligations.
- 11.133 The SMP conditions and directions that we refer to in relation to cost accounting above also apply to the accounting separation obligations. We are proposing to impose those SMP conditions and directions in continuation of previous regulatory standards.

## Legal tests

- 11.134 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 11.135 Sections 87(7) and 87(8) of the Act authorise Ofcom to impose appropriate accounting separation obligations on a dominant provider in respect of the provision of network access, the use of the relevant network and the availability of relevant facilities. That is to say, the dominant provider may be required to maintain a separation for accounting

purposes between such different matters relating to network access or the availability of relevant facilities.

- 11.136 We consider that this proposal meets our duties under Sections 3 and 4 of the Act. We consider that the imposition of an accounting separation obligation promotes competition in relation to the provision of electronic communications networks and services, ensuring the provision of network access and service interoperability for the purposes of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of providers. This is because the imposition of the obligation would ensure that other obligations designed to curb potentially damaging leveraging of market power, in particular the requirement not to unduly discriminate, can be effectively monitored and enforced.
- 11.137 With regard to the Community requirements set out in Section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, we believe section 4(8) is met, where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by helping to ensure that dominant providers comply with other obligations in particular non-discrimination requirements.
- 11.138 We also consider that this proposal meets Section 47(2) of the Act which requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. We consider the proposed condition is:
- objectively justifiable, as it relates to the need to ensure competition develops fairly to the benefit of consumers;
  - not unduly discriminatory as it is only imposed on BT, which is the only provider which we propose to find has SMP in the relevant markets in the UK excluding the Hull Area;
  - proportionate, in that it is the least onerous obligation necessary as a mechanism to allow us and third parties to monitor potentially discriminatory behaviour by BT; and
  - transparent, in that it is clear that the intention is to monitor compliance with specific remedies and the particular accounting separation requirements of BT are clearly documented within the SMP condition.
- 11.139 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### **The BEREC Common Position**

- 11.140 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP30 to BP37.

### **Consultation question**

- 11.141 Having set out above our considerations and proposals, we invite stakeholders to respond to the following question:

Question 11.1: Do you agree with the general remedies that we propose? Please provide reasons and evidence in support of your views.

## 12. Specific dark fibre remedy for inter-exchange connectivity

- 12.1 We propose to introduce a requirement for BT to provide access to dark fibre on reasonable request for inter-exchange connectivity circuits from BT Only exchanges. In Section 10 we explained that a dark fibre remedy in inter-exchange connectivity could significantly reduce backhaul costs. It could therefore promote competition, not only in the provision of backhaul between exchanges where there are no or insufficient competitive networks, but also by acting as an enabler for infrastructure build in marginal access areas, as backhaul costs are a consideration when building new access networks. We therefore consider that a dark fibre remedy in inter-exchange would, alongside other remedies, assist with the removal or reduction of barriers to network expansion and promote competition in markets where BT has SMP.
- 12.2 We propose to introduce a cost-based charge control for dark fibre services set with reference to the relevant components of BT's underlying passive infrastructure necessary for connections between exchanges. We expect the prices will be substantially lower than the current active products used for inter-exchange, though purchasers of dark fibre will also be liable for non-domestic rates (NDRs) when lighting the fibre. The proposed pricing arrangements are likely to mean that it is cost effective to use regulated dark fibre for most bandwidths for inter-exchange connections rather than purchasing regulated active products. The proposed dark fibre pricing will vary according to the length of the circuit.
- 12.3 In this section we set out:
- our proposal to require BT to provide network access to dark fibre on reasonable request for inter-exchange circuits from BT Only exchanges. We explain the aims and effect of introducing dark fibre, including a discussion of the benefits and risks associated with introducing dark fibre and expected take-up of the remedy. We then set out our proposals for scope of the remedy and design of the remedy;
  - the minimum requirements for the Reference Offer (RO);
  - a proposed timeline for implementation; and
  - our proposed approach to pricing.

### Aims and effect of our proposed dark fibre access remedy

- 12.4 Dark fibre is a passive fibre connection between two sites and is so called because there is no equipment at either end to light the fibre. This contrasts with an active connection which includes electronics at either end of the fibre connection. Dark fibre providers install and sell optical fibre to connect between two sites, with the purchaser of the dark fibre adding the active electronics to provide point-to-point business connectivity services. BT does not currently offer dark fibre.

## Benefits of dark fibre

- 12.5 Inter-exchange circuits available from Openreach are an active product. The characteristics of the service are determined by choices made by Openreach and developments negotiated with the industry as a whole. Access to dark fibre in inter-exchange connectivity would provide users with a more flexible input to downstream services. This has the potential to deliver several benefits:
- users would be able to choose their own electronic equipment, enabling them to deliver services that better suit their needs and the needs of their customers;
  - users would be able to make efficient decisions on bandwidth upgrades based on the underlying costs of upgrades;
  - users would be able to eliminate inefficient active equipment duplication; and
  - users would potentially be able to deliver improvements more quickly than they can currently.
- 12.6 These benefits would in turn allow providers to better compete on price, service quality and product offering in downstream markets.

### Dark fibre provides choice over active equipment

- 12.7 Under the current set of active remedies, Openreach chooses the electronic equipment that is used to deliver the active part of a leased line service and the functions of this equipment that are made available as part of the service.
- 12.8 The proposed dark fibre remedy would let customers choose their own electronic equipment. This would enable them to choose the equipment and functions that best fit their needs and the needs of customers of their downstream services. Where this differs from the equipment and features provided by Openreach, dark fibre users would have greater flexibility to implement these changes.
- 12.9 For example, providers that serve their customers both by accessing BT's network and by operating their own fibre network will be better able to harmonise the solutions they provide using their own networks with those they provide using BT's network. There may also be scope for providers to combine their own network and BT's dark fibre to deliver alternative network designs. However, we recognise that the extent to which these benefits can be realised may be limited by the scope of this dark fibre remedy. Under our proposals, dark fibre would not be available for connectivity between all exchanges, nor in the access layer, and harmonising solutions may require control over active equipment across the network.

### Cost of upgrading would reflect the underlying cost

- 12.10 As discussed in Section 2 and Annex 7, bandwidth demand is growing rapidly. This means that providers need to increase bandwidth in their backhaul networks and will have to upgrade the bandwidth of existing inter-exchange circuits.
- 12.11 When using BT's active products to upgrade the bandwidth of a connection, users have to migrate to a higher bandwidth product or purchase an additional circuit of the same

bandwidth. BT's charges have historically followed a bandwidth gradient, which has been greater than equipment cost differentials alone, particularly for VHB services (which have historically not been regulated).

- 12.12 This means that the incremental price of upgrading bandwidth is generally greater than the incremental cost of equipment needed to deliver higher bandwidth (particularly from 1 Gbit/s to 10 Gbit/s), and that margins are significantly higher on VHB circuits. This may lead to providers not upgrading when it would be efficient for them to do so based on the underlying costs. For example, our analysis in Annex 7 indicates that over a three-year period the unit FAC differential between an EAD 10 Gbit/s and 1 Gbit/s service is £1,558, but the unit price differential is £3,866.<sup>324</sup> An operator may be willing to pay the cost differential to upgrade, but the high price premium may mean it does not. This could have consequences for downstream access services, as it would affect the willingness of providers to offer VHB access services if this would necessitate costly investment in increasing backhaul bandwidth.
- 12.13 The price of dark fibre under our proposed remedy would be independent of bandwidth and providers would have access to the full capacity of the equipment connected to the fibre. Providers may also use dark fibre as a means of aggregating circuits. For example, rather than purchasing two EAD 10 Gbit/s they may purchase a single dark fibre circuit. As a result, the incremental cost to providers of upgrading bandwidth would reflect just the incremental costs of the equipment required to deliver higher bandwidth or aggregate circuits, which in some cases may be zero (or close to zero). This lowers the cost of upgrading bandwidth and ensures more efficient upgrade decisions based on true incremental costs.
- 12.14 As providers face the true incremental cost of upgrading, they may be more likely to upgrade backhaul capacity earlier, potentially allowing them to offer faster services to downstream access customers in mobile, broadband and business connectivity. Lower cost or higher quality inter-exchange connectivity could act as an enabler to investment in these access services.
- 12.15 We note the benefit of more cost-reflective pricing described could also be achieved in principle through regulating active services to an appropriate standard of cost, rather than with the proposed dark fibre remedy. However, this would not be compatible with allowing the flexibility for BT to charge according to a bandwidth gradient.<sup>325</sup> In addition, there are additional benefits to dark fibre such as reducing inefficient duplication and potentially enabling new service features to be introduced more easily and quickly. We set these out in the next two sub-sections.

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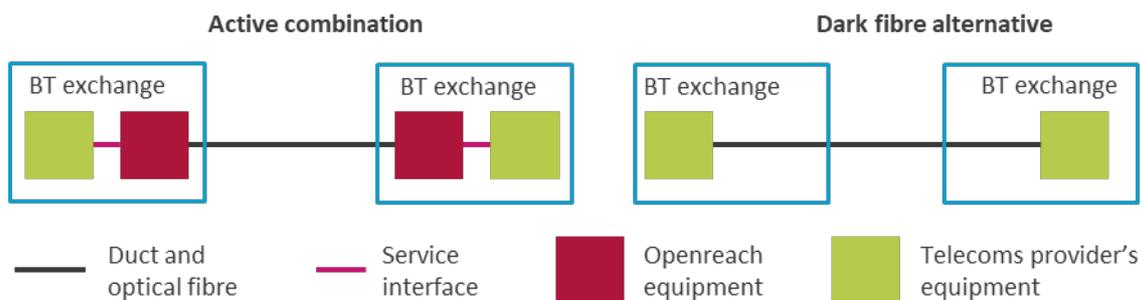
<sup>324</sup> Ofcom analysis based on BT's 2016/17 RFS and Openreach prices as at April 2018. Costs and prices are stated on a Total Cost of Ownership (TCO) basis and includes rental, connection and main link charges. Connection costs are spread over a three-year period and discounted using a 9% WACC. For main link costs we have assumed 5km link distance. See Figure A7.2.

<sup>325</sup> The impact of the proposed dark fibre remedy on BT's ability to efficiently recover costs is discussed below.

**Inefficient equipment duplication reduced**

- 12.16 Dark fibre also gives rise to lower overall costs as it reduces the overall amount of equipment employed compared to the current use of active products. These benefits could not be achieved through the regulation of active services alone.
- 12.17 Electronic components are a material proportion of the costs of providing a leased line service. As an illustration, electronics comprise approximately £573 (23%) of the costs allocated to an Openreach EAD 1 Gbit/s circuit.<sup>326</sup> Providers generally also connect their own electronic equipment to each end of the Openreach active circuit, to provide additional control over the service (e.g. better monitoring capabilities), traffic and circuit aggregation functionality, downstream service features, and/or onward routing of the connection.
- 12.18 The equipment used by telecoms providers in BT exchanges has comparable functionality to Openreach’s equipment. A significant opportunity for cost savings, therefore, relates to reduced equipment duplication because the provider’s equipment can be configured to replicate and replace the functions of Openreach’s electronic equipment. The use of dark fibre will mean that, in many cases, the equipment can be consolidated and therefore savings can be made – both in terms of the cost of the equipment, as well as the associated need for space and power to operate it.
- 12.19 In inter-exchange connectivity, our understanding is that in a significant majority of cases providers would have electronic equipment at both ends of an active service. For circuits within scope of the inter-exchange dark fibre remedy, each end terminates in a BT exchange, from which providers would need to route traffic onward. Accordingly, dark fibre provides the potential for consolidation and reduced duplication at each end of the circuit. Figure 12.1 illustrates this equipment use scenario.

**Figure 12.1: Change in equipment used for active and dark fibre inter-exchange circuits**



Source: Ofcom.

- 12.20 Respondents to our 2017 Dark Fibre Consultation noted likely savings due to equipment efficiencies in inter-exchange connectivity (or backhaul). TalkTalk indicated that for

<sup>326</sup> BT 2018 Regulatory Financial Statements, page 41, excluding main link costs.

backhaul the amount of equipment used would be reduced with the introduction of dark fibre. At each end the Openreach NTE (network terminating equipment electronics) would be replaced by an SFP (small form pluggable – an optical transceiver), which are a third of the cost of NTEs.<sup>327</sup> Sky responded that an unconstrained dark fibre remedy would result in material benefits from the reduced duplication of equipment in backhaul.<sup>328</sup> Internal documents provided by BT as part of the 2016 BCMR indicated that the use of dark fibre in backhaul could deliver equipment savings for downstream BT in a number of cases.<sup>329</sup>

- 12.21 Other providers who responded to our 2017 Dark Fibre Consultation generally expected to see a reduction in the equipment used at either one or both ends of circuits after the implementation of dark fibre. At least some of these use cases would be likely to involve inter-exchange connectivity. [Redacted]<sup>330</sup> and [Redacted]<sup>331</sup> both responded that [Redacted], and so dark fibre would result in significant equipment savings.
- 12.22 In some cases, a provider will be able to absorb the functionality of Openreach equipment into the electronics they would have in place when using an active service. This would allow them to replicate the connectivity they get from an Openreach active circuit, without needing to add additional equipment. This is particularly likely to be the case for circuits which would otherwise have been provided using an EAD product. We estimate this represents the significant majority ([Redacted]%) of current inter-exchange connectivity sold by Openreach from BT Only exchanges (see Table 12.2). The efficiency gain in this instance would be equivalent to the cost of the Openreach equipment which is no longer required at each end of the circuit.
- 12.23 In some cases, efficiency gains may be lower as providers will need to add additional equipment over that which would be in place when purchasing an active service. An example of this is multiple high bandwidth circuits using WDM technology, where providers may need to add multiplexing equipment to a dark fibre alongside the equipment they would put in place when consuming an equivalent active service. This technology is more likely to be deployed for bandwidths in excess of 10 Gbit/s, or over long distances. We estimate this could be the case in only a small minority [Redacted]% of current inter-exchange connectivity sold by Openreach from BT Only exchanges, based on current sales of Openreach OSA WDM products (the product is described in Section 3).
- 12.24 In some instances, the replacement of active circuits with dark fibre could also result in additional fibre being used – increasing duplication of fibre to some extent. EBD circuits (which involve multiple customers sharing fibre) may be replaced by multiple dark fibre circuits, potentially increasing the total volume of fibre in use. EBD makes up a small proportion [Redacted]% of current inter-exchange connectivity sold by Openreach from BT Only exchanges. However, this increased duplication of fibre is only likely to occur where

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<sup>327</sup> TalkTalk response to 2017 Dark Fibre Consultation.

<sup>328</sup> Sky response to 2017 Dark Fibre Consultation.

[https://www.ofcom.org.uk/data/assets/pdf\\_file/0015/110661/Sky.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0015/110661/Sky.pdf).

<sup>329</sup> DC (15)143, Design Council, Dark Fibre BT Group Commercial response: Strategy (Slide 14), BT response to the 13th s.135 notice for the 2016 BCMR (dated 10 September 2015).

<sup>330</sup> [Redacted] response to 2017 Dark Fibre Consultation.

<sup>331</sup> [Redacted] response to 2017 Dark Fibre Consultation.

Openreach's pricing of EBD active services does not fully reflect the cost savings from sharing of infrastructure. Dark fibre may therefore provide an incentive for Openreach to adjust its pricing to reflect these efficiencies. Providers may also prefer to purchase their own dedicated fibre as it allows them to benefit from increased flexibility, as discussed below.

- 12.25 We consider that current active circuit sales for inter-exchange connectivity suggest cost savings from reduced equipment duplication would be available in the majority of cases. As many of these circuits currently have bandwidths of 1 Gbit/s, and we expect significant scope for savings up to and including 10 Gbit/s, and opportunities to reduce equipment duplication will remain even if bandwidth demand expands.
- 12.26 Providers may need to invest in systems and processes to manage services provided over dark fibre. This might also include recruitment of a field force to install and maintain equipment. In addition, potential users of dark fibre in inter-exchange connectivity may have existing equipment in place, in which case they would already have this capability and require minimal additional investment.
- 12.27 In any event, in instances where potential net savings are lower, we would expect less take-up of dark fibre. Active services will remain available and would be used where they are more cost-effective than dark fibre.

#### **Service feature innovations may be easier and quicker to introduce**

- 12.28 With current active services, any new service feature developed by Openreach (even if it is developed at the specific request of a sole provider) must be offered to all customers at the same time and on the same terms under BT's no undue discrimination obligation. However, the process of debating and negotiating development requirements with Openreach and with other telecoms providers may introduce additional development time, costs or uncertainties. This may mean that certain service features are not economic to develop across the industry, but could be economic for a single provider to deploy.
- 12.29 We recognise that the scope of dark fibre may place some limits on the extent to which new services or service features can be introduced across a provider's whole network. If providers deliver downstream services using Openreach active products in access, then these would set the service features for that downstream product and may limit the extent to which dark fibre could enable changes to overall service features. Nonetheless, dark fibre offers greater potential to adopt new service features when compared to active products. In particular, dark fibre users would be able to implement service feature changes more quickly, at lower cost and based on their own assessment of their customers' needs.

#### **OSA Filter Connect does not replicate all the benefits of dark fibre**

- 12.30 Openreach has recently launched a product called OSA Filter Connect. This WDM product includes an active 10 Gbit/s circuit managed by Openreach, provides flexibility for telecoms providers to add their own equipment to other wavelength channels and provides low-cost bandwidth upgrades through the addition of additional channels.

- 12.31 OSA Filter Connect provides additional flexibility over other active services, and therefore may deliver some of the benefits of dark fibre described above. At the same time, it is a managed service, meaning providers may not have to invest in the same systems and processes as they would for dark fibre.
- 12.32 However, OSA Filter Connect does not replicate all the benefits of dark fibre. As the base product includes a 10 Gbit/s active circuit, there may still be equipment duplication and hence scope for some cost savings. In addition, the product's cost base means that it is more expensive than an equivalent active product or dark fibre-based product for bandwidths of 10 Gbit/s and below, and so would likely only be suitable for those with requirements for bandwidth over 10 Gbit/s.
- 12.33 A dark fibre remedy would allow users to choose the most appropriate solution for their needs and put downward pressure on the price of OSA Filter Connect, as alternative providers could offer competing services to OSA Filter Connect using dark fibre as a component. Alternative providers could also use dark fibre to compete on other dimensions such as quality or product offering, and so may encourage BT to make improvements to the OSA Filter Connect product.

## Risks of dark fibre

- 12.34 In this sub-section we set out the potential adverse consequences that could arise as a result of our proposed remedy. We consider whether the proposed dark fibre remedy has the potential to:
- weaken incentives of rival providers to invest in backhaul network and services;
  - have an adverse impact on economic efficiency as a result of erosion of the bandwidth gradient;
  - result in stranded assets for BT;
  - create incentives for telecoms providers to arbitrage by using dark fibre for short distances and EBD for longer connections; or
  - result in an increase in faults or make it harder to detect and repair faults.

### Impact on incentives to invest

- 12.35 We have considered carefully the likely impact on rival investment. We recognise that there is a risk that a dark fibre remedy could deter competitors from connecting to BT exchanges to provide backhaul services and generally undermine the provision of backhaul and core connectivity services. We consider and address these risks below, in the "Scope of the remedy" sub-section. We explain that we propose to limit the scope to routes from BT Only exchanges. Limiting the scope of the remedy to exchanges where network-based competition is least likely means that the impact on rival investment is likely to be small.

### Impact on efficient cost recovery

- 12.36 It is not practical to implement a dark fibre remedy that is priced according to the bandwidth a customer uses. Therefore, a single price for the dark fibre product is likely to

reduce BT's ability to price its active services above cost, particularly for VHB services. One of the key benefits of dark fibre as described above is that the incremental cost to providers of upgrading bandwidth would reflect just the incremental cost of equipment required to deliver higher bandwidth. This lowers the cost of upgrading bandwidth and ensures more efficient upgrade decisions.

- 12.37 We have considered whether the ability to scale up bandwidth more flexibly and at cost may undermine BT's ability to price according to a bandwidth gradient<sup>332</sup> and have a detrimental impact on BT's ability to recover costs efficiently. We acknowledge that in theory a bandwidth gradient can allow a more efficient recovery of common costs relative to a flat pricing structure. This could be the case if high prices for high bandwidth products allowed lower prices for lower bandwidth products, expanding total output. However, in the context of BT's sales of leased lines there is minimal evidence to suggest that a flattening of the bandwidth gradient will result in an adverse impact on economic efficiency.
- 12.38 The evidence does not suggest that the existing (published April 2018) higher prices for VHB services are required for BT to recover its common costs. For many costs, BT's allocation of costs to products does not depend on bandwidth.<sup>333</sup> Higher prices for VHB circuits do not materially reduce the amount of common costs allocated to lower bandwidth products.
- 12.39 The existing charge control basket for circuits 1 Gbit/s and below ensures BT can recover its common costs based on a flat allocation of costs to bandwidth.<sup>334</sup> Our analysis shows that for 2016/17 BT has priced to the cap allowed within the charge control. BT has therefore recovered this flat allocation of common costs for the charge-controlled products, without the need for additional contributions from VHB services.

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<sup>332</sup> BT needs to make sufficient profit to cover its costs. This includes covering its common costs, i.e. indirect costs such as overheads that cannot be attributed to the supply of a specific product. The most (allocatively) efficient way to recover these costs is for BT to charge prices that are sufficiently high to recover common costs, but that are structured in a way that allows as many customers as possible to buy leased lines. This could mean charging higher prices to customers with higher willingness to pay, usually those purchasing higher bandwidths, and lower prices to customers with a lower willingness to pay. This type of pricing structure is known as a bandwidth gradient.

<sup>333</sup> BT's prices for lower bandwidth products are set based on compliance with the charge control. Ofcom's leased line charge controls are currently set based on BT's costs. These controls are designed to allow recovery of costs that do not vary by bandwidth for all passive components (e.g. duct and fibre costs) or for many of the common costs associated with active elements (e.g. Systems development, Ethernet Monitoring platform and accommodation costs). Some costs (Ofcom Admin Fee, Openreach Sales Product Management and Revenue Receivables) are allocated based on revenue, so that lower VHB prices would reduce the share allocated to VHB, but these costs only account for a small proportion of total costs (less than 2% of the total costs allocated to an EAD 1 Gbit/s circuit, for example). Ethernet Electronics (which include overheads) are allocated based on the relative price of the electronics used to provide the service, so higher bandwidth circuits with more expensive electronics will be allocated a higher share of these overheads. See BT's 2017 Regulatory Financial Statements, <https://www.btplc.com/Thegroup/Policyandregulation/Governance/Financialstatements/2017/RRD2017Final.pdf> and BT's Accounting Methodology Document, <https://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2018/AMD2017-18.pdf>. [accessed 30 October 2018].

<sup>334</sup> As will the proposed structure of the charge control.

- 12.40 The evidence also does not suggest that the current pricing structure is expanding total sales. Therefore, we do not consider that our proposed dark fibre remedy is likely to result in an adverse impact on allocative efficiency through a reduction in total sales due to higher prices for lower bandwidth products. Lower bandwidth services already recover costs, so a reduction in the price of VHB services does not need to be offset by a rise in lower bandwidth prices.
- 12.41 There is also significant evidence to suggest that the bandwidth gradient is already flattening and has limited impact on expanding total sales:
- In its internal documents BT notes: “[Redacted]”.<sup>335</sup> This view is consistent with BT’s latest announced price reductions from October 2018, where it reduced the price of 1 Gbit/s but left the price of 100 Mbit/s unchanged.
  - Figure A7.3 shows that, over time, BT’s Ethernet prices are declining and the price gap across bandwidths is narrowing. The latest pricing announcement taking effect from 1 October 2018 results in a price differential of less than 10% between 100Mbit/s and 1 Gbit/s, down from 23%.<sup>336</sup>
  - Openreach has launched the new OSA Filter Connect product. In its internal documents Openreach notes that OSA Filter Connect, “[Redacted]”.<sup>337</sup> It notes that part of the reason for introducing the new product is to remain competitive, address new market opportunities and meet the needs of its customers.
- 12.42 Therefore, we do not consider that the proposed dark fibre remedy will have an adverse impact on economic efficiency or BT’s ability to recover appropriately incurred costs. It is more likely that the proposed dark fibre remedy will improve economic (allocative) efficiency by bringing prices closer to costs, particularly for VHB services.

### Stranded assets for BT

- 12.43 There could be a risk of stranded investments because of the proposed dark fibre remedy, i.e. there is a risk that investment in infrastructure that BT has made becomes obsolete or cannot be used. If such stranded assets are not appropriately taken into account in setting the price for BT’s remaining services, this could lead to perceived regulatory instability or uncertainty which could reduce BT’s incentives to invest in infrastructure in the future.
- 12.44 We consider that the risk of stranded assets is low and mainly limited to the active layer, i.e. the electronics. The main passive infrastructure, such as existing ducts, would continue to be used in the provision of the dark fibre remedy.

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<sup>335</sup> Openreach response to Question 4 of the 8th s.135 notice dated 20 April 2018, document entitled “Leased Lines Charge Control Ethernet Prices for April 2018”, dated 26 February 2018, page 2.

<sup>336</sup> Prices are calculated on a Total Cost of Ownership (TCO) basis and include rental, connection and main link charges. Based on an annual rental price of £1,698 for EAD 100Mbit/s pre and post 1 October 2018 and £2,460 for EAD 1000Mbit/s pre 1 October 2018 and £1,944 post 1 October 2018. Connection charges are the same for both products, spread over a three-year period and discounted using a 9% WACC. For main link charges, we assume a 5km link distance. <https://www.openreach.co.uk/orpg/home/products/pricing/loadProductPriceDetails.do?data=Od0zetWgShsjqKWjcN2Y5WJA8BGGqsBLxL7lgSM4fRpZ6rNZujnCs99NblKJZPD9hXYmijxH6wr%0ACQm97GZMyQ%3D%3D> [accessed 25 October 2018].

<sup>337</sup> Openreach response to Question 4 of the 8th s.135 notice dated 20 April 2018, document entitled “New pricing and product launches for VHB portfolio”, dated 22 January 2018, page 2.

- 12.45 The electronics have a comparatively shorter lifespan compared to the passive infrastructure and the cost of the electronics is small relative to the cost of the passive infrastructure (see Section 3). We expect BT to recover the majority of its circuit-specific costs across the contract period and therefore consider the risk of stranded electronics to be very low.
- 12.46 Dark fibre may result in additional aggregation opportunities which could cause some fibre to become stranded if it cannot be reused to provide an additional dark fibre circuit or another active service. As set out above, aggregation is an important benefit as it allows for more efficient upgrading of bandwidth.
- 12.47 We also note that there are already very strong incentives to aggregate. For example, a telecoms provider requiring more than 10 Gbit/s already has an incentive to upgrade to OSA Filter Connect.
- 12.48 Therefore, we consider that the additional incentives to aggregate because of the introduction of dark fibre are small, and any incremental stranded fibre is likely to be small.

### Incentives to arbitrage

- 12.49 The proposed dark fibre remedy will be priced on a per kilometre basis. EBD circuits are not priced on a per kilometre basis. There may be incentives for customers to use dark fibre for relatively shorter connections and EBD for the longer connections. If the costs of providing circuits are higher over longer distances but the price does not vary, and the typical EBD circuit increases in length as a result of dark fibre, there is a risk that BT would not be able to recover its costs.
- 12.50 We do not consider that this is a material risk. Our analysis suggests that the proposed dark fibre remedy would almost always be more cost effective than an EBD 10 Gbit/s<sup>338</sup>, so there is no incentive to arbitrage at current EBD 10 Gbit/s prices. Even if BT were to alter its pricing structure the impact is likely to be very limited, as there is only a small volume of EBD circuits from BT Only exchanges.
- 12.51 Furthermore, EBD circuits currently account for [X]% of inter-exchange circuits from BT Only exchanges, of which 1 Gbit/s account for [X]%. The distance at which an EBD 1 Gbit/s circuit, based on the cheapest band, would be more cost effective compared to a dark fibre circuit is likely to be a number of times greater than the [X]km average EAD inter-exchange circuit. The long break-even distance means only a small proportion of 1 Gbit/s EBD inter-exchange circuits are likely to be affected. This is in addition to 1 Gbit/s EBD circuits making up a very small proportion of inter-exchange circuits from BT Only exchanges.

### Fault frequency, detection and repair

- 12.52 In general, the overall causes of faults in inter-exchange connectivity circuits will be similar whether they use active or dark fibre services as an input. However, where dark fibre

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<sup>338</sup> For Band A, Band B and Band C circuits.

allows a reduction in the total equipment used to deliver the service, there will be fewer points of failure and hence this should entail a lower frequency of faults. Dark fibre will therefore provide more reliable services and potentially reduce costs, through associated reductions in required repairs. For example, TalkTalk estimate a number of faults, [§<]%, of faults occur in the active layer.<sup>339</sup>

- 12.53 The fault detection and repair processes for dark fibre would differ from those for active services, because telecoms providers other than Openreach would be operating the network equipment that facilitates monitoring and fault diagnosis. However, we see no reason why providers should not be able to develop repair processes that perform at least as well with dark fibre as with Openreach wholesale active circuits. Repairs (except repairs to Openreach’s fibre) would also be within the purchasing provider’s control.
- 12.54 The concentration of remote monitoring and remote diagnoses with the purchasing provider could also reduce costs, by reducing the need for the provider to co-ordinate with Openreach if a fault does not relate to Openreach fibre.
- 12.55 In general, purchasers of dark fibre would have strong commercial incentives to manage faults effectively and coordinate with Openreach. Openreach previously published a final reference offer for dark fibre, which included a description of the fault repair process agreed with providers.
- 12.56 There may be a risk that providers could be incentivised to call out Openreach engineers when faults are detected, without first identifying whether or not the fault is with their own equipment. We think that Openreach can also incentivise providers to make efficient decisions on repair through an appropriate callout charge where a fault is incorrectly diagnosed, which is known as a Right When Tested (RWT) charge.
- 12.57 In summary, we would likely expect benefits from the proposed dark fibre remedy in the form of lower fault rates and potentially reduced costs associated with fault reduction and repair.

### Take-up of dark fibre in inter-exchange connectivity

- 12.58 The benefits of dark fibre will be proportional to the take-up of the remedy. We expect telecoms providers will use dark fibre over active products for inter-exchange connectivity where they are able to realise the benefits discussed above – cost savings and/or increased flexibility and control. Take-up will also vary depending on the relative price of alternative products. However, we recognise that dark fibre orders may take time to ramp up following launch, as providers seek to test their use of dark fibre and adopt a cautious approach until SLAs and SLGs are in place.
- 12.59 We also expect dark fibre take-up to vary based on the type of active product that would have been used absent a dark fibre remedy, and hence the available savings from the use of dark fibre. To assess this, we have considered data from Openreach’s circuit inventory on current active circuit rentals between exchanges within our proposed scope of the

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<sup>339</sup> [§<]

remedy. We have also considered evidence from providers in response to our 2017 Dark Fibre Consultation.

12.60 Table 12.2 below summarises the products sold for current active circuits by Openreach from BT Only exchanges and in inter-exchange connectivity in total.<sup>340</sup>

**Table 12.2: Breakdown of Openreach products across BT exchanges**

Product	Openreach inter-exchange circuits at BT Only exchanges		All Openreach inter-exchange circuits	
	Circuits	%	Circuits	%
100 Mbit/s and below	[Redacted]	[Redacted]%	[Redacted]	[Redacted]
1 Gbit/s EAD	[Redacted]	[Redacted]%	[Redacted]	[Redacted]
10 Gbit/s EAD	[Redacted]	[Redacted]%	[Redacted]	[Redacted]
1 Gbit/s EBD	[Redacted]	[Redacted]%	[Redacted]	[Redacted]
10 Gbit/s EBD	[Redacted]	[Redacted]%	[Redacted]	[Redacted]
OSA	[Redacted]	[Redacted]%	[Redacted]	[Redacted]
<b>Total</b>	[Redacted]		[Redacted]	

Source: Ofcom analysis of Openreach circuit inventory.<sup>341</sup>

12.61 For the three product types set out in the above table:

- Dark fibre provides clear cost savings over EAD active services due to our dark fibre pricing approach, which only includes costs associated with the connection between exchanges, and reduced equipment duplication. This is likely to hold even where providers incur additional costs due to non-domestic rates. The majority of current inter-exchange connectivity from BT Only exchanges use EAD services. We would expect a significant proportion of new and upgrading circuits that would have used EAD services to use dark fibre instead. Existing EAD active services would may also migrate to dark fibre over time when minimum contract terms expire;
- OSA circuits use WDM multiplexing equipment to deliver multiple circuits of high bandwidths. Providers using dark fibre instead of OSA may be more likely to have to add additional multiplexing equipment to their existing electronics to replicate the service provided by Openreach. This makes it less certain that a provider would use dark fibre instead of an OSA service purely on the basis of cost savings; and

<sup>340</sup> We note that in addition, in BT+1 and BT+2 exchanges, there are circuits sold by other providers which means that volumes in Table 12.2 only indicate a subset of circuits between BT exchanges or backhaul demand in general. As discussed in Section 6 and Annex 12, we have found serious issues with Virgin Media's inventory data that have rendered some of its data unreliable. Accordingly, we have not included other telecoms providers' circuits in this analysis.

<sup>341</sup> Ofcom analysis based on Question A to the 1st BCMR s.135 notice, dated 18 January 2018.

- EBD circuits provide a service over shared fibre infrastructure, which can involve multiple telecoms providers using the same physical fibre connection. EBD pricing is not on a per metre basis, though banding does apply based on location. Therefore, take-up of dark fibre in place of EBD will depend on the distance to be covered by the circuit. At current pricing, we expect dark fibre will be more cost effective than EBD in many instances. However, dark fibre may not be as good a substitute for long distance EBD circuits at current prices, particularly at 1 Gbit/s.
- 12.62 In response to our 2017 Dark Fibre Consultation, users indicated substantial demand for dark fibre for backhaul purposes, and potential for this need to expand as bandwidth demand grows. For example, Sky indicated that it would use an unconstrained dark fibre remedy in backhaul by replacing Ethernet circuits with dark fibre.<sup>342</sup> A further provider, [Redacted] indicated that they anticipated [Redacted]<sup>343</sup>. Another provider, [Redacted], noted it had [Redacted].<sup>344</sup>
- 12.63 Based on current active sales and responses to our 2017 Dark Fibre Consultation, there are incentives to purchase and use dark fibre for inter-exchange connectivity in a number of cases. We recognise that initial take up may take time to ramp up, and therefore the speed of take-up is uncertain. Nevertheless, we expect a material volume of dark fibre circuits to be purchased over this two-year review period.

## Summary of our assessment

- 12.64 We have set out the benefits of introducing dark fibre. The main benefits are:
- users would be able to choose their own electronic equipment, enabling them to deliver services that better suit their needs and the needs of their customers;
  - users would be able to make efficient decisions on bandwidth upgrades based on the underlying costs of upgrades;
  - users would be able to eliminate inefficient active equipment duplication resulting in lower costs to telecoms providers; and
  - users would potentially be able to deliver improvements more quickly than they can currently.
- 12.65 These benefits would allow providers to better compete on price, service quality and product offering in downstream markets. A dark fibre remedy in inter-exchange connectivity is likely to significantly reduce backhaul costs and is likely to be an important enabler for infrastructure build in marginal access areas.
- 12.66 We have also explained that the benefits are likely to be proportional to take-up of dark fibre. While we recognise that there is some uncertainty about the extent of take-up over the two-year review period, we think there are strong incentives for telecoms providers to use dark fibre for a substantial proportion of inter-exchange circuits where it is available.

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<sup>342</sup> Sky response to 2017 Dark Fibre Consultation.

<sup>343</sup> [Redacted]

<sup>344</sup> [Redacted]

- 12.67 We have also considered the potential risks associated with implementing a dark fibre remedy. We have explained that we do not think there is evidence to suggest that a flattening of the bandwidth gradient will have an adverse impact on economic efficiency. In fact, we think the remedy is likely to place downward pressure on the price of VHB circuits resulting in prices closer to cost, which would improve efficiency. We also consider that the benefits from reduced equipment duplication resulting from a dark fibre remedy cannot be achieved through regulation of active services.
- 12.68 We have considered whether the proposed dark fibre remedy would result in an under-recovery of costs for BT. The factors we have considered include whether our proposal results in stranded assets for BT or incentives for telecoms providers to arbitrage using dark fibre for relatively shorter connections and EBD for longer connections. We have assessed these issues and explained that we consider the risk to be very low.
- 12.69 We have explained that we would likely expect benefits from the proposed dark fibre remedy in the form of lower fault rates and potentially reduced costs associated with fault reduction and repair.
- 12.70 We recognise that there is a risk that a dark fibre remedy could deter competitors from connecting to BT exchanges to provide backhaul services and generally undermining the provision of backhaul and core connectivity services. We propose limiting dark fibre to routes from BT Only exchanges to ensure this risk is small (see “Scope of the remedy” sub-section below).
- 12.71 Overall, we consider there are considerable benefits that would arise from the introduction of dark fibre between exchanges that outweigh the risks that we have described above.

## **Our proposals for a dark fibre access remedy**

- 12.72 In this sub-section we set out the scope and design of the dark fibre access remedy. We propose introducing dark fibre for inter-exchange connectivity from BT Only exchanges. In setting out the proposed scope we have sought to respond to the competition concerns while recognising the potential impact on future investment in infrastructure.
- 12.73 We also consider the design of the dark fibre remedy below. This needs to be suitable for provision of access to dark fibre for inter-exchange connectivity and also designed in a way that fits our wider strategy as it develops throughout the two-year review period.
- 12.74 As we set out the proposals for access to dark fibre, this section deals with specific details affecting the adoption of this remedy. Our proposed general remedies, which are discussed in Section 11, are applicable to our requirement for access to dark fibre, including:
- requirement to provide network access, including any ancillary services reasonably necessary for third parties to make use of dark fibre;
  - no undue discrimination including EOI;
  - requirement for an RO;
  - new access requests;

- notification of technical changes;
- notification of changes to terms and conditions of access.

12.75 In relation to the RO for access to dark fibre, we propose a remedy design that enables the RO to build on previous iterations, in order that there is a smooth transition for take up of passive remedies. Below we explore specific minimum requirements for the RO in relation to the proposed dark fibre remedy for inter-exchange connectivity.

## Scope of the remedy

- 12.76 Dark fibre replicates many of the benefits for network operators of owning their own network. The more attractive it is to buy dark fibre, the less likely operators are to roll out their own network. This can include rolling out network using BT's ducts and pole infrastructure.
- 12.77 We place a lot of weight on the impact of our proposals on rival investment in line with our strategy to promote network-based competition. We have now published proposals for unrestricted access to BT's ducts and poles, which will make it cheaper and easier for competitors to build new networks. For now, we are taking a conservative approach and therefore consider dark fibre is currently only appropriate where material rival investment is very unlikely.
- 12.78 To determine the appropriate scope of our remedy, we have considered the potential for investment in backhaul in the different parts of the market where we propose that BT has SMP (i.e. routes from BT Only and BT+1 exchanges). We propose a dark fibre access remedy only at routes from BT Only exchanges.
- 12.79 Where the remedy only applies to routes from BT Only exchanges there would be no impact on existing investment undertaken by other Principal Core Operators (PCOs).
- 12.80 The proposed dark fibre remedy could have an impact on future investment by PCOs. It could dampen backhaul prices such that it deters rivals from investing in backhaul or core capability. The dark fibre remedy could deter PCOs from:
- connecting to a BT exchange to provide backhaul services; and/or
  - investing in competing routes to backhaul traffic.
- 12.81 In the following paragraphs we set out our analysis.

## Incentives to connect to an exchange

- 12.82 We consider that there are three key factors that influence a telecoms provider to connect to a BT exchange:
- the cost of connecting to an exchange – this is likely to be based on the distance a provider would need to extend its network to connect to a BT exchange. The longer this distance, the less likely that provider would connect to an exchange;
  - demand for backhaul – the higher the demand for backhaul at a given exchange the more incentive a telecoms provider has to connect to the exchange to provide

- backhaul services. The higher demand means that it is more likely to be able to win some business away from BT or the other PCOs present at the exchange; and
- the value of circuits – BT’s pricing according to a bandwidth gradient means that higher bandwidth circuits are priced higher compared to lower bandwidth services. This makes winning higher bandwidth contracts more lucrative because the cost of connecting to the exchange is the same regardless of the bandwidths supplied. Therefore, at exchanges where there is likely to be more demand for higher bandwidths the incentive to connect is likely to be higher.

### BT Only exchanges

- 12.83 BT Only exchanges are typically located in rural areas with low residential and business population density (see Figure 7.3). As described in Section 7, our analysis shows that the average distance a single rival network would need to extend is over 6km (median over 2.5km) and the average distance from an exchange to a second rival is over 12km (median 6km). These distances are very long, and it is highly unlikely to be economic to dig. We consider that even if there was a duct remedy in place at these distances it is unlikely to be economic to extend the network except in a very small minority of cases.
- 12.84 Demand for backhaul from BT Only exchanges is lower compared to BT+1 and BT+2 exchanges. For example, at BT Only exchanges Openreach supplies an average [REDACTED] circuits per exchange compared to [REDACTED] circuits per BT+1 exchange and [REDACTED] from BT+2 exchanges. These estimates also underestimate the demand for leased lines at BT+1 and BT+2 exchanges because they only account for circuits that Openreach supplies and not the supply by other PCOs present at the exchange.
- 12.85 Our analysis shows [REDACTED]% of circuits purchased from Openreach at BT+0 exchanges are 1 Gbit/s and below and [REDACTED]% are VHB circuits. In comparison, at BT+1 exchanges [REDACTED]% of circuits purchased from BT are 1 Gbit/s and below and [REDACTED]% are VHB circuits and at BT+2 exchanges [REDACTED]% and [REDACTED]% respectively. We also consider it likely that rivals at the BT+1 and BT+2 exchanges are likely to be supplying a higher proportion of VHB circuits because BT’s higher prices for VHB circuits mean there is more scope to undercut BT for VHB circuits.
- 12.86 There may be an increase in demand for backhaul circuits and higher bandwidths, in line with the general trend. However, we would expect this increase in demand to be lower than the demand at BT+1 and BT+2 exchanges. For example, from the majority of BT Only exchanges, only copper broadband is available (known as LLU exchanges). Superfast broadband (available from GEA handover exchanges) is only available at 10% of BT Only exchanges. Consumers are increasingly moving to superfast broadband. Sky forecasts, from 2018 to 2021, [REDACTED].<sup>345</sup>

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<sup>345</sup> [REDACTED]

### BT+1 exchanges

- 12.87 At BT+1 exchanges, by definition, one rival PCO is already connected. Our analysis shows that the average straight-line distance the nearest rival currently not connected to the exchange would need to extend its network to connect is over 1.5km, and the median is 318m. This shows rival network is available closer than BT Only exchanges. Extending network such distances is expensive and a significant barrier to entry. However, it is possible that as demand for backhaul and bandwidth increases some PCOs might connect to some exchanges over the medium to longer term, particularly given our proposals for unrestricted DPA.
- 12.88 At BT+1 exchanges there is greater demand for backhaul circuits compared to BT Only exchanges, though not as high as BT+2 exchanges. The evidence also shows greater demand for higher bandwidth products compared to BT Only exchanges and therefore the potential value of circuits may be higher (see above).
- 12.89 We consider that there is a higher risk at BT+1 exchanges that dark fibre could deter future rival investment. As noted in Section 10, we expect our proposed unrestricted DPA remedy to improve the economic viability of rivals extending their networks. Where such extensions may take place remains uncertain at this time, and we will review the mix of our remedies as investment plans materialise.

### Incentives to build competing routes

- 12.90 To provide wholesale backhaul services across a wide geography in the UK, rival network operators need to have a substantial network of infrastructure. Typically, telecoms providers plan and extend their backhaul networks as necessary. We consider whether a dark fibre remedy could dampen incentives for network operators to invest in backhaul routes. This would result in less dense backhaul networks and could have the impact of helping to entrench BT's market power in backhaul and core connectivity.
- 12.91 We consider that the drivers to extend backhaul infrastructure are likely to be similar to the factors that influence a decision to connect to an exchange, i.e. the cost of extending the network, the demand for backhaul from a specific area, and the value of circuits providers expect to be able to sell.

### BT Only exchanges

- 12.92 We consider the risk of deterring investment in routes which would compete with backhaul from BT Only exchanges is low, for the reasons similar to those explained above.
- 12.93 BT Only exchanges are often located in rural areas where there is limited demand for backhaul and are likely to be located in or close to areas where BT is the only supplier of access leased lines. Nearly 95% of BT Only exchanges are located in BT Only areas, as defined by our geographic market definition for access. If a PCO has limited or no network in the area it can be very costly to dig to extend the network. Additionally, as demand for backhaul is limited there are less likely to be incentives for a PCO to extend their network and compete with BT backhaul.

- 12.94 Two BT Only exchanges out of over 4,300 are located in BT+2 access areas, as defined by our geographic market definition for access (i.e. CLA, Metro Areas and other HNR areas).
- 12.95 There is greater risk that investment would be undermined at these more urban exchanges, as the availability of dark fibre at cost would mean the potential margin earned on these backhaul routes could be lower and might not be sufficient to justify the investment. However, the number of exchanges affected is extremely low such that the risk is minimal.

### **BT+1 exchanges**

- 12.96 As BT+1 exchanges are located in more urban areas it is possible that PCOs would have more incentive to provide backhaul services from these areas. A PCO may not need to significantly extend its network to develop backhaul routes. Demand for backhaul in these areas is likely to be higher with more demand for higher bandwidths. Therefore, the value of circuits will be higher. However, investment may be deterred because the availability of dark fibre at cost means the more intense price competition such that the potential margin earned on these backhaul routes is lower and may not be sufficient to justify the investment.

### **Proposal to limit the remedy to routes from BT Only exchanges**

- 12.97 In light of the above analysis, we propose to implement dark fibre only on routes from BT Only exchanges, where competition is most unlikely. Our strategy is to promote investment and competition in telecoms networks. We think there would be a potential risk of deterring rival network operators from connecting to BT+1 exchanges and developing their backhaul networks, especially following the introduction of our proposed unrestricted duct access remedy, if we introduced dark fibre at BT+1 exchanges.

### **Design of the dark fibre remedy**

- 12.98 As set out in Section 10, our proposed dark fibre access remedy for inter-exchange connectivity circuits forms part of a longer-term strategy for incentivising infrastructure development to aid competition across multiple markets. As we said in our Strategic Policy Position, in the future we will explore the case for requiring BT to provide dark fibre in other non-competitive areas of wholesale markets.<sup>346</sup>
- 12.99 Our proposed design is intended to allow for smooth adoption of dark fibre across this two-year review period and beyond. An appropriate starting point is the remedy design previously conceived for disaggregated access and backhaul segments, as set out in the 2016 BCMR and 2017 Dark Fibre Consultation.
- 12.100 In the 2016 BCMR<sup>347</sup> we decided that the technical, operational (provisioning and repair) and commercial aspects of BT's current offer of wholesale Ethernet services (in particular

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<sup>346</sup> Paragraph 4.24.

<sup>347</sup> See Section 9 paragraphs 9.34-9.36 and Annex 22, 2016 BCMR.

EAD and EAD Local Access) should be used as a benchmark for establishing the arrangements applicable to dark fibre. BT's EAD products provide a range of connectivity options which fulfil telecoms providers' access and backhaul requirements, and BT's processes for providing those active products should therefore be capable of adaptation to include the provision of dark fibre. We also acknowledged that the operation of BT's dark fibre products would differ from Ethernet products in some respects.

- 12.101 While the market for this remedy is distinct from those considered in the 2016 BCMR and during the 2017 Dark Fibre Consultation, we intend to take the same approach for the following reasons. BT's wholesale Ethernet products are the main products that BT currently supplies for a range of services spread across lower bandwidths and some VHB circuits. In view of our design objective for the dark fibre remedy, we therefore consider that they are also a suitable benchmark for a dark fibre product across multiple markets, including for provision of inter-exchange connectivity across all bandwidths.
- 12.102 Since the 2016 BCMR, BT has developed its dark fibre product modelled on its Ethernet products, in collaboration with telecoms providers and the Office of the Telecommunications Adjudicator (OTA2); however, this has not been implemented to date.
- 12.103 In the rest of this section we discuss the key design aspects of the dark fibre remedy we are proposing and explain where our proposals differ from the remedy we imposed in the 2016 BCMR. The non-price design aspects of the proposed dark fibre remedy are summarised in Table 12.3:

**Table 12.3: Summary of non-price design aspects of dark fibre**

Design aspect	Proposed approach
Circuit configurations	BT to provide dark fibre segments from BT Only exchanges.
Parity with active wholesale products	Dark fibre product should be comparable to the fibre elements of the corresponding active wholesale products (i.e. EAD100).
Arrangements concerning provision of new infrastructure	The same provisioning arrangements should apply for both the active and dark fibre remedies, and the existing charging arrangements for network extensions in relation to active services would provide the most suitable solution for dark fibre.
One or two fibre circuits	BT to provide one and two fibre circuits.
Provisioning, repair and service migration processes	The provisioning, repair and service migration processes which were developed by BT in collaboration with industry for the dark fibre remedy imposed in the 2016 BCMR should be suitable for the proposed dark fibre remedy. These are specified in BT's dark fibre RO. <sup>348</sup>

<sup>348</sup> BT's dark fibre Reference Offer (the dark fibre RO), see:

<https://www.openreach.co.uk/org/home/products/darkfibreaccess/darkfibreaccess.do> [accessed 30 October 2018].

Interconnection and accommodation services      The proposed interconnection and accommodation remedies for active wholesale products should also apply to dark fibre.

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## Circuit configurations

- 12.104 To ensure that purchasers of dark fibre are not at a competitive disadvantage to purchasers of active wholesale services, we consider that telecoms providers should be able to obtain dark fibre circuits in similar configurations to BT's current range of active services. To achieve this, we propose an obligation requiring BT to provide dark fibre segments for inter-exchange connectivity as set out in Section 7, including backhaul and core segments in between access aggregating nodes.<sup>349</sup>
- 12.105 This is intended to allow providers to develop networks involving dark fibre solutions for inter-exchange connectivity alongside wholesale access arrangements in new locations that may replicate network designs in areas which are already more competitive.

## Parity with active wholesale products

- 12.106 We propose that BT should be required to ensure that its dark fibre product is comparable to the optical elements of the corresponding wholesale active services: BT would be required to ensure that dark fibre circuits are provided in the same manner, using the same systems and processes and within the same or a shorter period of time, save in respect of objectively justifiable differences.

## Arrangements concerning provision of new infrastructure

- 12.107 We propose that the same arrangements concerning the provision of new infrastructure should apply for both the active and dark fibre remedies, and the existing charging arrangements for network extensions in relation to active services would provide the most suitable solution for dark fibre. We consider that this approach will effectively ensure consistency with active services.

## One or two fibre circuits

- 12.108 To ensure that purchasers of dark fibre are not at a competitive disadvantage to purchasers of active wholesale services, we consider that telecoms providers should be able to obtain dark fibre circuits in similar configurations to BT's current range of active services. On this basis, we propose to require BT to provide one or two fibre circuits.

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<sup>349</sup> Given our finding of SMP across relevant sites at which inter-exchange connectivity is facilitated, the dark fibre remedy is designed to address competition concerns in backhaul. Given the remedy is no longer restricted to lower bandwidths, we do not propose any distance limits because this safeguard built into previous dark fibre access designs is not applicable.

## Provisioning and repair processes

- 12.109 The provisioning, repair and service migration processes were developed by BT in collaboration with telecoms providers during the implementation process for the dark fibre remedy imposed in the 2016 BCMR. The processes were specified in BT's dark fibre Reference Offer.
- 12.110 The provisioning processes for the dark fibre product that BT has developed are the same as those of the corresponding active products in most respects. The main differences are that BT would not provide active equipment, and would undertake a precision test to measure circuit performance parameters.
- 12.111 The fault repair processes are necessarily different to the corresponding active products because telecoms providers, rather than BT, would be operating the network equipment which facilitates monitoring and fault diagnosis. Telecoms providers are therefore required to take greater responsibility for dispatch of BT technicians to repair fibre faults. BT has proposed to levy a Right When Tested (RWT) charge for abortive fault repair visits above a threshold judged to be consistent with efficient remote fault diagnosis.
- 12.112 We consider this approach to be sensible, although we are concerned that in the absence of price control regulation BT would have the ability and incentive to set excessive charges for RWT, which would potentially deter take-up of the proposed dark fibre remedy. We are proposing price controls for RWT in the form of charge controls on the per-visit charge. We set out the details of the proposed price control remedy, including the relevant legal tests, in Volume 2 of this consultation.

## Other ancillary services

- 12.113 As noted above, the proposed general network access requirement would also include any ancillary services as may be reasonably necessary for a third party to use the proposed dark fibre remedy. We consider that this requires BT to provide certain ancillary services that we consider are particularly important for ensuring take-up of the dark fibre remedy, as set out in the following paragraphs.
- 12.114 We consider that telecoms providers will require interconnection and accommodation services to use the dark fibre remedy effectively. As previously discussed, we expect the dark fibre and active wholesale products to be very similar. We also expect that dark fibre would be used for the same purposes as active wholesale products and in the same configurations. We therefore consider that the interconnection and accommodation remedies set out in Section 14 would also be suitable for dark fibre and propose that these obligations should also apply to dark fibre access.
- 12.115 We consider that BT should not charge for Excess Construction Charges (ECCs) as part of its provision of dark fibre services. As such, we do not propose to include the costs of ECCs in our estimates of the costs of the inter-exchange dark fibre connection service. This is because, for most inter-exchange dark fibre circuits, little (if any) extra construction work will be required as the infrastructure is already in place. Our detailed proposals and the supporting rationale are set out in Volume 2 of this consultation.

- 12.116 We consider that BT may impose Time Related Charges (TRCs) in relation to dark fibre services. We see no reason, with the exception of RWT<sup>350</sup>, that the prices charged for these services are not the same as charged for active TRCs. Therefore, we propose, that for all TRCs that are imposed in relation to dark fibre services, the charges should be the same as those imposed for active TRCs, with the exception of RWT.
- 12.117 In addition to RWT charges, there is one additional ancillary service which we consider third parties will need to make effective use of the proposed dark fibre remedy. This is a cessation charge, which is applied to customers who cease use of dark fibre prior to the end of a contract.
- 12.118 BT incurs costs when completing RWT and cessation activities, as both require engineering call-outs (unlike active circuits, dark fibre circuits cannot be ceased remotely). We think it is acceptable for BT to recover these costs through charges to their wholesale customers. As it is not clear how often these charges are likely to be incurred, we consider it is appropriate for BT to charge providers on a per-occasion basis rather than recover costs through rental and connection charges across all providers.
- 12.119 As noted above, we think that Openreach can incentivise providers, via the level of the RWT charge, to make efficient decisions on repair. However, our concerns in relation to excessive charges for RWT set out above also apply to excessive cessation charges.
- 12.120 To address this competition concern, we are proposing price controls for RWT and cessation in the form of charge controls on the per-visit charge for each. We set out the details of the proposed price control remedy, including the relevant legal tests, in Volume 2 of this consultation.

## Minimum requirements for Reference Offer

- 12.121 We propose that BT should be required to publish an RO for dark fibre on the same terms set out in the 2016 BCMR.<sup>351</sup> In particular, we propose that the RO for dark fibre must set out (as a minimum) such matters as:
- a clear description of the services on offer including technical characteristics and operational processes for service establishment, ordering and repair;
  - the locations of points of network access and the technical standards for network access;
  - conditions for access to ancillary and supplementary services associated with the network access including operational support systems and databases etc;
  - contractual terms and conditions, including dispute resolution and contract negotiation/renegotiation arrangements;
  - charges, terms and payment procedures; and

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<sup>350</sup> We note that the RWT service provided for active Ethernet circuits is different to that provided for dark fibre.

<sup>351</sup> 2016 BCMR, Volume 1, paragraphs 9.177 to 9.182.

- SLAs and SLGs to be agreed and finalised as part of industry negotiations regarding product specification and to enter into force three months after the launch of dark fibre.

12.122 We also propose that the RO for dark fibre must set out an explanation of any differences between the provision of dark fibre services and the same associated services that apply to the relevant reference product. This is intended to offer transparency within the RO and help achieve parity between dark fibre access and wholesale active services. Such transparency in the RO will also assist the monitoring of anti-competitive behaviour and provide visibility to the terms and conditions on which other providers will purchase dark fibre services.

## Implementation timeline

12.123 The proposed timeline for implementation, which includes setting out the RO, is discussed in Annex 17. The implementation obligations are as follows:

**Table 12.4: Summary of the proposed dark fibre remedy implementation obligations**

Obligation	Summary
<b>Reference Offer</b>	<ul style="list-style-type: none"> <li>• Specified minimum requirements for the RO;</li> <li>• SLAs and SLGs to be agreed and finalised as part of industry negotiations regarding product specification within the RO;</li> <li>• Publish an RO within one month of the date of the publication of the final Statement; and</li> <li>• SLAs and SLGs to enter into force three months after the launch of dark fibre.</li> </ul>
<b>Launch</b>	<ul style="list-style-type: none"> <li>• Launch dark fibre access within one month of the date of the publication of the final Statement.</li> </ul>
<b>Quality of service</b>	<ul style="list-style-type: none"> <li>• QoS standards apply from year two of the market review;</li> <li>• Key Performance Indicators (KPIs) defined in Direction; and</li> <li>• Reporting requirements to come into effect immediately from launch (i.e. within one month of the date of the publication of the final Statement).</li> </ul>

12.124 While the RO will need to agree relevant SLAs and SLGs within one month, it is expected that some further time will be needed to adopt them in practice. The SLAs and SLGs can come into force at a later date, separate to the publication of the RO, and we propose that this should not be more than three months after launch. We also propose to impose QoS standards on these inter-exchange dark fibre circuits in year two of the market review, including them alongside the other Ethernet products covered by the QoS standards (see Section 15).

## Proposed approach to pricing of access to dark fibre

### Aims and effect of regulation

- 12.125 A price control condition is aimed at addressing BT's ability and incentive to charge excessive prices or otherwise engage in a price squeeze. Other remedies, such as a prohibition on undue discrimination, may also be used to restrict elements of pricing conduct.
- 12.126 In a competitive market, charges would be set on the basis of the commercial judgements of individual companies and could be expected to deliver cost reflective prices. However, where a provider has SMP, competition cannot be expected to provide effective constraints and *ex ante* regulation may be necessary to prevent charges from being set at an excessive level. Such intervention could also have as its objectives the aims of promoting efficiency and of allowing the development of effective competition in downstream markets.
- 12.127 For inter-exchange circuits between relevant sites, BT has SMP and has an incentive and the ability to charge excessive prices. Excessive prices at the wholesale level could make it difficult for other providers to compete at the retail level with BT and may result in market exit. Excessively high wholesale charges are also likely to result in high retail prices, i.e. consumers would be paying more for a service than they should expect if wholesale prices were constrained by effective competition.

### Our proposals

- 12.128 In this section we set out our proposed approach to setting a charge control for the proposed inter-exchange dark fibre remedy.
- 12.129 In principle, we could adopt either a cost-based or active-minus approach when setting a charge control. By cost-based we mean a charge control that is set with reference to the underlying costs of providing an inter-exchange dark fibre circuit. By active-minus we mean a charge control that is set with reference to the price of an active circuit, adjusted to reflect differences in the cost of providing an inter-exchange dark fibre circuit.
- 12.130 We propose to set a cost-based charge control for the proposed inter-exchange dark fibre remedy as we consider that its price should reflect its underlying costs. As the dark fibre remedy will only be available in areas where there is no existing competition and the likelihood of additional competition is low, we consider that a price premium to incentivise rival investment would be inappropriate.
- 12.131 Additionally, we have considered whether setting a price based on an active-minus approach would be appropriate to help preserve a bandwidth gradient. However, as set out above our evidence does not suggest high prices for VHB services are necessary for BT to recover its costs nor would a flattening of the bandwidth gradient have an adverse impact on economic efficiency.

- 12.132 Further, Ofcom’s regulatory strategy as set out in the Strategic Policy Position is moving away from price controls on active products in the longer term, meaning any active-minus approach would derive pricing arrangements only designed for the short term. Adopting a cost-based approach allows the possibility for price regulation on active services to be reduced or withdrawn in the future.
- 12.133 We therefore consider a cost-based charge control with reference to the relevant components of BT’s underlying passive infrastructure necessary for connections between exchanges would be more appropriate. This would include the relevant forward-looking incremental costs incurred by BT in providing inter-exchange dark fibre services, plus some mark-up to allow for the recovery of common costs.<sup>352</sup> Our detailed proposals for setting the charge control on dark fibre, including choice of cost standard, estimation of relevant costs, pricing of ancillary services, and satisfaction of the applicable legal tests, will be discussed in detail in Volume 2 of this consultation.

## Legal tests

- 12.134 For the reasons below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 12.135 In light of our proposed design of the dark fibre remedy and the assessment of the risks and benefits presented in this section, we have provisionally concluded that it would be appropriate to impose an SMP condition pursuant to section 87(3) of the Act, requiring BT to provide dark fibre access for inter-exchange connectivity to or from BT exchanges where BT is the only provider.
- 12.136 Section 87(3) of the Act authorises Ofcom to set SMP services conditions requiring the dominant provider to provide such network access as Ofcom may from time to time direct. These conditions may, pursuant to Section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to and for securing that the obligations in the conditions are complied with within periods and at times required by or under the conditions. Section 87(9) of the Act also authorises SMP services conditions imposing on the dominant provider such price controls as Ofcom may direct in relation to matters connected with the provision of network access, subject to the conditions of Section 88 being satisfied.
- 12.137 In proposing these conditions, we have taken into account the factors set out in Section 87(4) of the Act, which are:
- the technical and economic viability (including the viability of other network access products, whether provided by the dominant provider or another person), having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;
  - the feasibility of the provision of the proposed network access;

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<sup>352</sup> Common costs are those which arise from the provision of a group of services, but which are not incremental to the provision of any individual service.

- the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made);
- the need to secure effective competition (including, where it appears to Ofcom to be appropriate, economically efficient infrastructure-based competition) in the long term;
- any rights to intellectual property that are relevant to the proposal; and
- the desirability of securing that electronic communications services are provided that are available throughout the Member States.

12.138 We consider that the proposed conditions meet our duties under Sections 3 and 4 of the Act and the Community requirements under Section 4 of the Act. The obligations would promote efficient and sustainable competition in the provision of electronic communications networks and services by ensuring that BT offers wholesale products to enable telecoms providers to compete effectively with BT in downstream markets.

12.139 The proposed conditions are in accordance with Section 47(2) as they are:

- objectively justifiable, in that they facilitate and encourage access to BT's network and therefore promote competition to the benefit of consumers;
- not unduly discriminatory, as they are only for BT and no other telecoms provider has been found to hold a position of SMP in these markets;
- proportionate, since they are targeted at addressing the market power that we propose BT holds in the relevant part of BCM and do not require it to provide access if it is not technically feasible or reasonable; and
- transparent in that the conditions are clear in their intention to ensure that BT provides access to its networks to facilitate effective competition.

12.140 We have taken utmost account of the BEREC Common Position in preparing our proposals. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

12.141 For the reasons set out above, we are satisfied that the proposals to include dark fibre in the network access condition and associated SMP conditions meet the relevant tests set out in the Act.

## Consultation questions

Question 12.1: Do you agree with the aims and effect of our proposed dark fibre remedy? Please provide evidence to support your views.

Question 12.2: Do you agree with our proposed scope of the remedy? Please provide evidence to support your views. Please provide evidence to support your views.

Question 12.3: What scope do you expect to have for cost savings as a result of the proposed dark fibre remedy? How large do you expect any cost savings to be? Please provide evidence to support your views.

Question 12.4: How many orders for dark fibre would you envisage placing during the two year review period? Please provide evidence to support your views.

Question 12.5: Do you agree with our proposed timeline for dark fibre implementation? Please provide evidence to support your views.

## 13. Specific remedies for network access

- 13.1 This section outlines our proposed specific network access remedies for the markets in which we have provisionally identified BT as having SMP, which are:
- CI Access services at all bandwidths in the UK<sup>353</sup>, excluding the Central London Area (CLA) and the Hull Area, which we discuss in Section 6; and
  - CI Inter-exchange circuits at all bandwidths at non-competitive BT exchanges, which we discuss in Section 7.
- 13.2 In addition to the general network access obligation proposed in Section 11, we are proposing to require BT to provide network access to certain specific active products, including such associated facilities as are reasonably necessary for the provision of network access, in the CI Inter-exchange services market, and in the CI Access services market in BT Only, BT+1, and High Network Reach (HNR) areas, excluding the CLA and Hull Area.
- 13.3 By active products, we mean products that include the provision of electronic transmission equipment for the conveyance of the signals in addition to the underlying passive infrastructure and dark fibre. The active remedies we propose (including price controls) are designed to address the competition concerns we have provisionally identified in the business connectivity markets, as set out in Section 10, which include excessive pricing and margin squeeze.
- 13.4 Passive remedies are upstream of active remedies in the value chain and provide physical access to the passive non-electronic elements of the network infrastructure, but not the active electronics. As noted in Section 10, we are targeting our regulation upstream to passive network infrastructure. However, we expect the passive remedies proposed to take longer than the review period of the this BCMR to have a significant effect on competition. Also, BT, telecoms providers and end-users of leased lines will need time to adjust to any changes brought about by our proposed introduction of a dark fibre access remedy for certain inter-exchange connectivity circuits, including developing products, operating processes and systems, and migrating end-users' services from current products. Therefore, we are proposing to retain some active remedies to ensure consumers are protected in this period of transition.

### Summary of proposals

- 13.5 For all bandwidths in the CI Access and CI Inter-exchange markets where we propose to find BT to have SMP, we propose:
- a requirement to supply specific types of Ethernet services, including such associated facilities as are reasonably necessary for the provision of such services.

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<sup>353</sup> In Section 5 we provisionally defined a number of geographic markets for CI Access services. In Section 6 we provisionally found BT to have SMP in the following: Birmingham; Bristol; Edinburgh; Glasgow; Leeds; Manchester; all other HNR areas; BT+1 areas; and BT Only areas.

- for Very High Bandwidth (VHB) services, this also includes WDM services, including such associated facilities as are reasonably necessary for the provision of such services; and
  - a price cap at current prices for services at 1 Gbit/s and below for pricing stability, and a safeguard cap for VHB services.
- 13.6 While we propose specific access obligations in all markets in which BT has SMP, we propose to take a different approach to pricing in certain areas. In all areas other than HNR areas of the CI Access market, we will be proposing charge controls in respect of the specific network access remedies. We do not propose a charge control in HNR areas, as we consider that competition is emerging in these areas. Our proposed price control for HNR areas of the CI Access market (outside the CLA and Hull Area) is a fair and reasonable charging obligation, which is covered in Section 11.
- 13.7 In relation to CI Access circuits in postcode sectors in BT Only and BT+1, and CI Inter-exchange circuits at non-competitive BT exchanges, where we are proposing to require BT to offer the active service in question, we are also proposing appropriate quality of service standards and KPI requirements. These are explained in Section 15.
- 13.8 The Hull Area is considered separately in Section 16.
- 13.9 For each proposed remedy, we set out below:
- current regulation;
  - aim and effect of proposed regulation;
  - our proposals; and
  - legal tests for adoption of the regulation.

## Requirement to provide specific network access at all bandwidths

### Current regulation

- 13.10 BT is currently required to provide disaggregated wholesale Ethernet services at 1 Gbit/s and below in the access segment and the backhaul segment. It is also required to provide short range end-to-end wholesale Ethernet services<sup>354</sup> at 1 Gbit/s and below. BT is currently not required to provide WDM services. VHB services are currently unregulated.

### Aim and effect of proposed regulation

- 13.11 The proposed specific access obligation is intended as a complementary remedy to the proposed general access obligations and (where applicable) the dark fibre access remedy.
- 13.12 The specific access obligation requires BT to provide network access in the form of specific types of wholesale circuits. In the absence of this obligation, BT would have an incentive to withdraw or to no longer provide these products, around which telecoms providers have

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<sup>354</sup> These are circuits connecting end-user premises with another end-user premises.

developed their business models in some cases. This would be disruptive to telecoms providers and would reduce competition.

- 13.13 Additionally, the obligation is aimed at facilitating competition in the downstream retail markets for which CI services are an important input. In the absence of *ex ante* regulation, BT would have the incentive and ability to refuse to provide access on terms that would secure efficient investment and innovation, both in the relevant wholesale markets and the related downstream retail markets.
- 13.14 In the inter-exchange connectivity market, the remedy also aims to facilitate competition in inter-exchange connectivity and, alongside the proposed dark fibre remedy, would remove or reduce barriers to network expansion and promote competition in areas where competition is insufficient.

## Our proposals

- 13.15 We are proposing an SMP condition requiring BT to provide network access to the following specific active products in both the CI Access services market and the CI Inter-exchange connectivity market wherever we find that BT has SMP:
- Ethernet circuits at 1 Gbit/s and below; and
  - Ethernet and WDM circuits at bandwidths over 1 Gbit/s.
- 13.16 As we have set out in Section 4, we propose to include WDM in the same product market as Ethernet services (i.e. the market for CI services at all bandwidths). WDM services are particularly suited to providing VHB services, and can be used with a number of CI interfaces, not only Ethernet. The alternative to using WDM circuits over a single fibre would be to purchase multiple Ethernet circuits which is likely to be less efficient and result in higher prices. In addition, customers would be constrained in their choice of interface by being restricted to Ethernet only. For these reasons, we consider it necessary to require the provision of access to WDM connectivity for VHB services.
- 13.17 CI Access services are important for the provision of end-to-end network connectivity to customers. As we set out above in Section 6, BT's SMP in CI Access, combined with its ubiquitous network in the UK, gives BT a significant cost advantage over other operators as it will more often have a physical infrastructure connection (i.e. fibre or duct) to customer sites, which makes it cheaper for BT to extend its network to connect new customers. Telecoms providers need access to CI Access to be able to provide competitive constraints on BT's market power.
- 13.18 As our market analysis sets out in Section 7, CI Inter-exchange circuits are important to the business connectivity markets for connecting between network access points, and as an enabler of competition in the CI Access services market. BT's wholesale products have handover points at BT exchanges and to use these network access remedies, telecoms providers need cost-effective backhaul.
- 13.19 As we have set out above, in particular in Sections 10 and 12, we are proposing to require BT to offer dark fibre for CI Inter-exchange circuits from BT Only exchanges. This remedy will apply alongside the condition to offer active products. We consider that it is necessary

to have both active remedies and dark fibre from BT Only exchanges because it will take time for dark fibre to develop into a proven constraint on BT's market power. Active remedies will also ensure a smooth transition to our forthcoming proposals in relation to unrestricted duct and pole access.

- 13.20 As we explained in Section 11, pursuant to Section 151 of the Act network access is defined to include interconnection services and/or any services or facilities that would enable a person to make use of electronic communications services or networks. Therefore, the requirement to provide specific active products includes any ancillary services as may be reasonably necessary for a third party to use the active products specified in this section.
- 13.21 Time Related Charges (TRCs) are fees imposed for services such as fault repair and providing or rearranging services where the work is not covered by Openreach's standard charges.<sup>355</sup> Excess Construction Charges (ECCs) are imposed to recover the costs of customer-specific network construction work in association with a new connection. We consider that these services are reasonably necessary for a third party to use the active products specified in this section. We therefore consider that these services should be provided pursuant to BT's obligation to provide network access.
- 13.22 In the 2016 BCMR, we assessed which Ethernet TRCs were contestable (i.e. they could be undertaken by any telecoms provider's staff or other third party suppliers) and which were not (i.e. they could only be undertaken by Openreach staff). Given the differences between provisioning and repair TRCs activities, we considered the contestability of these separately.
- 13.23 We considered that the majority of Ethernet TRCs related to activities on Openreach network or equipment that could only be undertaken by Openreach staff and were therefore not contestable i.e. it was necessary for Openreach to provide these TRCs. We considered that even activities not relating to Openreach's network or equipment might not be contestable if there were practical or economic constraints that prevented telecoms providers using their own staff or other suppliers. For example, in the case of fault repair, limitations in diagnostic test functionality might mean that telecoms providers would be unable to determine in advance whether an activity relating to Openreach's network or equipment was likely to be required.
- 13.24 On the basis of our analysis, we concluded that all provisioning TRCs were not contestable but EAD repair TRCs relating to RWT and Customer equipment were contestable. Our detailed rationale and conclusions are set out in paragraphs 8.296-8.319 of the 2016 BCMR.
- 13.25 Our view has not changed and we therefore propose that:
- provisioning TRCs are not contestable and should be subject to the TRC charge control;

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<sup>355</sup> Openreach, Price list, Time Related Charges (Including Shifts), <https://www.openreach.co.uk/org/home/products/pricing/loadProductPriceDetails.do?data=hcaYjIWegP2u2KS8FTdcOBS cuIM1Opem5f8dVePnh8UIMnGHsqdC0vzO163bJmh34D91D7M0q8u%2F%0AIIsgtIFAKw%3D%3D> [accessed 30 October 2018] (TRC Price List).

- EAD repair TRCs relating to RWT and Customer Equipment are contestable, fall outside our network access obligation, and therefore should not be subject to the charge control; and
  - all other Ethernet repair TRCs are not contestable and should be subject to the charge control.
- 13.26 We discuss the price controls we propose to apply to non-contestable TRCs in Volume 2 of this consultation.
- 13.27 We propose to apply price controls to Direct ECCs.<sup>356</sup> We discuss the price controls we propose to apply to direct ECCs in Volume 2 of this consultation.
- 13.28 As discussed in Section 11, we propose to apply a no undue discrimination obligation on BT for the provision of network access and any ancillaries. We propose to apply a basis of charges obligation on BT for contractor ECCs. Our detailed proposals on charges are outlined in Volume 2 of this consultation. We are not aware of any factor that would make BT's ECCs costs higher or lower than its competitors'. We further note that there may be an incentive on BT to inflate the costs of BT's competitors and lower the cost of BT downstream ECCs. We would consider BT to have acted in an unduly discriminatory way if evidence were to be provided of this behaviour.
- 13.29 In Section 14, we outline our proposals for additional remedies for interconnection and accommodation services. We discuss the price controls we propose to apply to interconnection and accommodation in Volume 2 of this consultation.

## Legal tests

- 13.30 For the reasons we have set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 13.31 Section 87(3) of the Act authorises Ofcom to set SMP services conditions requiring the dominant provider to provide such network access as Ofcom may from time to time direct. These conditions may, pursuant to Section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to and for securing that the obligations in the conditions are complied with within periods and at times required by or under the conditions. Section 87(9) of the Act also authorises SMP services conditions imposing on the dominant provider such rules as they may make in relation to matters connected with the provision of network access about the recovery of cost and cost orientation, subject to the conditions of Section 88 being satisfied.
- 13.32 In proposing this condition, we have taken into account the factors set out in Section 87(4) of the Act, in particular the technical and economic viability of those services and the feasibility of their provision. We consider that this obligation will contribute to ensuring effective competition in the long term.

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<sup>356</sup> Direct ECCs refer to activities that are carried out by Openreach (i.e. using internal direct labour and materials).

- 13.33 We have also considered our duties under Section 3 and the Community requirements set out in Section 4 of the Act. In particular, the obligation is aimed at encouraging network access, and thereby promoting and securing efficient and sustainable competition, and the maximum benefit of customers of telecoms providers. It will continue to enable telecoms providers to compete effectively with BT in downstream markets.
- 13.34 We consider that the proposed obligation also satisfies the criteria set out in Section 47(2) of the Act because it is:
- objectively justifiable, in that it relates to the need to ensure that competition is maintained to the benefit of consumers;
  - not unduly discriminatory, in that the obligation aims to address BT's market power in the relevant markets, in which we provisionally consider that only BT has SMP;
  - proportionate, in that the obligation is necessary, to promote efficient and sustainable competition for the maximum benefit of customers of telecoms providers; and
  - transparent, in that the obligation is clear in its intention to require BT to provide network access to certain Ethernet and WDM services to other telecoms providers and its intended operation should also be aided by our explanations in this consultation.
- 13.35 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

## The BEREC Common Position

- 13.36 We have also taken utmost account of the BEREC Common Position in formulating our proposals, including BP1 to BP3a which appear to us to be particularly relevant in this context. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## Charge control

### Current regulation

- 13.37 BT is currently required to provide Ethernet services (as discussed above) at 1 Gbit/s and below outside of the CLA and the central business districts of Birmingham, Glasgow and Leeds, and is subject to a charge control on those services.<sup>357</sup>

### Aim and effect of proposed regulation

- 13.38 In the markets where we propose BT has SMP, in the absence of price regulation, BT has the incentive and ability to charge excessive prices. Excessively high prices at the wholesale level could make it difficult for telecoms providers to compete with BT at the retail level and they may in the long term exit the market. Furthermore, excessively high prices are

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<sup>357</sup> As we have set out in Section 2, in the 2016 BCMR we identified the central business districts in Birmingham, Bristol, Glasgow, Leeds, and Manchester as a separate geographic market. In Section 4, we set out our approach to geographic market definition in this consultation.

also likely to result in high retail prices. Therefore, we consider it necessary to propose a charge control to apply to the relevant active products.

- 13.39 We are consulting on proposals for unrestricted access to BT's ducts and poles and we have indicated our intention to review business and residential markets holistically in 2021.
- 13.40 Given these points and the short duration of this review, for services of 1 Gbit/s and below which are currently subject to a charge control, we have given greater weight to price stability and regulatory certainty than to the static benefits of keeping prices tightly aligned to costs.
- 13.41 For VHB services, we note that BT currently earns higher margins than services at lower bandwidths. However, our proposal for unrestricted DPA is likely to reduce this, particularly in areas where rivals may build. Our main concern in relation to the pricing of VHB services is that BT would increase prices in areas with limited or no competition to subsidise price reductions in more competitive areas (or where it considers rivals may build).

## Our proposals

- 13.42 We are proposing to address these concerns by imposing price controls on the active services for which there is a specific network access remedy. A price control can take a variety of forms including a charge control, basis of charges obligation, and fair and reasonable charging obligation. In selecting the appropriate form of price controls, we seek to balance a number of regulatory objectives. These include, among other things:
- preventing BT from setting excessive charges for the wholesale active services that are widely used today by telecoms providers;
  - promoting efficient and sustainable competition in the delivery of leased line services, including infrastructure competition through the adoption of passive remedies in line with Ofcom's wider strategy; and
  - encouraging investment and innovation.
- 13.43 As we have set out in this review, in particular in Section 10, given that this is a transitional review before we adopt a network-focused approach, and given that the potential for and timing of the take-up of passive remedies is uncertain, we consider that price stability and regulatory certainty are important to support our regulatory objectives.
- 13.44 We consider that it is necessary to impose a charge control to keep prices flat throughout the review period. We propose that the charge control applies to all relevant products at all bandwidths (except in the HNR areas of the CI Access market as discussed above). Without a charge control, it is our view that incentives to invest might be undermined which may make market entry less likely, or that BT may mitigate the effects of price reductions in prospectively competitive areas by raising prices in less competitive areas.
- 13.45 Our proposed approach promotes efficient investment by both BT and other telecoms providers, and benefits consumers by encouraging cost savings which feed through to lower future prices.

- 13.46 In reaching this proposal, we have balanced our objectives of preventing excessive pricing, promoting efficient and sustainable competition and encouraging investment and innovation.

### Legal tests

- 13.47 In relation to the proposed fair and reasonable charging requirement in relation to the HNR areas of the CI Access market where we are proposing to find that BT has SMP, we have set out in Section 11 why we consider this remedy satisfies the relevant legal tests.
- 13.48 In relation to the form of charge control proposed in this section, the detailed form of the charge control, along with the relevant legal tests, is set out in Volume 2.

### Classification of circuits that cross boundaries between CI markets

- 13.49 In the 2016 BCMR, we set out guidance on the classification of circuits which cross the CLA and London Periphery boundaries. In light of our proposal to define revised geographic markets for CI Access and CI Inter-exchange services, we now propose to update that guidance.
- 13.50 We propose that wholesale CI Access services (e.g. access circuits between two end-user sites or between an end-user site and a network aggregating node) should be classified as follows:
- inside the CLA only if both ends are in the CLA;
  - inside Metro or HNR areas if both ends are inside Metro or other HNR areas, or if one end is inside Metro or other HNR areas and the other end is in the CLA; and
  - inside BT Only or BT+1 areas if one or both ends are inside BT Only or BT+1 areas;
- 13.51 For CI Inter-exchange services, as we noted in Chapter 7, if both ends are at exchanges where two or more Principal Core Operators are present, then we consider these routes to be competitive. All other routes between BT exchanges are not competitive. Our proposed dark fibre remedy applies to subset of these non-competitive routes, i.e. when one or both ends terminate at a BT Only exchange.

### Consultation question

Question 13.1: Do you agree with the specific network access remedies that we propose for CI services at all bandwidths in the business connectivity markets? Please provide evidence to support your views.

## 14. Specific remedies for interconnection and accommodation

- 14.1 Telecoms providers require certain ancillary services from BT to use the wholesale leased line services that BT is required to provide in wholesale leased lines markets.
- 14.2 As a result of BT's SMP in the relevant wholesale markets, we consider it necessary to regulate to the provision of these ancillary services.
- 14.3 In Section 11 we set out our general remedies for the markets for CI Access services at all bandwidths and CI Inter-exchange circuits at all bandwidths and explained that these remedies would also apply to the interconnection and accommodation services that BT is obligated to provide in connection with wholesale services. Consequently, BT would be required to meet reasonable requests for interconnection and accommodation services under the general network access obligation that we are imposing for each of these markets.
- 14.4 In this section, we set out our proposals for the regulation of interconnection and accommodation services. We consider that interconnection and accommodation are needed to allow telecoms providers to interconnect their services with Openreach.
- 14.5 We are also proposing price controls for some ancillary services, which are discussed in Volume 2 of this consultation.
- 14.6 As outlined in Section 8, we have proposed that *ex ante* regulation is no longer justified for low bandwidth TI services. We therefore propose to amend our definition of "Interconnection Services" in our legal instrument to remove references to forms of interconnection which are specific to TI services, namely In-Span Handover and In-Span Handover extension.

### Interconnection

#### Current regulation

- 14.7 Interconnection services are provided at a point of connection (POC) or point of handover (POH). These are the points at which a telecoms provider's network interconnects with Openreach's network.
- 14.8 BT is currently required to provide the following interconnection services in the wholesale lower bandwidth CISBO market in the London Periphery (LP), CBD of Bristol, CBD of Manchester and the Rest of the UK (RoUK):
- CSH (customer sited handover), which involves Openreach providing a POC at the site of the interconnecting telecoms provider (requiring Openreach to extend its network). There are two types of CSH: with aggregation and without aggregation. In the former, Openreach supplies Bulk Transport Link (BTL), which aggregates multiple EBD services

for delivery over a single interconnection link to the telecoms provider’s site.<sup>358</sup> In the latter, Openreach terminates individual circuits at the telecoms provider’s site without aggregation. This method is commonly used for EAD circuits; and

- IBH (in building handover), which is where Openreach provides a POC at co-location space rented by a telecoms provider in a BT exchange. This connection is without aggregation.

14.9 We also decided that BT should continue to be subject to an obligation to meet reasonable requests for new forms of network access including interconnection services. Our detailed decisions on charge controls for interconnection services were set out in the Temporary Conditions.<sup>359</sup>

### Aim and effect of the remedy

14.10 We consider it necessary to require BT to provide certain interconnection services, and to apply price controls with respect to these services.

14.11 In the absence of this regulation, BT would have an incentive not to supply some or all of these interconnection services or to charge excessive prices. This is particularly the case, as it does not require these services to provide its own downstream retail services. As telecoms providers must purchase interconnection services to use Openreach regulated products, this would have the same effect as refusal to supply or excessive pricing for the main wholesale products that Openreach provides.

14.12 We have established specific requirements for different types of interconnection to facilitate different forms of competition. CSH facilitates new market entry by allowing telecoms providers to interconnect without having to incur the significant costs of extending their networks to BT exchanges. IBH facilitates the use of disaggregated access services and facilitates competition by allowing telecoms providers with a POP within a BT exchange to expand the range of services that they provide, potentially benefiting from economies of scale and scope by providing business connectivity services, in addition to Local Loop Unbundling (LLU) based broadband and telephony services.

### Our proposals

14.13 We propose to require BT to provide interconnection services in the relevant wholesale markets and to apply price controls to those services.

14.14 In the wholesale markets for CI Access services at all bandwidths in the UK excluding the Central London Area and the Hull Area, and at the CI Inter-exchange circuits at all bandwidths at non-competitive BT exchanges, we propose to require BT to provide:

- Customer sited handover (CSH); and
- In building handover (IBH).

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<sup>358</sup> We note that the use of BTL has significantly declined over the last review and [Redacted].

<sup>359</sup> Temporary Conditions, page 53.

- 14.15 For each of the markets above, we are also proposing that BT will continue to be subject to an obligation to meet reasonable requests for new forms of network access including interconnection services.
- 14.16 As explained in Section 12, we consider that telecoms providers will require interconnection services to make use of the dark fibre remedy that we are proposing to apply in the Inter-exchange connectivity market. We therefore propose that the interconnection and accommodation remedies set out in this Section should also apply to dark fibre.
- 14.17 We set out our approach to regulating the prices of interconnection services in Volume 2, of this consultation.

## Accommodation

### Current regulation

- 14.18 Openreach provides two types of regulated accommodation services: Co-mingling and Access Locate. Co-mingling is exclusively provided in support of LLU, while Access Locate provides accommodation for the majority of other access services supplied by Openreach, including Ethernet leased lines.
- 14.19 Openreach also provides a tie cable product in support of accommodation services called Cablelink. Cablelink has both internal and external variants. The internal variant allows a telecoms provider to connect two remote licensed areas of the BT exchange building (i.e. two separate areas in which the telecoms provider has installed its equipment). The external variant allows a telecoms provider's external fibre cable located immediately outside a BT exchange to be connected to a telecoms provider's equipment inside the exchange.
- 14.20 Cablelink is not a handover product as such as it is a passive product that does not interconnect Openreach equipment to the telecoms provider's equipment for the purposes of carrying traffic. However, we consider that it is an essential element of the accommodation services that Openreach provides given that it allows a telecoms provider to connect to different points of presence within a BT exchange as well as connect its presence within a BT exchange to a non-Openreach telecom's provider's fibre<sup>360</sup> outside the exchange.
- 14.21 BT is currently required to provide a number of accommodation services in the wholesale lower bandwidth CISBO market in the LP, CBD of Bristol, CBD of Manchester, and in the RoUK. For each of these markets, BT is currently subject to an obligation to allocate

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<sup>360</sup> Sometimes this fibre will be owned by the telecoms provider buying the External Cablelink. However, sometimes the fibre will be owned by another telecoms provider.

accommodation space on the basis of EOI and to price controls for accommodation services including Cablelink.

- 14.22 Our detailed decisions on charge controls for accommodation services were set out in the Temporary Conditions.<sup>361</sup>

## Introduction to the remedy, its aim and effect

- 14.23 We consider it necessary to require BT to provide accommodation services and apply price controls.
- 14.24 Accommodation in BT exchanges is an important enabler of competition in leased lines markets. It allows telecoms providers to make use of products such as EAD or EAD Local Access and facilitates competition in other markets.
- 14.25 Space and power in BT's exchanges can be limited, and in the absence of regulation BT would have the incentive and ability to discriminate in favour of its own needs in allocating such space and power. We further note that BT could choose not to supply some or all of these services or charge excessive prices. As telecoms providers must purchase these services to use regulated products, this would have the same effect as refusal to supply, or excessive pricing for, the main wholesale products. The absence of requirements in relation to accommodation services could thus undermine the effectiveness of other remedies in the relevant markets.

## Our proposals

- 14.26 We propose to require BT to provide accommodation services in the relevant wholesale markets and also to apply price controls to those services.
- 14.27 We propose to require BT to provide accommodation services in the relevant wholesale markets:
- CI Access services at all bandwidths in the UK excluding the Central London Area and the Hull Area; and
  - CI Inter-exchange circuits at all bandwidths at non-competitive BT exchanges.
- 14.28 For each of the markets above, we propose that BT should be subject to an obligation to allocate accommodation space and power on the basis of EOI and to impose price controls for accommodation services including Cablelink. We also continue to consider, given the importance of accommodation, that for these markets it is essential that space and power continue to be allocated on a first come first served (FCFS) basis.
- 14.29 As explained in Section 12, we consider that telecoms providers will require accommodation services to make use of the dark fibre remedy that we are proposing to apply in the inter-exchange connectivity market. We therefore are proposing to apply obligations on BT to provide accommodation services to dark fibre in these markets.

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<sup>361</sup> Temporary Conditions, page 54.

14.30 We set out our approach to regulating the prices of accommodation services in Volume 2, of this consultation.

## Legal tests

14.31 For the reasons we have set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.

14.32 Section 87(3) of the Act authorises the setting of SMP conditions requiring the dominant provider to provide such network access as Ofcom may, from time to time, direct. These conditions may, pursuant to Section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to and for securing that the obligations in the conditions are complied with within periods and at times required by or under the conditions.

14.33 Section 87(3) includes reference to conditions requiring relevant facilities to be made available. Network access is also defined in Sections 151(3) and (4) of the Act so as to include interconnection services and/or any services or facilities that would enable another communications provider to provide electronic communications services or electronic communication networks. We consider that a requirement to provide network access would, therefore, include any ancillary services as may be reasonably necessary for a third party to use the services.

14.34 In proposing this condition, we have also taken into account the factors set out in Section 87(4) of the Act. In particular, we consider that requiring BT to provide accommodation services is needed to secure effective competition because, as noted above, telecoms providers must purchase these services to use regulated products, and thus a refusal to supply could undermine the effectiveness of our overall package of remedies.

14.35 We consider that this proposal meets our duties under Section 3 and all the Community requirements set out in section 4 of the Act. In particular, the obligations are aimed at promoting competition by ensuring that communication providers are supplied with interconnection, accommodation services that they require to use the wholesale services BT supplies effectively, including those services provided pursuant to the remedies proposed in this review.

14.36 Sections 47 and 49 require conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed conditions are:

- objectively justifiable, in that they facilitate and encourage access to BT's network and therefore promote competition to the benefit of consumers;
- not unduly discriminatory, as they are proposed only for BT and no other operator has been found to hold a position of SMP in these markets;
- proportionate, in that they prevent BT from exploiting its SMP by withdrawing these interconnection and accommodation services; and
- transparent, in that the conditions are clear in their intention to ensure that BT provides access to its networks in order to facilitate effective competition.

14.37 We set out how our approach to regulating the prices of interconnection and accommodation services satisfies the applicable legal tests in Volume 2 of this consultation.

### **The BEREC Common Position**

14.38 We have also taken utmost account of the BEREC Common Position including BP7, BP7a and BP20 which appear to us to be particularly relevant in this context.

14.39 We consider that our decisions are consistent with the best practice set out in the BEREC Common Position.

### **Consultation question**

Question 14.1: Do you agree with the specific remedies for interconnection and accommodation that we propose? Please provide evidence to support your views.

## 15. Quality of service remedies

- 15.1 This section outlines our proposed quality of service (QoS) remedies for the markets in which we have provisionally identified BT as having SMP, which are:
- CI Access services at all bandwidths in the UK<sup>362</sup> excluding the Central London Area and the Hull Area, which we discuss in Section 6; and
  - CI inter-exchange circuits at all bandwidths at non-competitive BT exchanges, which we discuss in Section 7.
- 15.2 We set out our proposals for QoS remedies in the wholesale business connectivity markets in the UK. Business connectivity services are described in more detail in Section 3.
- 15.3 We are proposing broadly the same form of remedies for QoS as those in the 2016 BCMR and the Temporary Conditions statement and we set out our proposals and rationale for doing so below. The QoS remedies we are proposing seek to address the competition concerns we identified in Section 10.

### Summary of proposals

- 15.4 In the absence of *ex ante* regulation, there is a risk that Openreach will degrade QoS for Ethernet provisioning and repair. This would be detrimental to all telecoms providers, including BT's downstream businesses, and ultimately end-users. We therefore consider it appropriate to impose QoS remedies to ensure Openreach maintains its service quality at standards that meet customer needs and expectations.
- 15.5 We propose to set a quality of service SMP condition requiring BT to comply with all such QoS standards and reporting requirements as Ofcom may from time to time direct in relation to the wholesale business connectivity markets. Pursuant to this condition, we propose to make:
- a direction setting QoS standards for provisioning and repair; and
  - a direction requiring Openreach to provide data in relation to specified Key Performance Indicators (KPIs).
- 15.6 It is our view that the broad framework we set out in 2016 BCMR and the Temporary Conditions has helped ensure the delivery of significant improvements in service quality for Ethernet provisioning and does not currently require major amendments. We are proposing some changes to the levels of the QoS standards.
- 15.7 In addition to standards and KPIs, Service Level Agreements (SLAs) and Service Level Guarantees (SLGs) are the other important means we propose to use to encourage Openreach to provide an appropriate level of quality of service. We propose Openreach should be required to have certain SLAs and SLGs for provision and repair of Ethernet

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<sup>362</sup> In Section 5, we provisionally defined a number of geographic markets for CI Access services. In Section 6, we provisionally found BT to have SMP in the Metro Areas; all other HNR areas; BT+1 areas; and BT Only areas.

services. In line with the approach taken in the 2018 WLA, rather than impose these obligations in a direction, we propose to include less prescriptive obligations in the condition requiring Openreach to publish an RO.

## QoS standards

- 15.8 We are proposing limited changes to the overall framework for assessing Openreach's compliance with the QoS standards.<sup>363</sup> We are, however, proposing some adjustments to the levels of the standards and the removal of one of the measures (the lower percentile limit). In particular, we expect Openreach to make further improvements in its performance in delivering against the initial delivery dates it provides to customers (certainty standard) by the end of the review period.
- 15.9 We propose to include dark fibre within the scope of the QoS standards in the second year of the market review period<sup>364</sup>. We propose to impose QoS standards on Ethernet services in the CI Access services market in areas where BT is the only network provider or there is only one competing network, and in the CI Inter-exchange connectivity market at BT exchanges where it is the only provider or where there is only one other provider present. We do not propose to impose QoS standards in the Metro Areas or other HNR areas, or on WDM circuits.

**Table 15.1: Proposed QoS standards for Ethernet services**

QoS standard	Proposed level
<b>Mean time to provide across orders</b>	No more than 38 working days
<b>Upper percentile limit for provisions</b>	Year 1: No more than 3% delivered in more than 138 working days Year 2: No more than 3% delivered in more than 130 working days
<b>Certainty: % of orders completed on or before initial Contractual Delivery Date (iCDD)</b>	Year 1: 85% Year 2: 88%
<b>Certainty Cross-Link: Maximum mean period for the iCDD</b>	No more than 53 working days
<b>% of faults repaired within the SLA</b>	At least 94% of faults repaired within the SLA

<sup>363</sup> In the 2016 BCMR we referred to QoS standards as Minimum Service Levels (MSLs) but for consistency with QoS regulation in the 2018 WLA Statement we will now refer to them as QoS standards.

<sup>364</sup> We propose to apply QoS standards to dark fibre which only applies to the CI Inter-exchange connectivity market for connections from BT Only exchanges.

## KPIs

- 15.10 We propose an overall reduction in the number of KPIs that Openreach is required to report on, while retaining the KPIs that we consider are most useful to us and to stakeholders. We have also proposed to amend some KPIs. This is to ensure the information we collect from Openreach is still useful, and therefore proportionate, to our monitoring of quality of service.
- 15.11 We propose to extend the product scope of the KPIs to include VHB services (Ethernet and WDM) and dark fibre. We also propose the KPIs should be reported for all areas where we propose to find SMP and separately for the areas where we propose to impose QoS standards.
- 15.12 We are also proposing to impose a new reporting requirement in relation to the ‘tail’ of orders that take the longest time to be installed. This is to ensure that we have a better understanding of the drivers of these delays and to encourage Openreach to focus on improving its performance in relation to all types of orders.

## SLAs and SLGs

- 15.13 We are not proposing to reapply the SLG Direction. Instead we propose to include elements of the 2008 SLG Directions in BT’s RO condition, including a requirement that SLG payments are made on a proactive basis by BT.
- 15.14 We have provided some guidance for telecoms providers as to how we would be likely to make an assessment of the relevant factors in determining the appropriate SLA quantum. We consider that this guidance could help facilitate agreement between the parties.

## Summary of existing regulation

### Temporary Conditions

- 15.15 We first imposed QoS regulation in the 2016 BCMR when we considered Openreach’s Ethernet provisioning to be in crisis. Our intention was to require, over the course of the review period, improvements in performance to levels last seen in 2011.
- 15.16 Following the BCMR Judgment and the revocation of the 2016 BCMR’s SMP conditions in relation to CISBO services, we needed to put in place regulation to ensure the business connectivity market continued to function for citizens and consumers. As the QoS remedies had been consulted on and had not been challenged as part of BT’s appeal, we decided it was appropriate to impose broadly the same remedies for QoS as had been put in place for the 2016 BCMR.<sup>365</sup> Table 15.2 below summarises the regulation imposed under the Temporary Conditions.

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<sup>365</sup> We note that in the Temporary Conditions we did not impose QoS standards for Very High Bandwidth services.

Table 15.2: QoS standards for Ethernet services until 31 March 2019

QoS standard	Performance over compliance period (1 Dec 2017 – 31 Mar 2019)
Mean time to provide across orders	No more than 40 working days
Lower percentile limit	At least 40% of provisions delivered in 29 working days or less
Upper percentile limit	No more than 3% of provisions delivered in more than 118 working days
% of orders completed on or before iCDD	88%
Maximum mean period for the iCDD	No more than 55 working days
% of faults repaired within 5 hours	At least 94% of faults repaired within 5 hours

15.17 At the time of setting the Temporary Conditions there were only 16 months of the original review period left to run. Therefore, we adjusted the compliance term to one single period. This is will end on 31 March 2019.

### Structure of the remainder of this section

15.18 This section is structured as follows:

- our competition concerns;
- Openreach QoS performance;
- summary of stakeholder inputs and recent relevant research;
- proposed SMP condition and QoS standards for Ethernet provisioning and repair;
- transparency of QoS performance;
- service level agreements and service level guarantees;
- impact of proposed QoS standards on Openreach resources;
- legal tests; and
- consultation question.

### Our competition concerns

15.19 In light of our provisional assessment that BT has SMP in the business connectivity markets we have identified in Sections 6 and 8, we are concerned that, in the absence of appropriate *ex ante* regulation, Openreach would have the ability and incentive to provide sub-optimal QoS to the detriment of downstream leased line providers and end-users. The poor performance that pertained prior to 2016 in the absence of specific QoS standards supports this view.

15.20 In competitive markets, QoS would be based on the commercial judgment of individual companies and in combination with other facets of the service including price and other terms, could be expected to meet the requirements of the end-user for the company to

maximise sales. However, where a provider has SMP in a market, as we propose is the case for BT in the markets for leased lines, competition cannot be expected to be an effective constraint and the dominant provider could have the ability and incentive to degrade service quality to maximise its profits.

## Openreach QoS performance

15.21 Here we summarise Openreach’s performance prior to the imposition of the QoS standards in 2016 and review its performance since that time.

### Performance prior to 2016 BCMR QoS standards were imposed

15.22 Before the imposition of the QoS standards in 2016, Openreach Ethernet provisioning was in crisis. Communication with customers was viewed as being poor – customers did not receive adequate information about when they could expect to receive circuits, mean lead times to provide were high, and some circuits were taking over 900 working days to deliver.

15.23 In the 2016 BCMR we set out in detail what we assessed to be the key failures in Openreach’s provisioning performance.<sup>366</sup> This involved an evaluation of its processes, resourcing levels and overall performance and it was found to be deficient in almost all areas. The exception was fault repair performance which Openreach maintained at around 94%, and we considered acceptable.

### Performance since 2016

15.24 Since the imposition of the QoS standards in 2016, we have seen a significant improvement in Openreach’s Ethernet provisioning performance. Openreach has responded to the regulation and made changes to its procedures and processes to improve provisioning standards.

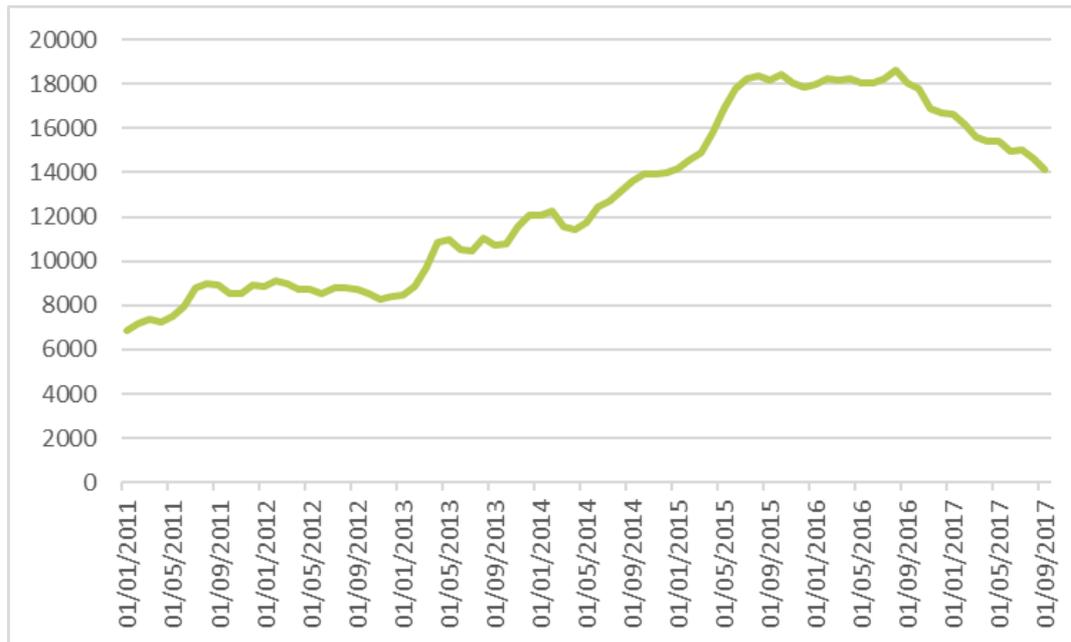
15.25 Openreach’s Ethernet customers have also told us that the level of performance has improved significantly and QoS is no longer in crisis. They have however urged us to sustain the standards that have now been achieved and push Openreach to improve further.

15.26 In the 2016 BCMR, we observed a growing backlog of open orders in Openreach’s workstack.<sup>367</sup> As illustrated in Figure 15.3, this workstack peaked around the publication of the 2016 BCMR, and since then Openreach has taken steps to reduce it. This has contributed to an improvement in QoS performance, including against each of the QoS standards.

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<sup>366</sup> 2016 BCMR, from page 419.

<sup>367</sup> 2016 BCMR, Figure 12.26, page 272.

**Figure 15.3: Volume of live orders open at the end of each month<sup>368</sup>**

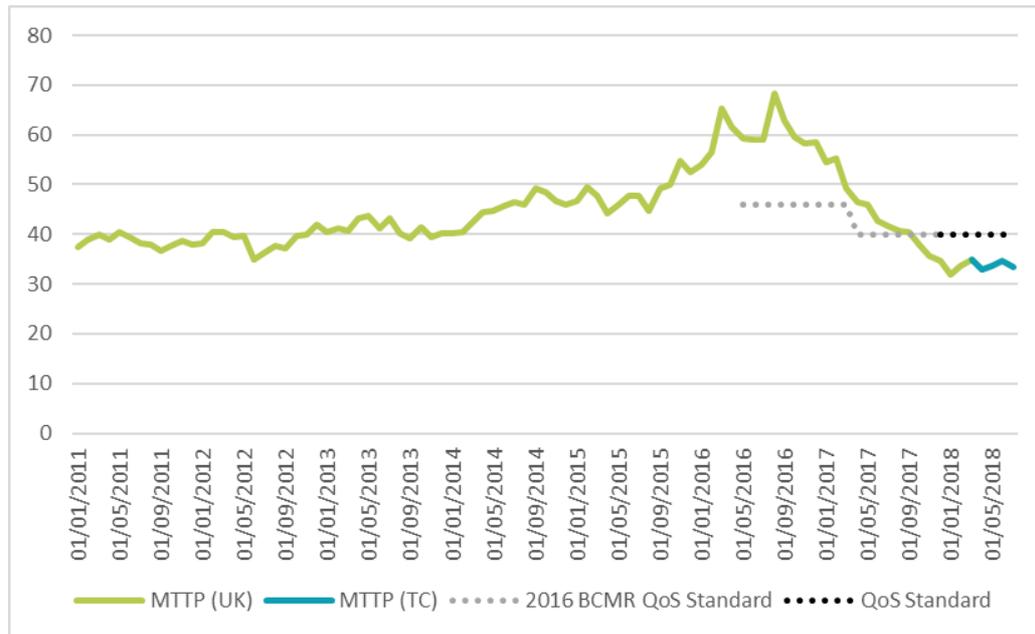
Source: Ofcom analysis of 12th BCMR s.135 notice, 10th 2016 BCMR s.135 notice, and 12th 2016 BCMR s.135 notice.

- 15.27 Openreach has told us that it has increased the operational resource applied to Ethernet delivery (both direct labour and contractor resource at the desk and in the field), it has made changes to its organisational structure, moving to a regional approach to draw on better local knowledge, and it has progressed the roll out of its Ethernet ordering platform, Equivalence Management Platform (EMP).<sup>369</sup>
- 15.28 Figures 15.4 to 15.8 below illustrate Openreach performance before and after imposition of QoS standards in the 2016 BCMR. Figure 15.9 only shows performance since the 2016 BCMR due to absence of comparable earlier statistics. We have shown the QoS standard contained in the Temporary Conditions in each graph, starting from 1 December 2017. It is important to note that, in each case, the requirement on Openreach is to meet the standard across the period up to 31 March 2019 as a whole. Because that date is in the future, it is not yet possible to conclude that individual standards have been met or missed, although it is informative to see current performance relative to the standard.

<sup>368</sup> Orders that are validated, but subsequently cancelled by the telecoms provider or third party, are excluded from the volumes presented here.

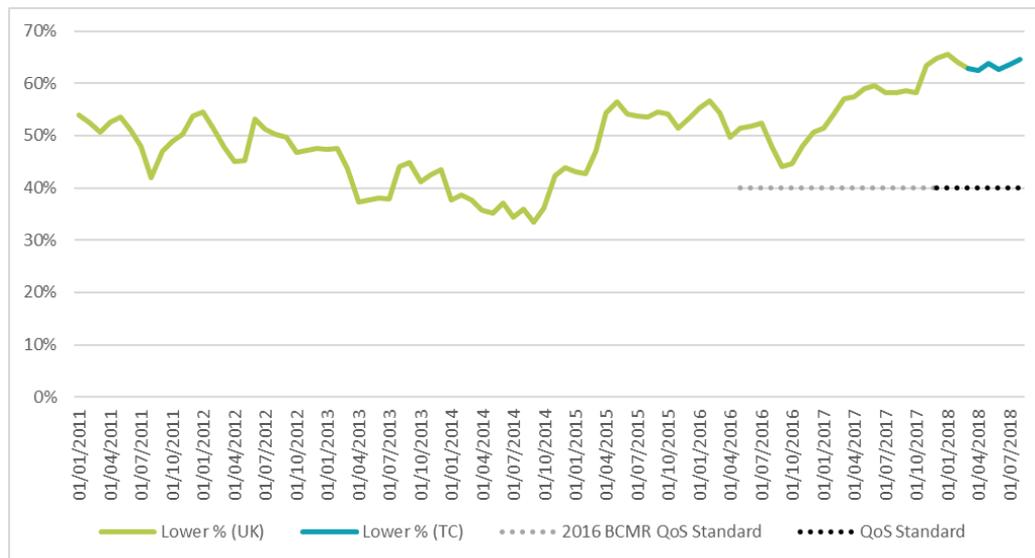
<sup>369</sup> Openreach submission, as part of this review, *Summary of Openreach's current position on Ethernet Quality of Service*, 20 July 2018 (p11).

Figure 15.4: Mean time to provide (MTTP), in days<sup>370, 371</sup>



Source: Ofcom analysis of 12<sup>th</sup> BCMR s.135 notice, Openreach Ethernet KPI reports, and the 10<sup>th</sup> 2016 BCMR s.135 notice.

Figure 15.5: Percentage of orders completed within 29 days (lower percentile)<sup>372, 373</sup>



Source: Ofcom analysis of 12<sup>th</sup> BCMR s.135 notice, Openreach Ethernet KPI reports, and the 10<sup>th</sup> 2016 BCMR s.135 notice.

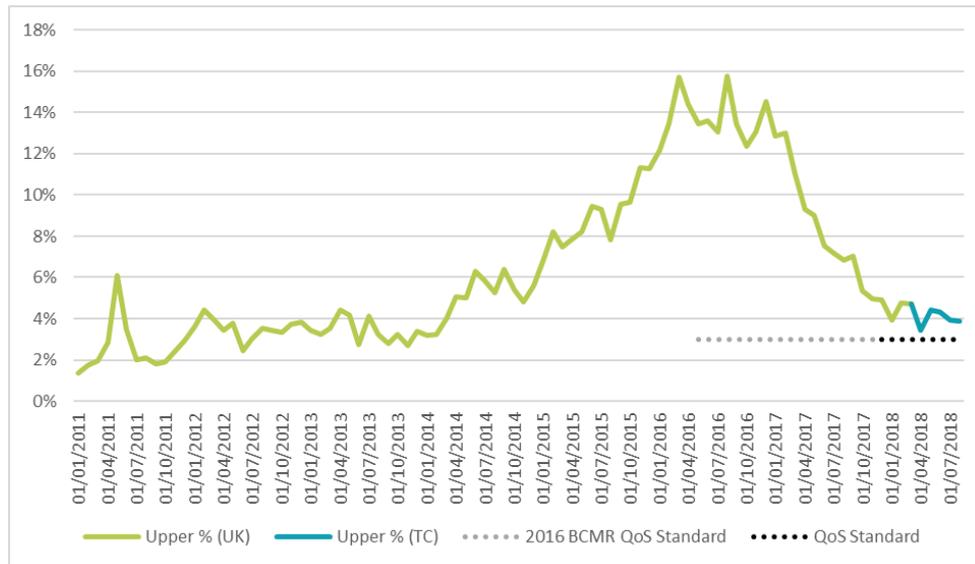
<sup>370</sup> In this figure, MTTP performance below the Temporary Conditions level indicates performance within the QoS standard.

<sup>371</sup> In this figure, the time period until March 2018 reflects performance across the whole UK, with subsequent performance reflecting those parts of the UK that are regulated under the Temporary Conditions.

<sup>372</sup> In this figure, a percentage above the Temporary Conditions QoS standard level indicates performance within the QoS standard.

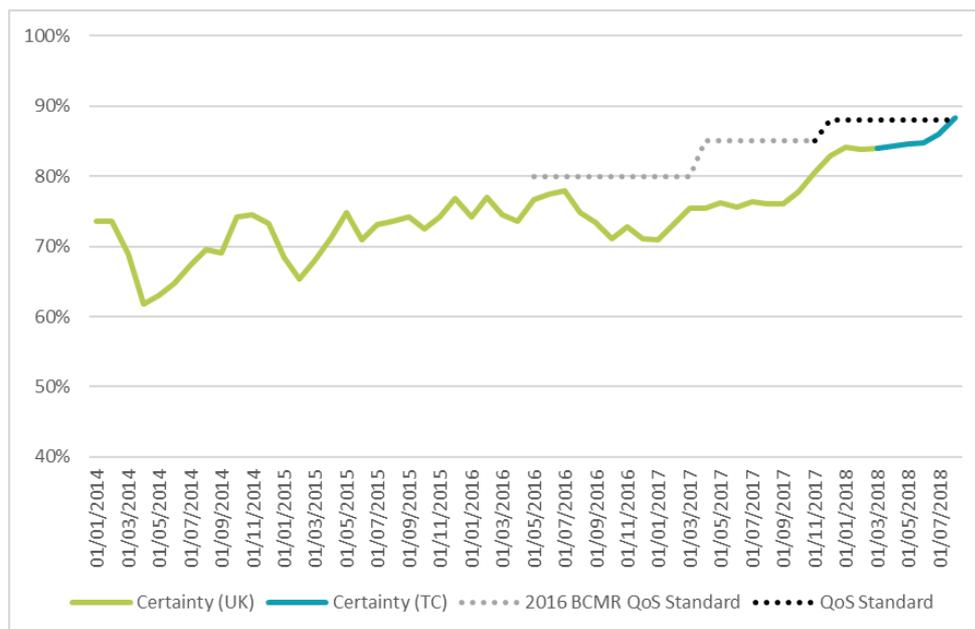
<sup>373</sup> In this figure, the time period until March 2018 reflects performance across the whole UK, with subsequent performance reflecting those parts of the UK that are regulated under the Temporary Conditions.

Figure 15.6: Percentage of orders not completed within 118 days (upper percentile)<sup>374 375</sup>



Source: Ofcom analysis of 12<sup>th</sup> BCMR s.135 notice, Openreach Ethernet KPI reports, and the 10<sup>th</sup> 2016 BCMR s.135 notice.

Figure 15.7: Percentage of orders completed within iCDD<sup>376 377</sup>



Source: Ofcom analysis of 12<sup>th</sup> BCMR s.135 notice, Openreach Ethernet KPI reports, and the 10<sup>th</sup> 2016 BCMR s.135 notice.

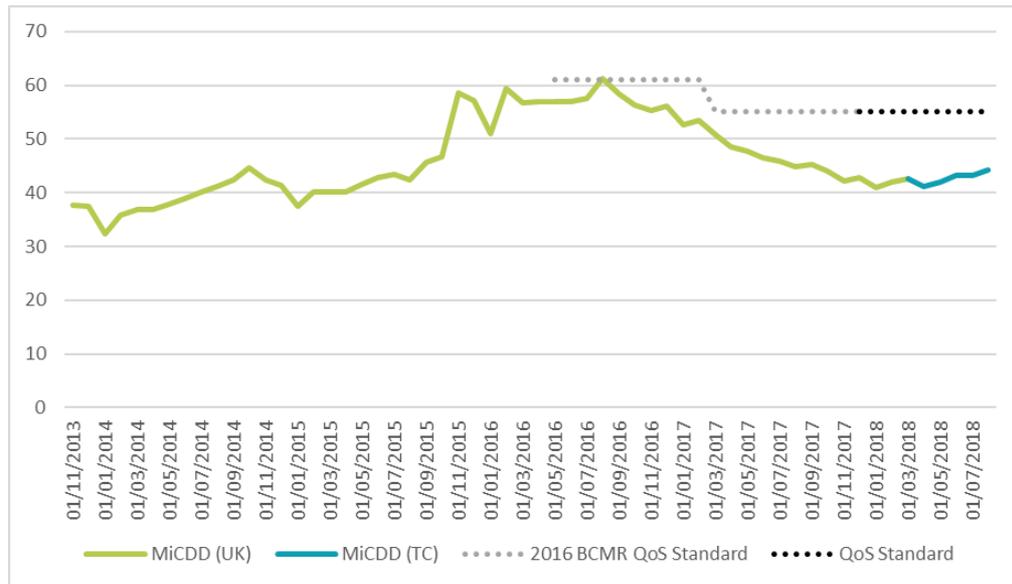
<sup>374</sup> In this figure, a percentage below the Temporary Conditions QoS standard level indicates performance within the QoS standard.

<sup>375</sup> In this figure, the time period until March 2018 reflects performance across the whole UK, with subsequent performance reflecting those parts of the UK that are regulated under the Temporary Conditions.

<sup>376</sup> In this figure, a percentage above the Temporary Conditions QoS standard indicates performance within the QoS standard.

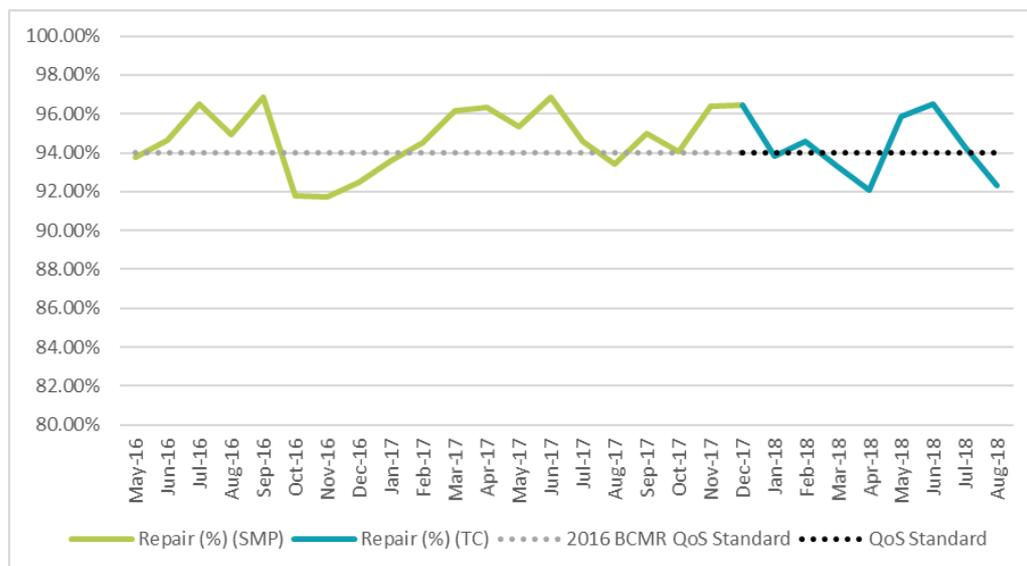
<sup>377</sup> In this figure, the time period until March 2018 reflects performance across the whole UK, with subsequent performance reflecting those parts of the UK that are regulated under the Temporary Conditions.

Figure 15.8: Mean initial contractual delivery date<sup>378 379</sup>



Source: Ofcom analysis of 12th BCMR s.135 notice, Openreach Ethernet KPI reports, and the 10th 2016 BCMR s.135 notice.

Figure 15.9: Percentage of repairs fixed within the SLA<sup>380 381</sup>



Source: Ofcom analysis of Openreach Ethernet KPI reports.

<sup>378</sup> In this figure, a mean iCDD below the Temporary Conditions QoS standard indicates performance within the QoS standard.

<sup>379</sup> In this figure, the time period until March 2018 reflects performance across the whole UK, with subsequent performance reflecting those parts of the UK that are regulated under the Temporary Conditions.

<sup>380</sup> In this figure, a percentage above the Temporary Conditions QoS standard indicates performance within the QoS standard.

<sup>381</sup> In this figure, the time period until March 2018 reflects performance across the whole UK where SMP was found in 2016 BCMR, with subsequent performance reflecting those parts of the UK that are regulated under the Temporary Conditions.

15.29 Table 15.10 below shows the performance in relation to the QoS standards set in the Temporary Conditions, noting in each case that compliance will depend on performance across the whole period to 31 March 2019. We observe that Year to Date performance in four of six of these QoS standards is within the levels that we set. The two remaining standards – Upper Percentile (%) and Certainty – have shown improvement, but not yet to the QoS levels set out in the Temporary Conditions.

**Table 15.10: Openreach performance in Temporary Conditions period<sup>382</sup>**

	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2018	Year To Date	QoS Standard
<b>MTTP</b>	35.9	32.3	33.8	34.4	33.0	33.6	34.7	33.4	33.8	33.8	40wd
<b>Lower %</b>	65.2%	67.0%	65.0%	64.0%	62.5%	63.8%	62.6%	63.5%	64.6%	64.1%	40%
<b>Upper %</b>	5.3%	4.3%	4.9%	4.5%	3.4%	4.4%	4.3%	3.9%	3.9%	4.3%	3%
<b>Certainty</b>	82.4%	83.1%	83.0%	83.4%	84.3%	84.6%	84.8%	86.0%	88.4%	84.5%	88%
<b>Certainty Cross-link</b>	43.7	40.8	41.7	41.2	41.1	42.1	43.2	43.2	44.1	42.3	55wd
<b>Repairs</b>	96.4%	93.8%	94.6%	93.7%	92.1%	95.9%	96.5%	94.3%	92.3%	94.3%	94%

Source: Openreach mandatory KPI reports.

## Summary of stakeholder inputs and recent relevant research

### Consumer research

15.30 Ofcom research carried out between November 2017 and January 2018 into the communication needs of large enterprises showed that issues around fixed connectivity were the most frequently raised and frustrating experiences for large enterprises, with only about one in five rating their provisioning experience as better than six out of ten. The key issues raised by respondents were long lead times, delays, uncertain delivery deadlines and lack of communication from the service providers. Large enterprises highlighted specific examples, such as engineer bookings being a frustrating experience (because of missed or incorrect visits) and shops and new homes not being able to open due to circuits not being complete on time.

15.31 Respondents recognised some of the possible underlying causes behind the difficulties they experienced, with wayleaves (which respondents recognised as sometimes being beyond the operator's control) and the organisational structure of suppliers causing perceived inefficiencies (and customers having to be proactive to find out the status of a circuit installation) cited as challenges.<sup>383</sup>

<sup>382</sup> This Year to Date figure relates to the Temporary Conditions period and hence runs from 1 December 2017 to 31 August 2018. "wd" = working days.

<sup>383</sup> 2018 Cartesian report, pages 36-38.

## Stakeholders' views on Openreach's performance to date

- 15.32 We sought input from stakeholders regarding quality of service in the course of preparing this consultation. Stakeholders commented that performance by Openreach has improved (some stakeholders noting significant improvements) since 2016. One stakeholder highlighted Openreach's improvement both in absolute and relative (compared to SMP operators in other European countries) terms.
- 15.33 There was general acknowledgement about underlying challenges to Openreach's performance on complex orders, including wayleaves and traffic management, and recognition that some of these are industry-wide issues.
- 15.34 Stakeholders commented that when they were proactive with and challenged Openreach in understanding the causes behind poor performance (namely, regarding tail orders), performance improved and there was a better experience with Openreach.

## Stakeholders' views on this consultation

- 15.35 There was a general desire to see the key elements of the regime outlined in the 2016 BCMR maintained – QoS standards, KPIs and SLGs – and for further improvements and amendments to each. Stakeholders did not express the view that there was a need for significant changes to the framework.
- 15.36 There was a view that any further improvements to performance should not be to the detriment of, or be recovered from, the charge control.
- 15.37 One stakeholder expressed concern about Openreach's focus switching to FTTP roll out, to the possible detriment of its focus on quality of service.
- 15.38 Some stakeholders noted that further work was required from Openreach to improve its tail orders performance, while improved performance from Openreach in regard to Mean Time to Provide (MTTP) was seen as a priority by a smaller number of respondents.
- 15.39 Certainty of delivery dates was identified as of paramount importance (particularly with complex orders), with one provider stating it would prefer certainty over speed of the order being completed (providing it is delivered when guaranteed). Some stakeholders requested either maintaining or increasing the current 88% QoS standard for certainty performance.
- 15.40 Some stakeholders requested new KPIs that Openreach should be required to provide to Ofcom or report on publicly. There was also a wish to maintain the transparency of Openreach publishing some of its KPIs online.
- 15.41 There were some requests for Ofcom to set the SLG quantum level in this consultation, in light of the OTA2-led discussion having failed to reach agreement. One stakeholder stated it would rather see higher QoS standards than higher SLG payments.

## Openreach pre-consultation submission to the 2019 Review

- 15.42 On 20 July 2018, Openreach provided a document to us entitled “Summary of Openreach’s current position on Ethernet Quality of Service”, which set out its views on its recent performance and how it considers the QoS regime should function going forward.
- 15.43 Openreach stated its performance improvements since 2016 have been significant, and that the overall package of QoS remedies has assisted this. It added it will continue to strive for service improvement independent from the QoS standards regime (for instance, highlighting the series of improvements under its “Re-imagining Ethernet provision” programme). It noted that stakeholder feedback suggests performance is at the required levels, highlighting a marked improvement in its Net Promoter Score<sup>384</sup> and positive anecdotal feedback from senior customer interactions.
- 15.44 Openreach stated there are several factors that Ofcom should consider when setting quality of service remedies, arguing that further increases are not required given performance is already at “very good and acceptable levels”. Openreach said that, because of the shorter period of this market review, a pragmatic approach of incremental improvements would be more suitable. Openreach also claimed that the complexity of circuit delivery has increased in recent years, and that Openreach is moving, or has moved, to a steady state, efficient level of operation, with further incremental improvements becoming increasingly difficult to achieve.
- 15.45 Openreach set out its views on its ability to meet QoS standards over the review period. It said that:
- it would be likely to be able to meet or exceed the current MTTP and lower percentile standards if continued over the review period;
  - the current upper percentile and certainty standards are extremely challenging on the basis of operational conditions and should be relaxed for efficiency reasons;
  - the certainty cross-link standard (which constrains the setting of initial delivery dates by setting a mean iCDD) is appropriate;
  - the current repair standard is broadly appropriate but should include a Matters Beyond Openreach’s Reasonable Control (MBORC)<sup>385</sup> allowance;
  - the current approach to scope, compliance period, product and order scope, treatment of delays and cost recovery are appropriate; and
  - regarding KPIs, Openreach argued a “more meaningful and insightful” set of KPIs could be created through reducing the volume of KPIs that Ofcom requests from Openreach, alongside amending, removing or replacing some of the current KPIs.

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<sup>384</sup> The Net Promoter Score is an index ranging from -100 to 100 that measures the willingness of customers to recommend a company’s products or services to others. It is used as a proxy for gauging the customer’s overall satisfaction with a company’s product or service and the customer’s loyalty to the brand.

<sup>385</sup> MBORCs are usually raised when Openreach’s network has experienced serious damage caused by extreme weather, or as a result of criminal or negligent damage caused by third parties.

- 15.46 In relation to SLGs, Openreach said it believes the current arrangement for negotiating new, or changes to the current, SLAs and SLGs should be maintained, but that the SLG quantum is excessive, and needs to be reviewed. Openreach also stated [Redacted].

## Proposed SMP condition and QoS standards for Ethernet provisioning and repair

### Introduction

- 15.47 This section sets out our proposal to reimpose the SMP condition requiring BT to comply with any quality of service requirement we may direct in relation to network access provided by BT pursuant to general and specific network access obligations we have imposed, and our consideration of possible QoS standards we will direct under the SMP condition for Ethernet provisioning and repair. We consider it appropriate to retain the QoS framework as developed in the 2016 BCMR and the Temporary Conditions as this has delivered good outcomes in terms of provisioning and fault repair performance.
- 15.48 In the 2016 BCMR, we set out our assessment of the reasons behind Openreach’s poor provisioning performance before 2016.<sup>386</sup> We have not repeated that in this document as we consider that there is an industry-wide understanding of the issues that previously caused poor service delivery, and our focus here is on current performance levels and challenges to further improvement.
- 15.49 The QoS standards framework that we imposed in 2016 was completely new and was the first intervention of its kind in the business connectivity markets. We are broadly satisfied with the outcomes and consider that the overall framework is functioning well in delivering a better QoS for Openreach Ethernet customers. However, it is appropriate to use this new review as an opportunity to consider where we can make improvements and to ensure that the regime remains proportionate in terms of the requirements imposed on BT.
- 15.50 Openreach has told us about several initiatives to improve Ethernet delivery performance and the customer experience under the umbrella “Re-imagining Ethernet provision”. Openreach shared its initial proposals with industry on 4 July 2018 at the OTA2 Executive meeting. It has subsequently published a consultation on its website<sup>387</sup> and commenced bilateral engagement with its Ethernet customers. Based on its current timetable, some of these initiatives, such as a simple query and quotation portal to accelerate planning for easy orders, could become operational from 2019.<sup>388</sup> This suggests that within the market review period there ought to be some scope for Openreach to perform better in relation to

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<sup>386</sup> 2016 BCMR, Volume 1, from page 397.

<sup>387</sup> Available to stakeholders at:

<https://www.openreach.co.uk/org/home/updates/briefings/ethernetservicesbriefings/ethernetservicesbriefingsarticles/eth05518.do> (Openreach login required).

<sup>388</sup> Openreach supporting information slides provided to Ofcom, 6 September 2018.

QoS and in Ethernet delivery performance, albeit we also recognise the challenges that exist to such improvements.

- 15.51 In the 2016 BCMR, we set out in detail the reasons we considered QoS standards were necessary to facilitate effective Ethernet provisioning<sup>389</sup> so the market could function well. As part of our assessment for this market review, we have revisited our reasoning. Based on the evidence available to us, despite the improvement in provisioning performance, we consider the reasoning still holds. The ability and sufficiently strong incentives still exist for Openreach, absent *ex ante* QoS regulation, to degrade service quality. The situation that pertained prior to 2016 illustrates this point.
- 15.52 Below we discuss our remedy design principles and proposals for each of the QoS standards.

### Remedy design principles

- 15.53 In light of the performance data and stakeholder views that we set out earlier in this section, it is clear to us that there is still work Openreach can do to improve the service quality it provides in Ethernet provisioning. However, we acknowledge the significant improvement that has been made relative to the position at the time of our last full assessment in 2016.
- 15.54 We consider it appropriate to continue to refer to the guiding principles we set out in the 2016 BCMR around remedy design for the QoS standards. We have added two further considerations to the bottom of this list:
- acknowledging the complexity and variety in Ethernet order types;
  - recognising the trade-off between delivery date certainty and the time to provide;
  - not tying remedy design to any categorisation of orders that may exist due to possibility that these may change;
  - balancing timely issuing of Contractual Delivery Date (CDD)<sup>390</sup> with the probability of that CDD being met;
  - considering the impact on incentives to compete and invest in telecommunications networks; and
  - acknowledging that there will be limits to the extent Openreach can improve QoS due to exogenous factors which impact overall performance.

### Mean Time to Provide – Ethernet provisioning lead times

- 15.55 As noted above, lead times for Ethernet delivery have improved since 2016 when the mean time to provide (MTTP) an Ethernet circuit was 48 working days. Openreach performance for the period December 2017 – May 2018 was 33.8 working days compared with the

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<sup>389</sup> 2016 BCMR, Volume 1, pages 424-428.

<sup>390</sup> A CDD is a date provided by Openreach to a telecoms provider on which Openreach contracts for an order to become a completed order.

current 40 working day QoS standard. This follows the general trend for improvement in Openreach provisioning performance since the introduction of the QoS standards.

- 15.56 While Openreach’s contractual provisioning time as set out in the Connectivity Services contract<sup>391</sup> remains at 30 working days, for a number of the more complex circuits where infrastructure build is required, delivery can take significantly longer. The table below illustrates the difference in MTTP based on category of order.

**Table 15.11: Mean time to provide for each provision category, by financial year<sup>392</sup>**

Financial Year	Cat 1	Cat 1.1	Cat 1.2	Cat 2	Cat 2.1	Cat 2.2	Cat 3	Cat 4	Cat 4.1	Cat 4.2
<b>2015/16</b> <sup>393</sup>	21.7	7.7	15.9	79.0	53.2	73.3	216.9	59.0	-	-
<b>2016/17</b>	54.2	11.5	28.6	179.1	62.2	89.1	211.0	185.1	41.7	46.4
<b>2017/18</b>	38.2	11.9	27.5	125.9	63.1	91.8	139.4	324.3	44.6	108.2

Source: Ofcom analysis of 12th BCMR s.135 notice.

- 15.57 Table 15.12 below shows the proportion of orders completed in each provision category, which suggests a significant shift from Category 2 (including 2.1 and 2.2) orders to Category 1 (including 1.1 and 1.2) orders, which are easier to deliver on average, over the last couple of years (though Openreach has made revisions to its categories during the same period).<sup>394</sup>

- 15.58 Separately, Openreach has told us that performance against this measure is beginning to plateau but it considers a lower MTTP could be appropriate.<sup>395</sup>

**Table 15.12: Proportion of orders completed in each provision category, by financial year<sup>396</sup>**

Financial Year	Cat 1	Cat 1.1	Cat 1.2	Cat 2	Cat 2.1	Cat 2.2	Cat 3	Cat 4	Cat 4.1	Cat 4.2
<b>2015/16</b> <sup>397</sup>	31.9%	4.8%	1.8%	51.9%	1.9%	0.1%	2.2%	2.8%	-	-
<b>2016/17</b>	2.3%	19.8%	40.2%	13.4%	12.7%	5.4%	3.0%	0.7%	0.2%	0.0%
<b>2017/18</b>	3.6%	23.2%	45.6%	2.4%	11.7%	8.6%	2.4%	0.1%	0.3%	0.0%

Source: Ofcom analysis of 12<sup>th</sup> BCMR s.135 notice.

<sup>391</sup> Published on the Openreach website:

<https://www.openreach.co.uk/orgp/home/products/ethernet-services/contracts/contracts.do> [accessed 30 October 2018].

<sup>392</sup> In this table, these performance figures reflect those parts of the UK that were regulated in each time period.

<sup>393</sup> From November 2015 to March 2016.

<sup>394</sup> A description of Openreach’s order categorisation process, including revisions made to the categories in 2016 can be found in its submission, as part of this review, *Summary of Openreach’s current position on Ethernet Quality of Service*, 20 July 2018 (Annex 1).

<sup>395</sup> Page 14, *Summary of Openreach’s current position on Ethernet Quality of Service*, 20 July 2018.

<sup>396</sup> In this table, these performance figures reflect those parts of the UK that were regulated in each time period.

<sup>397</sup> From November 2015 to March 2016.

- 15.59 We understand speed of delivery is still an important factor in Ethernet provisioning for Openreach customers. Accordingly, it is our intention to retain a MTTP standard.
- 15.60 We propose to impose a stricter MTTP standard in this review period, reducing the required MTTP from 40 to 38 working days. We consider that this is efficiently achievable and meets customer expectations of improved service levels over time. Indeed, Openreach performance indicates it is likely to achieve this level in the period covered by the Temporary Conditions.
- 15.61 We do not consider it necessary or appropriate to reduce the level down to current levels of performance. We consider a mean time of 38 days is justified in light of the engineering complexity associated with Ethernet provisioning and the possibility that the order mix may change in the market review period in a way that creates some upward pressure on MTTP. We also note that there is some efficiency risk in setting a stricter standard that could ultimately drive up costs for customers.

### Upper percentile

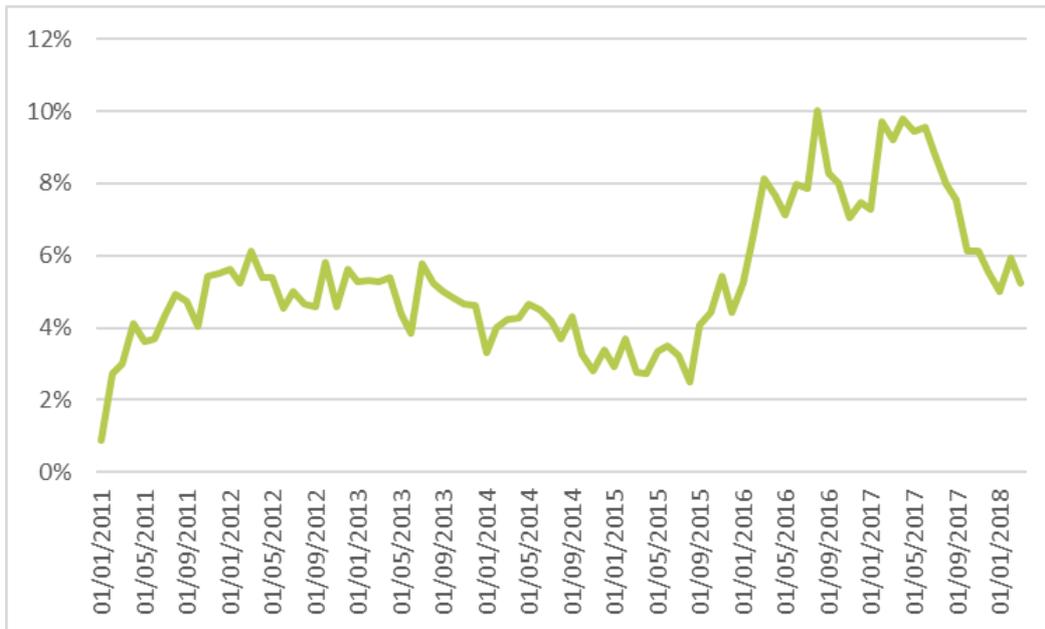
- 15.62 The upper percentile standard is intended to protect customers whose orders fall into the ‘tail’ of complex orders from excessively long lead times. The measure we set in 2016, and again in the Temporary Conditions, sought to limit the number of circuits that take over 118 working days to not more than 3% of all completed orders.
- 15.63 As observed above, Openreach has made a significant improvement in its upper percentile performance. However, current performance is lower than the standard we set in the Temporary Conditions (which applies to the whole period to 31 March 2019).
- 15.64 Openreach has made representations to us<sup>398</sup> that the number and complexity of orders within the ‘tail’ is increasing and that this is making it increasingly difficult for it to achieve the upper percentile standard. It attributes delays in those cases where provisioning takes a particularly long time to the difficulty obtaining third party wayleaves as well as geography, dig distance and traffic management permissions required.
- 15.65 We collected evidence on 2017/18 orders<sup>399</sup> to assess Openreach’s claim that complex orders are increasingly prevalent and becoming more complex than in 2011 (the benchmark we used when originally setting the provisioning QoS standards in the 2016 BCMR). This showed that the temporary spike in the complexity of orders completed in 2016/17 (when Openreach was clearing the backlog) was not representative.
- 15.66 However, the proportion of orders requiring wayleaves and/or traffic management (key drivers of delay for tail orders) appears to be settling at a higher level than in 2011 and is more comparable with 2012 and 2013, as shown in Figures 15.13 and 15.14 below. Types of delay differ in the extent to which they are within Openreach’s control, and wayleaves and traffic management are examples where (depending on the precise circumstances) third party factors make some contribution to the delay.

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<sup>398</sup> Page 18, *Summary of Openreach’s current position on Ethernet Quality of Service*, 20 July 2018.

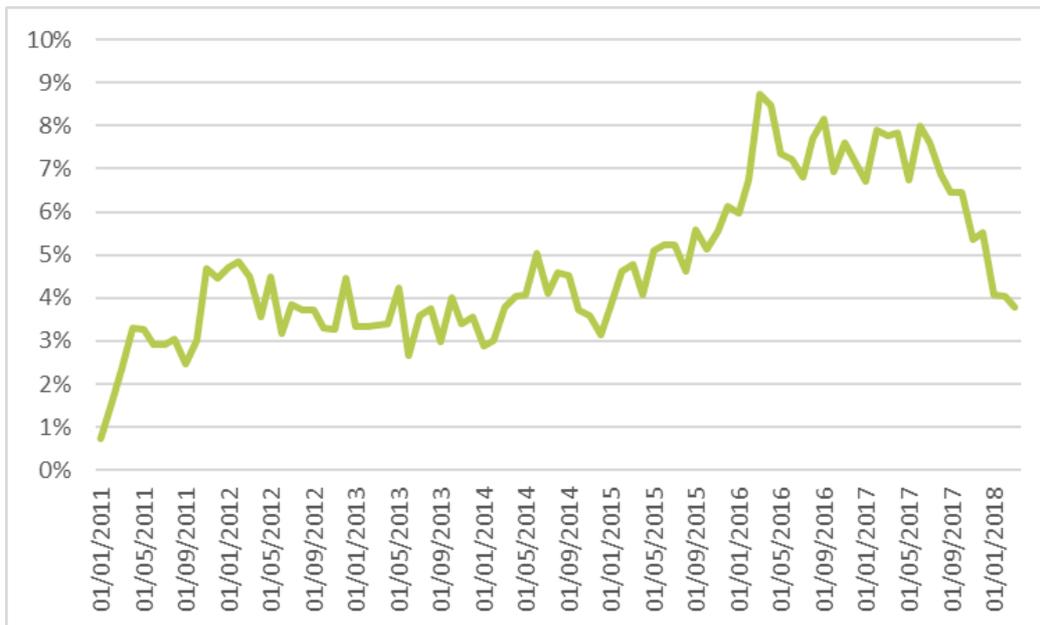
<sup>399</sup> Openreach response to the 12<sup>th</sup> s.135 notice dated 22 May 2018.

**Figure 15.13: Percentage of orders that were delayed that had a traffic management delay**



Source: Ofcom analysis of 12<sup>th</sup> BCMR s.135 notice.

**Figure 15.14: Percentage of orders that were delayed that had a wayleave delay**



Source: Ofcom analysis of 12<sup>th</sup> BCMR s.135 notice.

15.67 Blocked, damaged or collapsed duct and manholes are an example of delay that is within Openreach’s control. We consider that there is more Openreach can do to ensure the maintenance of its existing civil infrastructure, to limit the extent of such delays. Similarly, Openreach can more effectively manage the process of obtaining wayleaves and arranging traffic management with the relevant councils and highway authorities.

- 15.68 Hence, we propose to set an upper percentile standard that no more than 3% of orders should be completed in more than 138 days (for year one of the market review period)<sup>400</sup> and 130 days for 2020/21 (year two). This proposal acknowledges there are challenges in setting the precise level in an area where exogenous factors come into play (wayleaves and traffic management orders are an industry-wide challenge) and recognises that the prevalence of complex orders may now be higher than was the case in 2011.
- 15.69 Setting the upper percentile standard at 3% for 138 days in year one and 130 days in year two will mean there can be no deterioration in Openreach performance against this measure relative to recent performance and it will limit the number of customers exposed to excessively long lead times.
- 15.70 As we have discussed above, Openreach has told us about a series of process improvements that it is in the course of implementing. This suggests there is potential for an improvement in Openreach's performance against the Upper Percentile standard over the period of the market review as these initiatives are implemented.
- 15.71 We consider that based on the evidence and recent performance, that in year two it is appropriate to require Openreach to provide no more than 3% of circuits in 130 days or more. This reflects the need to protect the vast majority of customers from excessively long lead times while acknowledging that there is still work to be done to minimise these lead times.

### Lower percentile

- 15.72 The lower percentile QoS standard was put in place to protect against the potential risk that Openreach's focus would shift exclusively to the tail or more complex orders, neglecting the easier 'quick win' circuits.
- 15.73 Openreach has been out-performing the QoS standard for the lower percentile measure by nine days or more since March 2017<sup>401</sup>, so our concerns about Openreach's focus shifting away from easier orders have not materialised.
- 15.74 We have provisionally reached the view that the MTTP standard provides sufficient incentive for Openreach to perform against the lower percentile metric. In order to achieve the MTTP standard it is imperative that Openreach completes a significant proportion of orders as quickly as it can. Accordingly, and in line with our guiding principles to remove regulation where it is no longer functional or proportionate, we do not consider it necessary to reimpose this standard on Openreach. However, as set out below, we are proposing to retain a KPI which will allow us and stakeholders to continue to monitor Openreach's performance against the lower percentile.

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<sup>400</sup> Year one of the market review period commences upon publication of the final statement and ends on 31 March 2020. Year two runs from 1 April 2020 to 31 March 2021.

<sup>401</sup> Openreach response to 16<sup>th</sup> BCMR s.135 notice.

### Certainty of initial CDD

- 15.75 Businesses and other end-users of leased lines services wish to have confidence regarding the date when their services will be installed. Hence the certainty of delivery dates provided by Openreach to its wholesale customers is a key quality of service issue.
- 15.76 Before we introduced Ethernet QoS standards in 2016, Openreach's performance in meeting the delivery dates initially provided to its customers was poor. We therefore introduced a standard for the delivery of circuits against the initial delivery date, which we refer to as the Certainty standard. In the Temporary Conditions we set a standard requiring that 88% of circuits should be delivered on or before the initial contractual delivery date (iCDD).
- 15.77 There has been a steady improvement in Openreach's performance against the Certainty standard over the last two years, particularly since late 2017, though it remains around 85%. We understand that Openreach introduced a number of performance improvement initiatives in 2017 with the intention of providing greater certainty against delivery dates.<sup>402</sup> This may explain the timing of the improvements in performance against this standard.
- 15.78 We propose to maintain the Certainty standard in its current form, as it is an important component of ensuring good quality of service to Openreach customers. In the absence of such a requirement, there is a risk that Openreach's performance would deteriorate, given its SMP in the relevant markets.
- 15.79 In setting the proposed Certainty standard, we have taken account of Openreach's performance since 2016 and its view that there are limits on the achievability of significant further performance improvements. In particular, Openreach has highlighted the external factors that make meeting delivery dates difficult for more complex orders and its current commercial limitations on the setting of delivery dates.<sup>403</sup>
- 15.80 We appreciate that it can be more challenging to predict accurate delivery dates for more complex orders. However, we note that while the number of closed orders subject to external factors such as wayleaves and traffic management orders appears to be settling at a level higher than in 2011 (when Ethernet provisioning performance was good), the proportion of such orders remains low. Furthermore, our proposed performance level allows more than one in ten orders to fail to meet the iCDD. This effectively permits a substantial share of the small number of the most complex orders to fail, provided that Openreach meets the standard for most of the much larger number of easier orders.
- 15.81 We also expect Openreach to continue to improve its planning processes to enhance the accuracy of its delivery dates, with the aim of providing more certainty to customers. As set out above, we understand that Openreach has commenced further improvement

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<sup>402</sup> For example, the [Redacted]. Openreach response of 9 March 2018 to 1<sup>st</sup> s.135 on BCMR Quality of Service measures.

<sup>403</sup> Openreach submission, as part of this review, *Summary of Openreach's current position on Ethernet Quality of Service*, 20 July 2018 (p23-26).

initiatives with the aim of enhancing its performance against the current standards (however some of these are subject to industry agreement),<sup>404</sup> so this suggests there is potential for further improvement relative to current performance.

- 15.82 In relation to contractual constraints on the setting of delivery dates, we note that Openreach recently set out proposals for changes to the Ethernet provisioning journey which would require contractual changes.<sup>405</sup> This includes proposals to give it more flexibility in the setting of delivery dates and hence greater certainty to customers. While it may take some time for such changes to be negotiated and implemented, we anticipate that they could facilitate further improvements in performance against the Certainty standard, particularly during the second year of the next market review period.
- 15.83 Taking account of all these considerations, we propose to set a standard of 85% for year one of the market review period and 88% for 2020/21 (year two).

### **Certainty Cross-link (mean initial CDD)**

- 15.84 To support the operation of the Certainty standard, we propose to retain the standard which sets a constraint on the setting of initial delivery dates. The purpose of the iCDD MTTP standard (which we now refer to us as the Certainty Cross-link standard) is to prevent Openreach from setting excessively long delivery dates (to ensure that they comply with the Certainty standard). In the Temporary Conditions, we set a standard requiring that the mean number of days to provide the circuit underlying the initial delivery date should not exceed 55 working days. This was derived by adding a ‘contingency allowance’ of 15 working days to the MTTP standard of 40 working days, to allow Openreach some limited flexibility in the setting of delivery dates given that estimating of lead times are subject to some uncertainty.<sup>406</sup>
- 15.85 We continue to consider it necessary to impose a Certainty Cross-link standard to provide a reasonable constraint on the setting of delivery dates. We note that Openreach is proposing to amend its current contract to give itself greater flexibility on the setting of delivery dates for individual orders. While this change could facilitate the setting of more achievable and accurate delivery dates, there is some risk that Openreach could game the Certainty standard by setting very long delivery dates. The Certainty Cross-link standard would therefore have a particularly important role in setting a mean level limit on the length of delivery dates set by Openreach, and hence we propose to retain the Certainty Cross-link standard in its current form. Given our proposal to set a MTTP standard of 38 working days or less for the duration of this market review period, we propose to set the Certainty Cross-link standard at 53 working days or less.

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<sup>404</sup> Attachment in email from Openreach to Ofcom on 13 August 2018 summarising ‘Reimagining Ethernet Initiatives’, including plans to [Redacted].

<sup>405</sup> Openreach, 2018. *Re-imagining Ethernet Provision*. Available to stakeholders at: <https://www.openreach.co.uk/orpg/customerzone/products/ethernetservices/ethernetaccessdirect/eadonemp/downloads/ReimaginingEthernetProvisionIndustrycondoc.pdf> (Openreach login required).

<sup>406</sup> This figure was the result of analysis performed in the 2016 BCMR (see pages 468-469).

## Repairs

- 15.86 Unlike provisioning, Openreach's performance in relation to repairs of Ethernet services has generally been stable and within its SLA. In 2016, when we first introduced QoS standards for provisioning we decided to impose a minimum standard in relation to repairs. We did this to mitigate the risk that repairs might be neglected if Openreach diverted resources to improve its performance in provisioning. We set the QoS standard at 94% of faults fixed within the agreed SLA, and this standard was maintained in the Temporary Conditions. Openreach's performance on repairs has generally exceeded the standard, though not by a significant amount when assessed on an annual basis (see Figure 15.9 above).
- 15.87 We propose to maintain the repairs QoS standard in its current form and at the current level of 94% of faults fixed within the SLA (currently five hours for Ethernet services and 18 hours for dark fibre circuits, based on the dark fibre reference offer of 2016) for the next market review period. We continue to regard it as appropriate to set a QoS standard for repairs, given that this is an important aspect of quality of service, and there is a risk that Openreach's performance might deteriorate if the standard were removed.

## MBORC events and the QoS standards

- 15.88 In proposing standards for both repairs and provisioning, we have considered how to take account of what Openreach refers to in its contracts as matters beyond our reasonable control (MBORC) incidents, which may impact on performance. MBORCs are usually raised when Openreach's network has experienced serious damage caused by extreme weather, or as a result of criminal or negligent damage caused by third parties. The principal purpose of MBORCs is the suspension of SLG payments for the area and period covered by an active MBORC. Events leading to MBORC declarations are more likely to affect performance against the repairs standard than the provisioning orders, because of the short period (typically five hours) within which repairs should be completed.
- 15.89 In a pre-consultation submission, Openreach proposed that we should include a fixed allowance of 2.5% within the repair standard to cater for MBORC events. It provided data as part of its submission suggesting the short-term performance against the repair standard has been impacted by MBORC events on a few occasions since April 2017.<sup>407</sup> However, we note that while weekly or monthly performance has sometimes dipped below 94%, the cumulative year-to-date performance measure (which we use to assess compliance) has remained above 94% in the Temporary Conditions period so far. Openreach's performance in the first year of the 2016 BCMR also exceeded the repairs standard.
- 15.90 In setting the level of the repairs standard in the 2016 BCMR and the Temporary Conditions, we recognised that MBORC events can have some short-term impact on Openreach's performance. We have not seen evidence to suggest that MBORC events for

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<sup>407</sup> Openreach submission, as part of this review, *Summary of Openreach's current position on Ethernet Quality of Service*, 20 July 2018 (pages 30-33).

Ethernet will increase in frequency in the future. However, if more frequent and/or more extreme events were to occur, then we consider a more appropriate response would be to take such MBORC delays into account in any compliance assessment or enforcement considerations we might open were Openreach to fail its repairs standard.

- 15.91 By setting and measuring the standards on an annual basis, rather than on a monthly basis, the impact of occasional short-term MBORC events on overall performance is reduced. Moreover, by incorporating MBORC delays within our repairs standard, we maintain an incentive on Openreach to react and recover as soon as possible. Introducing an allowance to exclude delays to repairs linked to events covered by MBORCs could incentivise Openreach to use MBORC declarations as a means of non-compliance for more minor issues/repairs, or generally become less rigorous in its application of MBORC management criteria.
- 15.92 We therefore propose to continue to include MBORC in the QoS standard metrics that we set, with no additional identified allowance.

#### **Customer and non-customer caused delay**

- 15.93 We propose to continue to exclude customer caused delays from the QoS standards for provisioning activities and our compliance assessment. This will limit the potential for Openreach's customers to game the QoS standard measures and will focus the standards on Openreach's performance.
- 15.94 We also propose to continue to include all "non-customer" caused delays in the QoS standard performance measures for provision activities and our compliance assessment. While we recognise that the delivery of Ethernet orders that require network build rely on some third-party involvement (e.g. landowners and local authorities), the planning and management of these orders should not be regarded as entirely outside of Openreach's control. We consider that as a network access provider Openreach should continue to face incentives to minimise non-customer caused delays in its provisioning activities.

#### **Tail orders reporting requirement**

- 15.95 As we have set out above, we propose to limit the number of circuits that take over 138 working days to complete in year one and 130 working days in year two to 3% of all orders. This is because we believe it important to limit the number of circuits which take a long time to be installed. However, as things stand, once an order has exceeded the number of days specified in the Upper Percentile standard, the immediate pressure to complete and deliver the circuit is reduced.
- 15.96 We would like to better understand the reasons behind the delays to tail orders so that we are better able to regulate to protect against excessively long lead times for all customers. Presently we have limited information regarding the drivers behind very long lead times, so we are proposing to require Openreach to provide this information to Ofcom on a quarterly basis. Specifically, we are seeking a report with additional information about the causes of delay in provisioning circuits that exceed 138 working days in year one and 130 working days in year two. In addition to providing valuable information on whether and

how we may incentivise better performance, this will serve as a further focus for Openreach to ensure it is doing all that it can to understand the causes and limit the time to provide the more complex tail orders.

- 15.97 We propose that this report should be signed off by Openreach’s CEO so that engagement with the issues that affect the upper percentile of Ethernet orders receive sufficient interest and engagement from senior Openreach management. We propose to agree the detail of the report in discussions with Openreach ahead of publishing our final statement.

### **Geographic scope to which the QoS standards will apply**

- 15.98 In Sections 6 and 7 we identify the markets where we provisionally find that BT has SMP. We now consider in which of these markets we propose to apply the QoS standards.
- 15.99 We propose to apply the QoS standards in the CI Access services market in BT Only and BT+1 areas, and in the CI Inter-exchange connectivity market at BT exchanges where we propose that BT has SMP (BT Only and BT+1 exchanges).
- 15.100 In these areas, our analysis, as outlined in Section 10, suggests the prospects for competition in the next market review period are limited. We therefore consider it necessary to impose QoS standards to protect wholesale access seekers and end-customers from a deterioration in Openreach’s quality of service.
- 15.101 We propose not to impose QoS standards in the Metro Areas or all other HNR areas of the CI Access services market.
- 15.102 In line with our strategy to incentivise investment in new networks, we are concerned that the imposition of QoS standards might restrict the potential for other competing providers to invest in offering alternative services, including competing on quality of service. Furthermore, given the greater prospects of competition in these areas, Openreach has less incentive to allow its quality of service to deteriorate. We therefore do not consider it proportionate to impose QoS standards in these areas. However, as we explain further below, we are proposing to apply KPIs in these areas, which will allow us and stakeholders to compare Openreach’s performance relative to the geographic areas where the QoS standards do apply.
- 15.103 We have assessed Openreach’s historic performance against the QoS standards in the geographic areas in which we are proposing to apply them, and we are satisfied that is sufficiently similar to performance across the UK as a whole to suggest that it is not appropriate to require an adjustment in the QoS standards proposed above.

### **Product scope to which the QoS standards will apply**

- 15.104 We propose to impose QoS standards on services at 1 Gbit/s and below for all EAD (including EAD LA), EBD and Cablelink (and variants or replacements of these products) in the geographic markets outlined above. We propose to continue to apply the standards to both provides and regrades of these products. This will address our competition concern that Openreach has an incentive to offer poor quality of service in relation to these products.

- 15.105 We also propose to apply QoS standards to Ethernet services of over 1 Gbit/s. These services were included within the scope of our QoS standards first imposed in the 2016 BCMR but have not been regulated since the imposition of the Temporary Conditions. Given the historic problems with Ethernet provisioning, and our SMP finding, we consider it appropriate to include higher bandwidth Ethernet services within the QoS standards.
- 15.106 In the 2016 BCMR we did not impose QoS standards on WDM services as they were limited in volume and the poor provisioning performance that we observed at that time was particular to Ethernet services. While there has been some increase in WDM circuits in recent years, there are still relatively few of them and we are not aware of concerns regarding the quality of service provided by Openreach in relation to these products. Recent performance data suggests WDM performance for MTTP is similar to what we have observed for Ethernet and [REDACTED].<sup>408</sup>

**Table 15.15: Comparison of WDM and Ethernet QoS standards performance<sup>409</sup>**

QoS Standard	WDM	Ethernet	Level
Mean Time To Provide	32.30	33.83	40 working days
Lower percentile limit	[REDACTED]%	64.09%	40%
Upper percentile limit	[REDACTED]%	4.29%	3%
Certainty	[REDACTED]%	84.48%	88%
Certainty Cross-link	[REDACTED]	42.28	55 working days
Repairs	[REDACTED]%	94.30%	94%

Source: Openreach mandatory KPI reports and Ofcom analysis of 16<sup>th</sup> BCMR s.135 notice.

- 15.107 We are proposing to require the provision of KPIs for VHB services (Ethernet services over 1 Gbit/s and WDM) in the markets where we find SMP. This will allow us to monitor Openreach's QoS performance in relation to WDM services, and if there were a significant deterioration in performance that was harmful to consumers, we could consider amending the QoS Direction to extend the scope of the QoS standards.
- 15.108 We do not propose to apply the QoS standards to legacy Ethernet services such as WES, WES LA, WEES, BES etc. These products are in the process of being withdrawn and are now low in volume, so we do not consider it appropriate to impose QoS standards on them.

### Dark fibre

- 15.109 In year two of the market review we propose to impose QoS standards on dark fibre circuits,<sup>410</sup> including them alongside the other Ethernet products covered by the QoS

<sup>408</sup> Openreach response to 16<sup>th</sup> BCMR s.135 notice.

<sup>409</sup> This table covers the time period from December 2017 to June 2018 for WDM, and from December 2017 to August 2018 for Ethernet.

<sup>410</sup> We propose to apply QoS standards to dark fibre in the CI Inter-exchange connectivity market for connections from BT Only exchanges.

standards. The inter-exchange dark fibre remedy is an intervention we consider essential for the effective functioning of this market. Absent QoS standards for these circuits, Openreach would have the ability and incentive to offer poor service levels for provisioning and fault repairs for the new inter-exchange dark fibre circuits.

- 15.110 We are not proposing to impose QoS standards on dark fibre in year one. This is because we propose to require Openreach to provide dark fibre one month after the publication of our final statement and we consider it proportionate to allow for any initial teething problems to be rectified as the new order and provisioning processes are put in place. It is also worth noting that QoS standards are measured on closed or completed orders and setting QoS standards for dark fibre circuits too early after their launch could result in a distortion of the results. Hence, we propose to apply QoS standards from year two.
- 15.111 While we anticipate that some of the dark fibre circuits will be a conversion of existing active circuits (and therefore will be unlikely to require civil engineering work) we do not propose to set different QoS standards in year two for the provisioning of dark fibre circuits, from those we set for active circuits. It would be difficult to determine achievable lower levels for dark fibre provisioning at this stage, given that the product has not yet become available. But we do not think dark fibre circuits should be harder on average to deliver than active circuits, so the QoS standards we are proposing for active circuit levels will provide a proportionate and conservative backstop in year two. Given the volumes of dark fibre are likely to be considerably lower than the total volume of Ethernet circuits, we do not think their inclusion will distort the standards.
- 15.112 In relation to repairs, as is the case for active Ethernet circuits, this is to be determined by the SLA, which in the 2016 reference offer for dark fibre was 18 hours.
- 15.113 Meanwhile, as we outline below, and in Annex 17, we are proposing that KPI data for dark fibre circuits should be made available in year one of the market review. This data should be provided from the date of the launch of the dark fibre product.

#### **Compliance period and geographic level**

- 15.114 We are proposing annual monitoring of the QoS standards in the next market review period. Our reasoning for doing so is set out below:
- Ethernet volumes are relatively low and therefore annual monitoring avoids errors due to small sample sizes;
  - the lead time for some orders can be very long where extensive network build is required and typically lead times can stretch beyond one month, therefore more frequent monitoring could distort the results due to seasonality or ordering cycles; and
  - annual measures are less prone to short term peaks and troughs in demand and resourcing.
- 15.115 We propose to assess compliance with the QoS standards at a national level, across the geographic markets that we propose to apply them. Given the relatively low volume of Ethernet orders (compared to copper services), we do not think it would be appropriate to apply them at geographical market or regional levels. We do, however, propose to require

the provision of KPIs at regional level and broken down by each of the different access and inter-exchange markets.

## Transparency of QoS performance

15.116 In this sub-section, we set out our proposals to continue to direct BT to provide quality of service information in the form of KPIs under our quality of service SMP condition and KPI direction.

### Our reasoning for requiring BT to report KPIs

15.117 If the business connectivity markets were fully competitive, the quality of the services provided would be based on the commercial judgement of individual companies and could be expected to meet the requirements of end-users of the services, as providers would be incentivised to meet customer requirements to maximise sales. However, where a provider has SMP, competition cannot be expected to be an effective constraint and the dominant provider would have the ability and incentive to offer inadequate quality of service to increase profitability.

15.118 In addition, vertically integrated SMP operators have the ability and incentive to favour their own downstream business over third party telecoms providers by differentiating on price or terms and conditions. This discrimination can also take the form of variations in quality of service (either in service provision and maintenance or in the quality of network service provided by the dominant provider to external providers compared to its own retail operations). This has the potential to distort competition at the retail level by placing third party providers at a disadvantage in terms of the services they can offer consumers to compete with the downstream retail business of the vertically integrated operator.

15.119 *Ex ante* regulation may therefore be necessary to provide transparency about the QoS provided by the dominant provider (alongside the other QoS remedies we are proposing).

15.120 We consider that there are three reasons why it remains appropriate to direct BT to provide specified performance metrics:

- first, given we propose to direct BT to comply with QoS standards in some areas, KPIs enable us to monitor BT's compliance with these standards and provide transparency of BT's compliance with these measures for both telecoms providers and end-users;
- second, in areas where we do not consider specific QoS standards are necessary at present, but which may nevertheless be of potential concern to us, telecoms providers and/or end-users, KPIs provide visibility in case evidence emerges that intervention has become necessary; and
- third, requiring BT to provide performance metrics broken down by customer helps to address concerns regarding discriminatory conduct.

15.121 In light of the usefulness to Ofcom, telecoms providers, and end-users, we propose to maintain the direction requiring BT to provide the specified metrics.

## Proposed KPIs

- 15.122 We propose to continue to direct BT to provide a comprehensive set of QoS performance statistics. In the 2016 BCMR, we determined a list of 28 KPIs that BT was required to report on. Following consideration on how Ofcom uses the KPIs and stakeholder feedback, we have reviewed the current KPIs we request from BT, in light of the obligation on us to ensure proportionality. We have considered the following when evaluating each KPI imposed from the Temporary Conditions:
- retaining the KPI;
  - amending the KPI;
  - removing the KPI; and
  - creating a new KPI.
- 15.123 Overall, we are proposing to reduce the number of KPIs, from 28 to 18, to ensure that we are only requesting information where it adds value to Ofcom and stakeholders.
- 15.124 For ease of reference, below, we have included the associated KPI numbering from the KPI Direction in the Temporary Conditions. However, Direction 2 of our proposed legal instrument (Annex 23) uses updated numbering.

## KPIs we propose to retain

- 15.125 We propose to maintain the following KPIs and the requirement for BT to report these on a monthly basis. We continue to find these useful and necessary in relation to monitoring BT's QoS obligations, as well as maintaining transparency for end-users.
- KPI (i) - Mean time to provide;
  - KPI (ii) - Fault repair performance;
  - KPI (iii) - Delivery date certainty;
  - KPI (iv) - Time to provide lower percentile limit;
  - KPI (vii) - Time to provide upper percentile limit;
  - KPI (viii) - Mean initial contractual delivery period;
  - KPI (ix) - Monitoring the tail (closed work stack);
  - KPI (xix) - Mean customer caused delay;
  - KPI (xvi) - Changes to contractual delivery dates;
  - KPI (xviii) - Average delay due to contractual delivery date changes; and
  - KPI (xxviii) - Size of the installed base of relevant ethernet services

## KPIs we propose to amend, remove or create

- 15.126 We are proposing to amend, remove, or create KPIs for the reasons listed in the following tables.

Table 15.16: KPIs we are proposing to amend

KPI	Proposal and rationale
<b>KPI (x) – Monitoring the percentile time to provide of the tail extremities</b>	To reduce the scope of this KPI from reporting various percentiles of completed orders (95th to 99.5th) to the percentile of completed orders as defined by the level of the Upper Percentile QoS standard (which we have proposed above is 3% – therefore the corresponding percentile required is 97th)
<b>KPI (xii) – Order validation</b>	To amend the reporting of this KPI from being based on when an order is closed to when an order is accepted/validated, thereby making the metric more relevant to current performance
<b>KPI (xiv) – Performance in issuing initial contractual delivery dates</b>	To amend the reporting of this KPI from being based on the month an order is closed, to being based on the month the iCDD on an order is issued. This will make the metric more relevant to current performance
<b>KPI (xxvi) – Monitoring traffic management Deemed Consent applications</b>	To move from measuring the average proportion of time to provide that relates to traffic management notices (among orders that are subject to traffic management notices), to the proportion of all orders subject to traffic management Deemed Consent <sup>411</sup> codes, and the average number of days delay where a traffic management Deemed Consent code has been applied. This will better measure the complexity of orders
<b>KPI (xxvii) – Monitoring wayleave Deemed Consent applications</b>	To move from measuring the average proportion of time to provide that relates to wayleave applications (among orders that are subject to wayleaves applications), to the proportion of all orders subject to wayleave Deemed Consent codes, and the average number of days delay where a wayleave Deemed Consent code has been applied. This will better measure the complexity of orders

<sup>411</sup> Deemed Consent is a contractual provision allowing Openreach to deem the consent of its customers to a change of the CDD in a range of circumstances as provided for in its contract and without incurring SLG payments for late provision.

Table 15.17: KPIs we are proposing to remove

KPI	Proposal and rationale
<b>KPI (v) – Monitoring the time to provide lower percentile performance</b>	To remove as the ‘Time to provide lower percentile limit’ KPI is sufficient to monitor this issue and we do not consider it necessary for Openreach to provide us with additional detail regarding its performance in delivering easier orders
<b>KPI (vi) – Monitoring the time to provide lower percentile composition</b>	To remove as the ‘Time to provide lower percentile limit’ KPI is sufficient to monitor this issue and we do not consider it necessary for Openreach to provide us with additional detail regarding its performance in delivering easier orders
<b>KPI (xi) – Monitoring the composition of the tail extremities</b>	To remove as this information is obtainable from other metrics
<b>KPI (xiii) – Monitoring the order validation tails</b>	To remove as the ‘Order validation’ KPI is sufficient to monitor this issue and we do not require additional detail regarding order validation tails
<b>KPI (xv) – Performance against the final contractual delivery date</b>	To remove as we do not think the information is useful in monitoring Openreach’s QoS in light of our focus on improving certainty for the initial CDD
<b>KPI (xvii) – Average number of changes to contractual delivery dates</b>	To remove as our focus is on Openreach’s performance in regard to the length of delays (which is provided by the KPI average delay due to CDD changes), rather than the number of changes to the CDD
<b>KPI (xx) – New orders</b>	To remove as this information is obtainable from other metrics
<b>KPI (xxi) – Orders completed</b>	To remove as this information is obtainable from other metrics
<b>KPI (xxii) – Volume of faults</b>	To remove as this information is obtainable from other metrics
<b>KPI (xxiii) – Cablelink mean time to provide</b>	To remove given our proposed reporting criteria for KPIs below now includes separate splits for Cablelink in regard to the areas of the UK where we find SMP

<b>KPI (xxiv) – Order volume forecast from CPs</b>	To remove as we do not think the information is useful in monitoring Openreach’s QoS (this KPI was originally introduced in light of comments from Openreach that it needed forecasts from telecoms providers to allow it to plan for orders, but not all telecoms providers provided forecasts and the quality of forecasts received were mixed) <sup>412</sup>
<b>KPI (xxv) – Order volume forecast by the dominant provider</b>	To remove as this was previously intended to compare Openreach’s forecasts to forecasts that Openreach received from other telecoms providers. As we are proposing to remove the KPI on monitoring order volume forecasts from other telecoms providers, we will no longer need this metric which acts as a base comparison

Table 15.18: KPIs we are proposing to create

<b>KPI</b>	<b>Proposal and rationale</b>
<b>New KPI – Monitoring the tail (open work stack)</b>	While it is still useful to have a KPI on monitoring the tail of more complex orders in regard to past performance (i.e. orders completed/closed), allowing continuity and historical trend of the current metric (as labelled KPI (ix) above), it would also be beneficial to monitor the equivalent metric but based on the current work stack. This will make the metric more relevant to current performance and hence more useful to telecoms providers
<b>New KPI – Mean time to issue the iCDD</b>	We propose a new KPI to provide us with more information about the performance of Openreach in issuing the iCDD, by providing the mean time to issue the iCDD

## Scope of KPIs

15.127 We propose to require KPIs to be provided in all areas of the markets in which we have proposed BT has SMP, including HNR areas where we do not propose to impose QoS standards.

15.128 We propose to require BT to provide KPIs split by the following products:

- EAD, EBD and Cablelink services (and variants) – as BT is currently required to provide and report on;
- WDM – as outlined above, we are proposing to impose KPIs on WDM services to enable us to monitor any differentiation in quality of service; and
- Dark fibre – we propose to require BT to provide KPIs for dark fibre products in the CI Inter-exchange connectivity market, to help inform our understanding of differences in quality of service.

<sup>412</sup> 2016 BCMR, paragraphs 13.331-13.353.

15.129 We have summarised the KPIs we are proposing to require BT to report on, and on what reporting criteria, below.

### Reporting criteria of KPIs

15.130 Under the Temporary Conditions, BT is required to report on most of the KPIs for:

- all parts of the UK in which we found SMP;
- each of the following nations/regions: Scotland; Wales; Northern Ireland; England – North; England – West and England – East;
- the top nine telecoms providers' orders performance;
- each of the applicable provision categories; and
- BT and non-BT telecoms providers' orders performance.

15.131 We propose to continue to require BT to report KPIs on these criteria. However:

- in light of our proposals to impose QoS standards in some but not all geographic areas in the markets where we propose to find SMP, and on some but not all products, we require the reporting of KPIs on QoS standard products/areas;
- in regard to the requirement on BT to report on KPIs for each telecoms provider's orders performance, we propose to reduce this requirement from reporting on the nine largest telecoms providers<sup>413</sup> to the seven largest telecoms providers (as determined by total order volumes, but updated to reflect the current position) to enable us to monitor quality of service provided to the telecoms providers with the largest order volumes; and
- in light of our proposed market definitions, we also propose to require BT to report on KPIs in the separate product markets, as defined above, to enable us to monitor differences in quality of service.

15.132 For a smaller subset of KPIs (those which relate to the performance against the QoS standards), we currently require Openreach to publish these KPIs on its website and update them on a quarterly basis. This provides transparency to end-users and other interested parties as to the performance achieved by Openreach in terms of key aspects of service delivery – namely, how long it takes for Ethernet services to be installed, delivery date certainty and fault repair performance. These reflect the key service issues that we understand are valued by end-users. While we propose to remove the QoS standard in regard to lower percentile, we propose to continue to require Openreach to publish the relevant KPI. Moreover, we also propose to require Openreach to publish its performance against the new KPI we propose to introduce regarding the performance of tail orders, on the basis that visibility of the current workstack for tail orders is likely to benefit telecoms providers.

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<sup>413</sup> Temporary Conditions – Annex 1 (Legal Instruments), Schedule 3, Part 1, 'Relevant Customers'.

15.133 Under the Temporary Conditions, we imposed a requirement on BT to provide, if requested by a telecoms provider, the requesting telecoms provider’s individual performance on a subset of KPIs.<sup>414</sup> However, we understand that Openreach is providing more extensive KPI reports to telecoms providers, and moreover, that the reports required by our regulations are very rarely requested by telecoms providers.<sup>415</sup> Therefore, in line with our duty to consider and ensure our regulation is proportionate, we propose to remove this requirement on BT.

**Table 15.19: Proposed KPIs for UK SMP areas and their reporting criteria**

Area	UK SMP areas			
	Proposed KPI requirement	Total	Split by product	Split by HNR areas or not <sup>416</sup>
a) Mean time to provide	Y	Y	Y	Y*
b) Fault repair performance	Y	Y	Y	Y
c) Delivery date certainty	Y	Y	Y	Y
d) Time to provide (lower percentile)	Y	Y	Y	Y
e) Time to provide (upper percentile)	Y	Y	Y	Y
f) Mean initial contractual delivery period	Y	Y	Y	Y*
g) Monitoring the tail (closed work stack)	Y	Y	Y	Y
h) Monitoring the tail (open work stack)	Y	Y	Y	
i) Time to provide of the tail extremities	Y	Y	Y	Y*
j) Order validation	Y	Y	Y	Y
k) Mean time to issue the initial contractual delivery dates	Y	Y	Y	Y
l) Performance in issuing initial contractual delivery dates	Y	Y		Y

<sup>414</sup> Temporary Conditions – Annex 1 (Legal Instruments), Schedule 3, Part 2, paragraph 6.

<sup>415</sup> Openreach clarifications to Ofcom on KPIs written submission, 14 September 2018.

<sup>416</sup> By HNR areas, we are referring to providing the KPI according to our market definition (i.e. postcode sectors outside the CLA, Metro Areas and the Hull Area).

m) Changes to CDDs	Y	Y		Y
n) Mean delay due to contractual delivery date changes	Y	Y	Y	Y*
o) Mean customer caused delay	Y	Y		Y*
p) Monitoring traffic management Deemed Consent applications	Y	Y		Y
q) Monitoring wayleave Deemed Consent applications	Y	Y		Y
r) Size of the installed base	Y	Y	Y	

Table 15.20: Proposed KPIs for QoS standards products in QoS standards areas and their reporting criteria

Area	QoS standards products in QoS standards areas							
	Proposed KPI requirement	Total	Split by region	Split by RC	Split by PC	Split by BT/non-BT	Split by markets	Num. & den.
a) Mean time to provide	Y (P)	Y (P)	Y	Y	Y	Y	Y	Y*
b) Fault repair performance	Y (P)	Y (P)	Y			Y	Y	Y
c) Delivery date certainty	Y (P)	Y (P)	Y	Y	Y	Y	Y	Y
d) Time to provide (lower percentile)	Y (P)	Y (P)	Y			Y	Y	Y
e) Time to provide (upper percentile)	Y (P)	Y (P)	Y	Y	Y	Y		Y
f) Mean initial contractual delivery period	Y	Y	Y	Y	Y	Y		Y*
g) Monitoring the tail (closed work stack)	Y	Y	Y	Y	Y	Y		Y
h) Monitoring the tail (open work stack)	Y (P)	Y	Y	Y	Y	Y	Y	

i) Time to provide of the tail extremities	Y	Y		Y			Y*
j) Order validation	Y		Y		Y		Y
k) Mean time to issue initial contractual delivery dates	Y		Y	Y		Y	Y
l) Performance in issuing initial contractual delivery dates	Y		Y				Y
m) Changes to CDDs	Y		Y			Y	Y
n) Mean delay due to contractual delivery date changes	Y		Y	Y	Y	Y	Y*
o) Mean customer caused delay	Y		Y	Y			Y*
p) Monitoring traffic management Deemed Consent applications	Y	Y		Y			Y
q) Monitoring wayleave Deemed Consent applications	Y	Y		Y			Y
r) Size of the installed base	Y	Y	Y			Y	

Notes for Tables 15.19 and 15.20 are set out in the following paragraphs.

15.134 “Y” in a column means yes, the KPI is required and must be provided as indicated by the column headings in the following ways:

- “UK SMP” means for the following reporting criteria, the KPI should be provided for the following column headings for Ethernet, WDM and Dark Fibre products, for all areas of the UK where we have found BT to have SMP (i.e. excluding the CLA and Hull Area);
- “Total” means the KPI must be provided (as one figure) for the whole of the areas of the UK where we find BT to have SMP (i.e. excluding the CLA and Hull Area); and
- “Split by product” means the KPI must be provided for each of the following products:
  - EAD (including EAD LA);
  - EBD;
  - Cablelink;
  - WDM; and

- Dark fibre.
  - “Split by HNR areas or not” means the KPI must be provided for the areas which we have determined as HNR including Metro areas, or not.
- 15.135 “QoS standards products in QoS Standards areas” means for the following reporting criteria, the KPI should be provided for the following column headings for Ethernet (in year one and year two) and dark fibre products (in year two), for all areas of the UK where we have determined QoS standards apply:
- “Total” means the KPI must be provided (as one figure) for the areas of the UK where we determine QoS Standards apply;
  - “Split by region” means the KPI must be provided for each of the following nations/regions: Scotland; Wales; Northern Ireland; England – North; England – West and England – East;
  - “Split by RC” (relevant customer) means the KPI must be provided for each telecoms providers’ orders<sup>417</sup>;
  - “Split by PC” means the KPI must be provided for each of the applicable provision categories;
  - “Split by BT / non-BT” means the KPI must be provided separately for an aggregate of BT businesses that are downstream customers of Openreach and for an aggregate of all other telecoms providers that are downstream customers of Openreach
  - “Split by markets” means the KPI must be provided for each of the following markets;
    - Non-competitive BT exchanges in the CI Inter-exchange connectivity market
    - CI Access services market, BT Only areas
    - CI Access services market, BT+1 areas
- 15.136 “(P)” adjacent to a Y means the KPI must be made publicly available, split according to the column heading, by means of publication on an Openreach website on a quarterly basis.
- 15.137 “Num. & den.” mean numerator and denominator respectively. For the average values (marked as \*), we require for each month the numerator representing the sum of the product of the time values (or number of changes) and the quantities of product exhibiting that time values (or number of changes) while for the denominator we require the volume of products over which the average is taken.

## Service level agreements and service level guarantees

- 15.138 As we have discussed above, SLAs and SLGs are one of the three tools we propose to use to encourage Openreach to provide an appropriate level of quality of service.
- 15.139 SLAs set out Openreach’s commitment to provide services to an agreed quality, e.g. the target time to undertake a repair or installation. SLGs specify the level of compensation that the telecoms provider would be entitled to should the service not be provided to the

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<sup>417</sup> This applies to the top seven telecoms providers in terms of order volumes, with the remainder combined into an ‘Other’ category.

quality specified in the SLA, e.g. if delivery of the service was late. They are intended to reflect a pre-estimate of the average costs to a telecoms provider of breaches of the quality obligations specified in the SLAs. SLAs and SLGs are set in contracts agreed between Openreach and telecoms providers but can be influenced by regulation.

## Current regulation

- 15.140 In the 2016 BCMR and Temporary Conditions we required that BT publish a Reference Offer for its wholesale leased line products which set out its SLAs and SLGs. We also issued a direction under the quality of service SMP condition specifying the SLG compensation arrangements for the wholesale Ethernet services BT provides to its customers. The direction applied the principles established in our 2008 SLG Statement.<sup>418</sup>
- 15.141 The SLG Direction requires that BT's terms and conditions for the supply of wholesale Ethernet services include the following:
- obtain consent from the telecoms provider to set a CDD of greater than 57 days;
  - pay compensation at 100% of one month's line rental per day up to 60 days for orders not delivered by the CDD or the Customer Requirements Date (whichever is later);
  - pay compensation at 15% of one month's line rental per hour up to 200 hours for faults not repaired within five hours; and
  - pay SLG compensation payments proactively and without prejudice to any right of telecoms providers to claim for additional losses.

## Our proposals

- 15.142 In line with the approach adopted in the 2017 NMR<sup>419</sup> and the 2018 WLA, we propose to remove the SLG Direction, and instead to include elements of it in BT's RO conditions.
- 15.143 The original purpose of the SLG Direction was to require BT to make certain amendments to its contracts following our 2008 review of wholesale Ethernet SLAs and SLGs. Those amendments are now established in BT's contractual agreements for the supply of the relevant wholesale products. The contractual arrangements for SLAs and SLGs will continue to apply unless changes are agreed, subject to the negotiation principles set out below. These principles are designed to provide a structured and open process for SLG negotiations, that takes account of the likely imbalance in negotiating positions as between Openreach and its customers. Consequently, we consider that it is not necessary to continue to specify the Ethernet SLAs and SLGs in such detail.
- 15.144 Moreover, Openreach is currently engaged in discussions with telecoms providers about changes to the Ethernet provisioning processes, SLAs and SLGs. Some of the changes under discussion (such as removing the use of Deemed Consent to amend contractual delivery dates and changes to the level of SLG compensation) might not be consistent with the

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<sup>418</sup> *Service level guarantees: incentivising performance*,  
[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0020/33617/statement.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0020/33617/statement.pdf)

<sup>419</sup> Ofcom, 2017. *Narrowband Market Review: Statement*.  
[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0020/108353/final-statement-narrowband-market-review.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0020/108353/final-statement-narrowband-market-review.pdf)

detailed specification of provisioning SLA/SLGs in the SLG Direction. We would need to consult on any future amendment to the SLG Direction, so retaining it in its current form risks delaying implementation of any changes which might be agreed.

15.145 We therefore propose to include certain requirements in the reference offer condition for Ethernet services in the wholesale CI markets. As discussed in Section 11, those requirements are:

- an obligation to have SLAs and SLGs for completion of the provision of service;
- an obligation to have SLAs and SLGs for fault repair;
- an obligation to pay SLGs proactively; and
- a requirement that any SLG compensation shall be without prejudice to the rights of either party to claim for additional losses.

15.146 These changes would mean that BT would no longer be required to:

- obtain consent from the telecoms provider to set a CDD of greater than 57 days;
- pay compensation at 100% of one month's line rental per day up to 60 days for orders not delivered by the CDD or the Customer Requirements Date (whichever is later); and
- pay compensation at 15% of one month's line rental per hour up to 200 hours for faults not repaired within five hours.

15.147 Similar to our proposed approach to Ethernet services, and as we explain in Section 12, we propose the reference offer condition for dark fibre access should include an obligation for BT to have SLAs and SLGs for the completion of the provision of the service and fault repair times.

## SLA and SLG negotiation principles

15.148 In our 2014 FAMR<sup>420</sup> and 2016 BCMR, we adopted contract negotiation principles and SLA/SLG assessment criteria to be applied to future industry negotiations in relation to SLAs/SLGs. These were among measures we put in place to ensure that BT maintains its quality of service in the supply of wholesale network access services (provided pursuant to our WLR, LLU and wholesale Ethernet leased line SMP remedies).

15.149 We consider that the rationale for adopting principles for contract negotiation in previous reviews is applicable over the period of our current market reviews. Furthermore, we believe that the application of these principles and criteria has, thus far, worked well in relation to wholesale Ethernet services (as discussed below the recent negotiations were productive, notwithstanding the lack of agreement on certain points) and also in relation to the supply of WLR, MPF and GEA services.

15.150 We therefore believe that the same principles and criteria should continue to apply to future contract negotiations between Openreach and its customers in relation to

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<sup>420</sup> Ofcom, 2016. *Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30*. [https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0032/78863/volume1.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0032/78863/volume1.pdf).

SLAs/SLGs for the provision of wholesale Ethernet leased lines and form part of our proposed package of remedies to address the QoS concerns discussed in this section.

15.151 In this sub-section we:

- reprise the reasoning for adopting contract negotiation principles and SLA/SLG assessment criteria;
- specify the relevant principles and criteria and related matters which we are proposing should apply to future contract negotiations between Openreach and its customers in relation to SLAs/SLGs for the provision of wholesale Ethernet leased lines; and
- set out why we consider that it is appropriate to adopt these principles and criteria as part of the package of remedies we are proposing to address our QoS concerns in this market review.

### **Reasoning for the adoption of contract negotiation principles and SLA/SLG assessment criteria**

15.152 In response to concerns raised by telecoms providers about the process for industry negotiations when Openreach or telecoms providers consider that existing terms should be changed or that Openreach should provide new SLAs/SLGs for an element of a service, we recognised that Openreach, as the SMP provider for services in fixed access markets, naturally holds a more powerful negotiating position than other telecoms providers.

15.153 In our view, where all parties are negotiating from a broadly similar position of market power, commercial negotiation without the involvement of the industry regulator is the preferred method for reaching agreement on the terms of SLAs and SLGs.

15.154 In recognition of the likely imbalance in negotiating positions as between Openreach and its customers, we have concerns about the predictability and visibility of the process that determines critical aspects of SLA/SLG terms.

15.155 While maintaining that regulatory intervention should be the last resort, we consider that there should be a defined, structured and open process for the negotiation of SLA/SLG terms which reserved a central role for the OTA2 and set a time limit for negotiations.

### **Principles for the contract negotiation process and criteria for the assessment of SLA/SLG requests**

15.156 We consider that the principles set out in Table 15.21 and the criteria set out in Table 15.22 should apply to future contract negotiations between Openreach and its customers in relation to SLAs/SLGs for the provision of wholesale Ethernet leased lines.

15.157 These principles and criteria are the same as those set out in the 2016 BCMR.

**Table 15.21: Principles for the contract negotiation process**

Principle	Description
<b>Principle 1</b>	The OTA2 should facilitate all negotiations to create or change an SLA/SLG and that this negotiation will allow input from all affected parties.
<b>Principle 2</b>	The OTA2 will, using stated criteria, assess whether a request for negotiations on a new SLA/SLG or change to an existing SLA/SLG (and related contract terms) should be facilitated through this negotiation process.
<b>Principle 3</b>	No negotiations over the content of an SLA/SLG should extend beyond six months, with regular reporting to Ofcom. If, in the opinion of the OTA2, negotiations cannot be successfully concluded or have not been concluded within six months, then the OTA2, as part of its final report to Ofcom, will set out its view on whether and on what basis Ofcom should initiate a review.
<b>Principle 4</b>	Provision should continue according to the terms of an appropriate, pre-existing SLA/SLG until such time as a new SLA/SLG can be agreed.
<b>Principle 5</b>	The OTA2 should facilitate all negotiations to create or change an SLA/SLG and that this negotiation will allow input from all affected parties.

### Principles 1 and 2 – the role of the OTA2 and practical application

- 15.158 We envisage that the OTA2's role will be to facilitate the negotiation process, rather than to make decisions. However, we consider that there is significant scope for the OTA2 to contribute to, as well as guide and structure, the negotiation process and to assist in ensuring that parties are able fully to participate.
- 15.159 We would expect that the OTA2 would also have a key role in prioritising the issues to be considered in the process. This could mean that the OTA2 would decide that an issue is not appropriate for consideration in the process. This would not, of course, prevent any stakeholder from raising this issue as a dispute directly with Ofcom, but would ensure that what would be a resource-intensive process is used effectively.
- 15.160 We propose that the initial criteria used by the OTA2 for making its assessment of SLA/SLG requests under Principle 2 are those set out in Table 15.22 below. While these criteria may need to be adapted over time, we propose that they form a reasonable basis for decisions as to prioritising issues for review.

**Table 15.22: Criteria for the assessment of SLA/SLG requests**

Criterion	Description
<b>Criterion 1</b>	The request does not duplicate an existing request that is either being considered by the OTA2 or is under discussion within an existing industry forum.
<b>Criterion 2</b>	The request could provide an adequate material benefit for the telecoms provider or industry and that any negative impact of the request not being addressed cannot be easily mitigated without the reasonable support of Openreach.

- |                    |  |
|--------------------|--|
| <b>Criterion 3</b> | The request does not seek to address a telecoms providers deficiency that should more appropriately be addressed by the telecoms provider(s) themselves.             |
| <b>Criterion 4</b> | The request has adequate scale and support across industry or from those telecoms providers addressing a recognised end customer group to which the request relates. |

### Principle 3 – Time limits for negotiation and clarifying/amending the subsequent process

- 15.161 We consider that six months is an appropriate period in which to allow negotiations to take their course, where it is clear they are progressing. However, where negotiations have clearly broken down, then the OTA2 need not wait for the full six-month period to elapse before providing its report to Ofcom.
- 15.162 Principle 3 provides that: (i) the OTA2 will be actively reporting to Ofcom on the progress of negotiations, including setting out its view on whether and on what basis Ofcom should initiate a review; and (ii) after receiving this report, we will consider the matter on its merits. We cannot commit (in the principles) to a full investigation or to invite parties to raise disputes without considering the facts of each specific case first. While we will need to take an independent view of the issues, we will take appropriate account of the OTA2's report, which we expect will include details about the contribution of all participants, including their role in any delays to negotiations.

### Principle 4 – Clarifying the date when new SLAs/SLGs take effect

- 15.163 We consider that the backdating of SLAs/SLGs may risk distorting any negotiation process. It could lead to a disproportionate focus on performance in that period and may act to discourage Openreach from engaging positively with the proposed changes, as Openreach would not have an opportunity to modify its behaviour in response to the new targets and any compensation payments. We also consider that our principle that 'provision should continue according to the terms of an appropriate, pre-existing SLA/SLG until such time as a new SLA/SLG can be agreed' provides sufficient clarity as to the time at which the new SLA/SLG would take effect, i.e. on its agreement.

### Negotiating behaviours and references to Ofcom under the principles

- 15.164 We would expect all parties to any such negotiations (including Openreach) to make all reasonable efforts to exhibit the following behaviours:
- to approach negotiation of these matters with professional courtesy and an openness and willingness to consider the issues raised and any evidence presented;
  - to be responsive to requests for negotiation and dialogue in a timely manner;
  - to ensure that suitably empowered staff are available for meetings within a reasonable period following a request; and
  - to ensure that requests for information are responded to as quickly as reasonably possible.

- 15.165 If Openreach does not engage in a manner we consider appropriate, then we may consider whether there is a need for additional regulatory conditions (to be imposed either as part of future market reviews or at another time) which impose a process for negotiation in such circumstances.
- 15.166 If an issue is referred to us under these arrangements, we will need to consider what is appropriate, including whether an issue/range of issues warrants our intervention. In addition to considering any such issues under our dispute resolution powers, it may also be necessary to consider whether a broader intervention might be required through, for instance, an own initiative compliance investigation or a policy review. Any decision about intervention will be based on our assessment of the issues referred to us in light of our duties and the broader regulatory framework. In the context of any such considerations, we would also consider any advice that the OTA2 offers in its final report, as appropriate.
- 15.167 In relation to the proposed arrangements, where an issue is referred to us and we consider that it is appropriate to intervene, our starting point will be the respective proposals of each of the parties. In the first instance, we would expect to consider whether it would be appropriate, in light of our duties and the broader regulatory framework, to choose between these proposals, rather than seek to consider other alternative options in detail. This would be intended to create the incentive for parties to set out their most reasonable final positions, rather than taking an extreme position to try to distort any eventual regulatory outcome in their favour. However, such an approach remains subject to the overall requirement to adopt an outcome which overall best meets our statutory duties.

## The Ethernet SLA and SLG negotiations

- 15.168 Following the 2016 BCMR, in July 2016, Openreach commenced negotiations concerning changes to the SLAs and SLGs for wholesale Ethernet services. In addition to Openreach there were five participants: TalkTalk, Vodafone and the BT downstream businesses (BT Wholesale and Ventures, BT Global Services, and BT Public Sector). The negotiations were facilitated by the OTA2 and were conducted in accordance with the SLA/SLG negotiation principles described above.
- 15.169 In January 2018, after consultation with Openreach and the other participants, the OTA2 notified us that the negotiations had been unsuccessful. The OTA2 concluded that given the opposing positions on certain topics, it was unlikely that further negotiations would be successful. Moreover, participants other than Openreach did not wish to reopen negotiations and two considered that Ofcom should review the role of SLGs as part of the BCMR.

## Summary of the negotiations

### Service level agreements

- 15.170 The first phase of the negotiations concerned the SLAs that should apply to Ethernet provisioning. The negotiations were successfully completed in September 2016. Participants agreed that:

- the main provisioning SLA would be aligned with the measure of provisioning performance used by Ofcom for the QoS standards. The SLA would therefore continue to apply to the completion of orders by the CDD, but the use of deemed consent would be limited to customer delays, MBORC and other cases explicitly agreed by telecoms providers;<sup>421</sup>
- the main provisioning SLA would be extended to include the delivery of handover documentation (i.e. failure to provide the handover document would constitute a failure for SLA purposes);
- there would be a separate SLA to cover cases where remedial work is required after a circuit has been handed over by Openreach;<sup>422</sup> and
- the same SLG rate would apply to both SLAs.

### Service level guarantees

- 15.171 The second phase of the negotiations concerned the level of the SLGs and was unsuccessful.
- 15.172 In relation to the types of costs (arising because of Openreach provisioning failures), participants agreed that the SLGs should include an allowance for:
- delayed revenue margin;
  - cancelled orders; and
  - delay management (the customer service costs relating to delays).
- 15.173 The participants disagreed on whether the SLGs should also include an allowance for:
- compensation to downstream customers – [REDACTED], [REDACTED] and [REDACTED] considered that the SLGs should include a pre-estimate for the compensation paid to downstream customers in connection with Openreach provisioning failures. [REDACTED] considered that such losses should be excluded from SLG calculation as they are not normally included in commercial contracts; and
  - brand/reputational damage – [REDACTED] and [REDACTED] considered that the SLGs should include a pre-estimate for the brand/reputational damage arising because of Openreach provisioning failures. [REDACTED] considered that brand/reputational damage should be excluded from the SLG calculation as it is not normally included in commercial contracts. [REDACTED] considered that such losses are intangible.<sup>423</sup>
- 15.174 There were also significant differences between the SLG proposed by Openreach and other participants. For simplicity, SLG payments were discussed in terms of the average SLG payment for Ethernet circuits of all bandwidths:

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<sup>421</sup> In practical terms, this change would mean that a greater proportion of delays would be allowable for SLG payments.

<sup>422</sup> The detailed specification of this SLA was not discussed.

<sup>423</sup> Ofcom summary drawn from the OTA2 SLG negotiation closure report to Ofcom, 29 January 2018 and telecoms providers submissions to the OTA2, provided to Ofcom by the OTA2, 22 May 2018.

- Openreach proposed a dual rate SLG with an average payment of £53 per day with an inflection point at 21 days. This proposal was based on a model of telecoms provider costs, which indicated that delay management costs and the propensity (of end-users) to cancel would be higher for longer delays; and
- the OTA2's consolidated view of the other participants estimates of their SLG costs<sup>424</sup> was £165 per day using the current SLA definition and £103 after applying Openreach's cost neutral adjustment for the proposed SLA definition.<sup>425 426</sup>

15.175 For comparison, Openreach estimated that the average SLG payment under the current SLG arrangements, adjusted for the proposed SLA definition, was £76 per day.

15.176 The OTA2 found that the differences between the Openreach proposal and their consolidated view of other participants' estimates was due principally to two factors. These were:

- the brand/reputational loss estimate in two participants' submissions, which was the principle influencing factor; and
- the estimate for additional senior management costs in one participant's submission.<sup>427</sup>

## Our considerations

15.177 The OTA2's view is that the negotiations were productive even though they were ultimately unsuccessful. We support this view. Participants appear to have developed a better understanding of their costs relating to Openreach provisioning failures since the 2016 BCMR. There also appears to be a measure of agreement on the level of some types of cost.

15.178 In accordance with the negotiation principles discussed above, we have considered how best to proceed in light of the OTA2's referral of the negotiations to us.

15.179 We have considered firstly, whether it would be appropriate, in light of our duties and the broader regulatory framework, to choose between the participants' proposals for the level of the Ethernet provisioning SLGs, rather than seek to consider other alternative options in detail. We have concluded that this would not be appropriate because:

- there are significant differences between the participants estimates for some cost types and there is insufficient detail in some of their submissions to the OTA2 for us to judge which to choose;
- the participants also differ on points of principle; and

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<sup>424</sup> The OTA2 weighted contributions according to each participant's share of circuit volumes and adjusted for non-participating telecoms providers.

<sup>425</sup> SLG payments were reduced to reflect the increase in the average number of allowable SLG days from [REDACTED] to [REDACTED] days.

<sup>426</sup> Ofcom summary drawn from the OTA2 SLG negotiation closure report to Ofcom, 29 January 2018 and telecoms providers submissions to the OTA2, provided to Ofcom by the OTA2, 22 May 2018.

<sup>427</sup> Ofcom summary drawn from the OTA2 SLG negotiation closure report to Ofcom, 29 January 2018 and telecoms providers submissions to the OTA2, provided to Ofcom by the OTA2, 22 May 2018.

- as discussed in more detail below, we consider that it may be useful to update some of the cost estimates.
- 15.180 We therefore consider that prior to making any changes to the level of the Ethernet provisioning SLGs, we would need to undertake a more wide-ranging review and to gather further evidence from the participants. Such an exercise would inevitably take some time, particularly as we would have to consult on any proposals we make following the review.
- 15.181 We are also mindful that in July 2018, Openreach notified the OTA2 and other telecoms providers that it wishes to negotiate changes to its Ethernet contract to support wide ranging changes to its provisioning processes.<sup>428</sup> Among other things, these changes are designed to improve delivery date certainty by enabling Openreach to set more accurate contractual delivery dates from the outset, and to eliminate the use of deemed consent to amend CDDs. As part of these negotiations, Openreach also wishes to recommence negotiations on the Ethernet SLAs and SLGs.
- 15.182 There is a risk that any review we might undertake could interfere with these new negotiations, as telecoms providers might wish to wait for the outcome of our review before concluding negotiations on changes to the Ethernet contract. Conversely there is a risk that the negotiations might lead to changes to the Ethernet SLAs which would need to be considered in our review.
- 15.183 We therefore propose to give guidance on the key points of disagreement about the Ethernet SLGs identified by the OTA2 with the objective of helping the participants to reach agreement during the forthcoming negotiations.
- 15.184 If the forthcoming negotiations are again unsuccessful and are referred to us by the OTA2, we would consider how best to proceed in accordance with the negotiation principles.

## **Our proposed guidance on the key points of disagreement in the SLG negotiations**

- 15.185 Here we set out our initial consideration of the negotiations between Openreach and industry and the most pertinent points of discussion. While not determinative in the event of any future referral to Ofcom, and we would consider all evidence presented to us in those circumstances, we set out initial considerations below to assist parties in reaching an expeditious agreement.

### **Types of costs which should be included in the SLG calculation**

- 15.186 We note firstly that the SLGs are a matter of negotiation and it is therefore open to participants to agree what types of cost should be included in the SLG calculation.
- 15.187 If we are asked to consider which types of cost should be included in the SLG calculation our starting point would be the 2008 SLG Statement which established the first principles for SLGs. This states that when Openreach fails to meet agreed service levels, it should pay

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<sup>428</sup> Openreach subsequently published a consultation on its proposals, *Re-imagining Ethernet Provision*, 26 September 2018.

telecoms providers compensation which is based on a pre-estimate of an average telecoms provider's loss resulting from that failure. We remain of the view that this principle is appropriate given that Openreach's wholesale Ethernet services are SMP services.

15.188 In accordance with this principle, we would therefore be likely to consider that including pre-estimates of compensation to end-users and damage to brand/reputation could be appropriate provided that:

- there is evidence that telecoms providers incur such costs in practice; and
- the allowance for such costs is a genuine pre-estimate of those losses.

### Brand/reputational damage

15.189 [X] and [X] estimate that Openreach provisioning failures lead to a significant incidence of brand/reputational damage in the form of lost future business. [X], for example, estimates that [X].<sup>429</sup>

15.190 We have not seen the underlying evidence supporting these estimates, so we are unable to give a definitive view, however, we would question high estimates for several reasons:

- Ethernet services are typically purchased by businesses. In most circumstances these end-users would understand Openreach's role in delays and would understand that they affect all suppliers that use Openreach rather than impacting on one brand;
- telecoms providers should be able to mitigate reputational damage by handling delays professionally e.g. by keeping end-users apprised of developments and by organising projects to minimise dependence on individual circuits; and
- a proportion of Ethernet circuits will be purchased for internal usage (e.g. for use as backhaul circuits) and would be much less likely to affect end-users directly.

15.191 Consequently, it would appear to us that losses arising from brand/reputational damage are likely to be the exception rather than the rule. Our research with end-users for the 2016 BCMR tends to support this view. The research found that only 38% of respondents (business and public sector users of leased lines) had ever switched suppliers for their leased line services.<sup>430</sup> End users would be likely to switch suppliers for a variety of reasons so the incidence of switching due to brand/reputational damage would be much lower than this figure.

15.192 We therefore initially consider that the brand/reputational damage estimates would warrant further examination with particular focus on the extent to which such harm occurs in practice.

### Delay management costs

15.193 [X] estimate of delay management costs was significantly higher than those of other participants, principally due to its estimate of the management costs of dealing with

<sup>429</sup> Ofcom summary drawn from the OTA2 SLG negotiation closure report to Ofcom, 29 January 2018, OTA2 SLG model and telecoms providers submissions to the OTA2, provided to Ofcom by the OTA2, 22 May 2018.

<sup>430</sup> Ofcom, 2015. *Quality of service: leased lines 2014*, section 5.8.1.

[https://www.ofcom.org.uk/\\_data/assets/pdf\\_file/0023/58721/qos\\_report\\_27th\\_april.pdf](https://www.ofcom.org.uk/_data/assets/pdf_file/0023/58721/qos_report_27th_april.pdf).

delayed orders (as distinct from other delay management activities such as customer service costs).

- 15.194 We have not seen the source data and calculations supporting the estimate, however we note that:
- at £[Redacted] per order, this management element appears to be very high both in absolute terms and in relation to wholesale Ethernet charges;
  - the estimate was based on an analysis of orders that missed their contractual delivery dates between July and December 2016. It therefore relates to a period shortly after the imposition of the QoS standards when Openreach was taking steps to improve provisioning performance and performance was still comparatively poor.<sup>431</sup>
- 15.195 It appears probable that the management costs may be a function of the poor Openreach provisioning performance at the time and therefore may not be representative of the costs that telecoms providers incur now that performance has improved.
- 15.196 More generally, we note that most participants are likely to have based their estimates on information relating to 2016 when Openreach's provisioning performance was significantly lower than at present and may therefore benefit from updating to reflect current costs.

## Impact of proposed QoS standards on Openreach resources

### Impact on charge control

- 15.197 Given that we are proposing a cap at current prices on Ethernet services, there is no direct impact from our QoS proposals on the charge control. Further, in light of the relatively limited changes that we are proposing to the QoS standards, it is likely that Openreach can deliver them without incurring significant additional costs.<sup>432</sup>

## Legal tests

- 15.198 Here, we set out why we provisionally consider that the SMP condition we propose to set and the directions we propose to make in connection with it satisfy the tests set out in the Act, and are in accordance with our legal duties. In particular, we set out why we provisionally consider:
- the SMP condition proposed in relation to QoS standards and KPI reporting is authorised under section 87 of the Act;
  - the proposed SMP condition fulfils the tests in section 47 of the Act;
  - the directions we propose to make under the SMP condition fulfils the test in section 49 of the Act;

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<sup>431</sup> Ofcom summary drawn from the OTA2 SLG negotiation closure report to Ofcom, 29 January 2018, OTA2 SLG model and telecoms providers submissions to the OTA2, provided to Ofcom by the OTA2, 22 May 2018.

<sup>432</sup> We have considered the impact of our revised QoS proposals on SLG payments as part of the analysis supporting our charge control proposals in Annexes 18 and 19.

- both the proposed SMP conditions and proposed directions have been formulated in compliance with our relevant statutory duties, particularly those under sections 3 and 4 of the Act; and
- both the proposed SMP conditions and proposed directions take utmost account of EC Recommendations and the BEREC Common Position.

## SMP condition

- 15.199 Section 87(3) of the Act authorises the setting of SMP conditions in relation to the provision of network access. Section 87(5) of the Act provides that such conditions may include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded to, and for securing that the obligations contained in the conditions are complied with within the periods and at the times required by or under the conditions.
- 15.200 In this regard, we note that Article 12(1) of the Access Directive provides that national regulatory authorities may attach to conditions relating to network access obligations covering fairness, reasonableness and timeliness. Section 87(6)(b) of the Act also specifically authorises the setting of SMP conditions which require a dominant provider to publish, in such a manner as Ofcom may direct, all such information for the purposes of securing transparency.
- 15.201 We provisionally consider that the proposed SMP condition will enable Ofcom to secure that network access is provided within a reasonable period and on a fair and reasonable basis.
- 15.202 We have taken into account the factors set out in section 87(4) of the Act. In particular, we consider that the proposed imposition of a condition enabling Ofcom to set QoS standards is necessary to ensure an appropriate level of quality of service so as to secure effective competition, including economically efficient infrastructure-based competition, in the long term. Our proposed condition will also ensure that there can be an appropriate level of transparency in relation to quality of service, by requiring BT to publish such information as to the quality of its services as Ofcom may from time to time direct.
- 15.203 Section 47(2) requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. In our view, the proposed SMP condition is:
- objectively justifiable: the purpose of the regulation is to ensure mandatory QoS standards in relation to some key services supporting network access, and to allow Ofcom and the industry to monitor BT's QoS via published KPIs. In the absence of other effective incentive mechanisms, we consider regulation is necessary to secure an appropriate level of service by BT, and our regulation addresses this;
  - not unduly discriminatory: it will only apply to BT because we have identified it as the only telecoms provider having SMP in the relevant markets in the UK, excluding the Hull Area;

- proportionate: having identified the need for regulation of BT's quality of service and for information to be made available about performance, we consider our proposals are the least onerous means of achieving the desired objective; and
  - transparent: the clear intention of the proposed SMP condition is to ensure that BT maintains a level of quality of service, and does not discriminate unduly, in relation to key factors of importance to customers.
- 15.204 We have considered our duties under Section 3 of the Act. We consider that, by ensuring that BT adheres to prescribed QoS standards and transparency requirements, our proposals will further the interests of citizens in relation to communications matters and further the interests of consumers in relevant markets by promoting competition.
- 15.205 We have considered the Community requirements set out in Section 4 of the Act. We consider that these conditions will promote competition in relation to the provision of electronic communications networks and encourage the provision of network access for the purposes of securing efficient and sustainable competition in the markets for electronic communications networks and services.

## Directions

- 15.206 We also consider that the proposed directions meet the criteria in section 49(2) of the Act. In our view, the proposed directions are:
- objectively justifiable: they aim to ensure that BT provides adequate levels of QoS in relation to services in markets where BT has SMP and where we have identified a risk that QoS standards not being maintained in the absence of regulations. For the reasons set out in this document, we consider the particular standards in the direction cover the appropriate services and are at an appropriate level in light of that aim. In relation to KPIs, transparency allows us and industry more broadly to discern any trends in performance that may require intervention, and any potential discrimination.
  - not unduly discriminatory: the proposed directions will only apply to BT because we have identified it as the only telecoms provider having SMP in the relevant markets in the UK, excluding the Hull Area;
  - proportionate: the proposed directions target only those areas for which regulation is required. We consider that the directions are a proportionate means of achieving the objective of ensuring an appropriate level of service, taking into account our assessment of BT's operational capabilities, the challenges that exist in securing further improvements, and potential costs to customers and telecoms providers. They also make appropriate allowance for the fact that delays differ in the extent to which they are within BT's control. In relation to transparency, we have considered whether all KPIs are required and have removed or modified some to ensure the regulatory burden imposed is no greater than is proportionate to the issues identified; and
  - transparent: the clear intention of the proposed directions is to ensure that BT maintains an appropriate level of quality of service (and transparency regarding the same) in relation to matters of importance to customers. In addition, our directions are clear in setting out the QoS standards and KPIs that we are proposing to impose.

15.207 We consider that the directions meet our duties in the Act, including our general duties under Section 3 and all the Community requirements set out in Section 4 of the Act. In particular, the directions are aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by ensuring that BT provides an improved level of performance in key areas of importance to its customers. In relation to KPIs, the proposed directions provide visibility to customers about BT's performance in services in the markets covered by the BCMR, upon which they in many cases rely.

### **The BEREC Common Position and EC Recommendation on non-disclosure obligations**

15.208 In relation to the BEREC Common Position, we note in particular that it identifies, among other things, as best practice that national regulatory authorities should require SMP operators to provide a reasonable defined level of service (BP32) to address the concern that access services may not be of reasonable quality and service levels may not be comparable with those provided by the SMP operators to their own downstream businesses. We also note that BP27 and BP34 relate to the objectives of achieving transparency and a reasonable quality of access services. We have taken utmost account of the BEREC Common Position, and particularly have reflected the aforementioned elements.

15.209 We have also taken utmost account of the EC Recommendation on consistent non-discrimination obligations.<sup>433</sup> This states that, when imposing a non-discrimination obligation under Article 10 of the Access Directive, national regulatory authorities should impose on the SMP operator the use of KPIs to monitor effectively compliance with non-discrimination obligations. In particular, it says KPIs should:

- measure performance at least in relation to the following: (i) ordering process; (ii) provision of service; (iii) quality of service, including faults; (iv) fault repair times; and (v) migration between different regulated wholesale inputs;
- allow for comparison of services provided internally and externally by the SMP provider;
- be published in a manner that allows for early discovery of potential discriminatory behaviour; and
- be regularly audited by the national regulatory authority or an independent auditor.

15.210 The Recommendation also says national regulatory authorities should take account of existing performance measures in imposing KPIs and, where the results of the KPIs indicate that the SMP operator may not comply with its non-discrimination obligation, intervene by investigating the matter in more detail and, where necessary, enforcing compliance.

15.211 We consider that our conditions are consistent with these principles. KPIs will continue to be either openly published or available to Ofcom for review. They cover all the key

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<sup>433</sup> EC, 2013. Commission recommendation of 11 September 2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment, 11 September 2013, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:251:0013:0032:En:PDF>

elements of service provision and allow for comparison between internal and external customers. They take account of existing performance measures, and we have indicated a willingness to intervene if necessary if KPIs indicate a problem. We maintain an active programme of monitoring KPIs. We continue to consider that formalised regular audits of KPIs imposed under the SMP framework would be disproportionate, although this is something which we keep under review.

## Consultation question

Question 15.1: Do you agree with our proposals regarding the application of QoS standards, KPIs, SLAs and SLGs over the period of this review? Please provide evidence to support your views.

## 16. Remedies in the Hull Area

- 16.1 This section outlines our proposed remedies in the market for wholesale CI Access services at all bandwidths in the Hull Area, in which we have provisionally identified KCOM as having SMP (as discussed in Section 9).
- 16.2 In light of our provisional assessment that KCOM has SMP in the wholesale CI Access market in the Hull Area, we are concerned that, in the absence of appropriate *ex ante* regulation:
- KCOM would have the incentive and ability to refuse to provide access to its network or not provide access on terms that would secure efficient investment and innovation, both in the relevant wholesale market and the related downstream retail markets;
  - KCOM would have the incentive and ability to favour its downstream retail businesses to the detriment of its competitors in the relevant retail markets, including by price and non-price discrimination; and
  - KCOM would have the incentive and ability to fix and maintain some or all of its CI Access prices at an excessively high level or engage in a price squeeze.
- 16.3 In this section, we set out in more detail why we consider that each of our proposed remedies will help to address the competition concerns we have identified. As set out in Article 8(4) of the Access Directive, our package of *ex ante* remedies must be based on the nature of the competition problems identified and must be proportionate and justified in light of the objectives laid down in Article 8 of the Framework Directive.
- 16.4 We propose the following remedies:
- requirement to provide network access on reasonable request and on fair and reasonable charges, terms and conditions;
  - requirement not to discriminate unduly;
  - requirement to publish an RO, including charges, terms and conditions;
  - requirement to notify changes to charges, terms and conditions;
  - requirement to notify changes to technical information;
  - requirement to produce a Pricing Transparency Report (PTR);
  - cost accounting; and
  - accounting separation.
- 16.5 The proposed remedies listed above are substantially the same as those that currently apply to these services, with the following exceptions:
- a requirement for additional information in KCOM's PTR to enable us to match KCOM's prices with the specific prices set out in its RO; and
  - introduction of a remedy for cost accounting.
- 16.6 We set out for each of the proposed remedies:
- current regulation;
  - aim and effect of proposed regulation;
  - our proposals; and

- legal tests.

16.7 KCOM is currently also subject to remedies in the retail market for CI leased lines in the Hull Area, and in the wholesale and retail markets for low bandwidth TI leased lines in the Hull Area. As we explain in Section 9, we consider that these markets are no longer susceptible to *ex ante* regulation, and propose to remove all remedies in these markets.

## Requirement to provide network access on reasonable request

### Current regulation

16.8 KCOM is currently required to provide network access on reasonable request and to provide such access as soon as it is reasonably practicable. KCOM must provide this network access on fair and reasonable terms, conditions and charges, or on such other terms, conditions and charges that we may from time to time direct. KCOM is also required to comply with any directions we may make from time to time under the condition.

### Aim and effect of proposed regulation

16.9 As our market analysis set out in Section 9 shows, we do not consider that telecoms providers other than KCOM have the ability or incentive to duplicate KCOM's network infrastructure in the Hull Area. The costs of developing such an extensive network infrastructure would be very significant, and with KCOM already having developed its extensive infrastructure and largely sunk the costs of doing so, it is unlikely that other telecoms providers would be able to recover their investment costs. This is a significant barrier to entry.

16.10 In our view, an obligation requiring KCOM to make access to its network available to other telecoms providers on reasonable request is fundamental to promoting competition in downstream markets. We consider that, in the absence of such a requirement, KCOM would have both the incentive and ability to refuse access at the wholesale level, thereby favouring its own retail operations. This would hinder sustainable competition in the corresponding downstream markets, ultimately against end-users' interests.

### Our proposals

16.11 We propose to reimpose on KCOM an SMP condition requiring it to provide network access on fair and reasonable terms and conditions where a third party reasonably requests it. We consider that the general network access obligation should be supported by an obligation to provide such network access on fair and reasonable terms and conditions.

16.12 As in the 2016 BCMR, we consider that this general network access obligation should be supported by an obligation to provide such network access on fair and reasonable charges. We consider that this obligation is needed to address effectively the risk that KCOM may seek to impose a margin squeeze. As in other markets, in assessing this obligation we propose adopting an approach to the evaluation of costs and margins consistent with the margin squeeze test under *ex post* competition law. We also consider that a fair and

reasonable pricing obligation would serve the purpose of providing appropriate protection for other telecoms providers against excessive pricing by KCOM. In assessing this obligation in relation to concerns about excessively high prices, we would consider the alignment of KCOM's charges with Openreach's, taking into account legitimate cost differences arising from KCOM's more limited scale. Our proposed fair and reasonable charging obligation would be supported by the PTR and cost accounting conditions that enable us to see what KCOM were actually charging and how that relates to their costs.

- 16.13 We propose that it is appropriate for this SMP condition to include the power for us to make directions in order that we can secure the supply of services and, where appropriate, fairness and reasonableness in the terms, conditions and charges for providing third parties with network access. The proposed condition includes a requirement for KCOM to comply with any such direction(s), so any contravention of a direction would constitute a contravention of the condition itself and would therefore be subject to enforcement action under Sections 94 to 104 of the Act.
- 16.14 Interconnection and accommodation services fall within the scope of the network access obligations that we propose to impose on KCOM.<sup>434</sup> KCOM would therefore be required to meet reasonable requests for interconnection and accommodation services in relation to services in the wholesale CI Access market.
- 16.15 We do not consider that any requirement for specific forms of network access (i.e. an obligation to provide specific types of wholesale product) is warranted. We consider that opportunities for competition are currently best met by continuing to rely on a general obligation for KCOM to provide network access on reasonable request, which allows telecoms providers to request wholesale products (and associated interconnection and accommodation facilities) as and when required. Our proposed network access obligation would also allow KCOM to recover the efficiently incurred costs associated with any new product requested. We propose not to impose any passive remedy for network access, such as dark fibre, in the Hull Area, as we do not consider that there is sufficient demand for passive remedies or wholesale services more generally in the Hull Area to warrant such an intervention.

## Legal tests

- 16.16 For the reasons set out below, we are satisfied that that the proposed condition meets the relevant tests set out in the Act.
- 16.17 Section 87(3) of the Act authorises us to set SMP services conditions requiring the dominant provider to provide network access as we may from time to time direct. These conditions may, pursuant to section 87(5), include provision for securing fairness and reasonableness in the way in which requests for network access are made and responded

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<sup>434</sup> Network access is defined in section 151(3) and (4) of the Act and includes interconnection services or facilities that would enable other telecoms providers to provide electronic communications services or electronic communications networks. We consider that a requirement to provide network access would, therefore, include any ancillary services as may be reasonably necessary for a third party to use the services.

to, and for securing that the obligations in the conditions are complied with within periods and at times required by or under the conditions. Section 87(9) of the Act also authorises SMP services conditions imposing on the dominant provider price controls in relation to matters connected with the provision of network access, subject to the conditions of Section 88 being satisfied.

- 16.18 In proposing these conditions, we have taken into account the factors set out in Section 87(4) of the Act, which are:
- the technical and economic viability (including the viability of other network access products, whether provided by KCOM or another person), having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;
  - the feasibility of the provision of the proposed network access;
  - the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made);
  - the need to secure effective competition (including, where it appears to us to be appropriate, economically efficient infrastructure-based competition) in the long term;
  - any rights to intellectual property that are relevant to the proposal; and
  - the desirability of securing that electronic communications services are provided that are available throughout the Member States.
- 16.19 In proposing that KCOM should be subject to a requirement to provide network access on reasonable request, we have taken all these six factors into account. In particular, having considered the economic viability of building access networks to achieve ubiquitous coverage that would make the provision of network access unnecessary, we consider that the SMP condition is required to secure effective competition, including economically efficient infrastructure-based competition, in the long term in the wholesale CI Access market. The requirement for KCOM to meet only reasonable network access requests also ensures that due account is taken of the feasibility of providing the network access, and of the investment made by KCOM initially in providing the network.
- 16.20 We are also required to ensure that the condition satisfies the tests set out in Section 88 of the Act as the requirement places controls on network access pricing, insofar as charges are required to be fair and reasonable. Section 88(1) of the Act requires that we must not impose pricing conditions unless it appears from the market analysis carried out for the purpose of setting that condition that there is a relevant risk of adverse effects arising from price distortion. We consider that, in the absence of such a requirement, KCOM may charge excessively or set excessively high charges.
- 16.21 Section 88(1)(b) of the Act requires that the pricing condition should be appropriate for the purposes of promoting efficiency, promoting sustainable competition and conferring the greatest possible benefits on the end-users of public electronic communications services.
- 16.22 We consider that a fair and reasonable charges obligation will prevent KCOM from charging excessively high charges. In this way, this condition supports the aim of improved efficiency. We also consider that the provision of network access on fair and reasonable

terms will promote sustainable competition by ensuring that other telecoms providers can effectively compete at the retail level.

- 16.23 We consider that this proposal meets our duties under Section 3 and all the Community requirements in Section 4 of the Act. In particular, in the wholesale CI Access market the condition is aimed at promoting competition and securing efficiency and sustainable competition for the maximum benefit of customers by facilitating the development of competition in downstream markets.
- 16.24 Section 47(2) of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:
- objectively justifiable, in that it facilitates and encourages access to KCOM's network and therefore promotes competition to the benefit of customers;
  - not unduly discriminatory, as it is proposed only for KCOM and no other telecoms provider has been found to hold a position of SMP in this market;
  - proportionate, since it is targeted at addressing the market power that we propose KCOM holds in this market and does not require it to provide access if it is not technically feasible or reasonable; and
  - transparent, in that it is clear in its intention to ensure that KCOM provides access to its network to facilitate effective competition.
- 16.25 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### **The BEREC Common Position**

- 16.26 We have also taken utmost account of the BEREC Common Position, including BP5 and BP36 which appear to us to be particularly relevant in this case. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## **No undue discrimination**

### **Current regulation**

- 16.27 KCOM is currently prohibited from discriminating unduly in relation to the provision of network access.

### **Aim and effect of proposed regulation**

- 16.28 A non-discrimination obligation is intended as a complementary remedy to the network access obligation, principally to prevent the dominant provider from discriminating in favour of its own downstream divisions and to ensure that competing telecoms providers are placed in an equivalent position. Without such an obligation, the dominant provider is incentivised to provide the requested wholesale network access service on terms and conditions that discriminate in favour of its own downstream divisions. For example, KCOM may decide to charge its competing providers more than the amount charged to its own

- downstream units or it might strategically provide the same services but within different delivery timescales. Both these behaviours could have an adverse effect on competition.
- 16.29 Non-discrimination can have different forms of implementation. A strict form of non-discrimination – i.e. a complete prohibition of discrimination – would result in the SMP operator providing exactly the same products and services to all telecoms providers (including its own downstream divisions) on the same timescales, terms and conditions (including price and service levels), by means of the same systems and processes and by providing the same information. Essentially, the inputs available to all telecoms providers (including the SMP providers' own downstream divisions) would be provided on a truly equivalent basis, an arrangement which has become known as 'Equivalence of Inputs,' or EOI. An EOI obligation removes any degree of discretion accorded to the nature of the conduct.
- 16.30 A less strict implementation of non-discrimination – a no undue discrimination obligation – may allow for flexibility and result in a more practical and cost-effective implementation of wholesale inputs, in cases where it is economically justified. As part of this review, we have considered what form of non-discrimination obligation would be appropriate in the wholesale CI Access market in the Hull Area, and our consultation proposal is set out below.

## Our proposals

- 16.31 As in the 2016 BCMR, we consider that imposing an EOI obligation on KCOM would be disproportionate and unjustified in respect of the scale and competitive conditions in the wholesale CI Access market in the Hull Area. In particular, we note that there has been substantial entry by other telecoms providers and that KCOM's market share has fallen since the 2016 BCMR. We are therefore proposing to re-impose an SMP condition prohibiting undue discrimination for the next BCMR period. This will ensure that there is appropriate non-discrimination protection to remedy the incentive and ability for KCOM to engage in discriminatory pricing and/or non-pricing practices.

## Legal tests

- 16.32 For the reasons below, we are satisfied that the proposed condition meets the relevant tests set out in the Act.
- 16.33 Section 87(6)(a) of the Act authorises the setting of an SMP services condition requiring the dominant provider not to discriminate unduly against particular persons, or against a particular description of persons, in relation to matters connected with the provision of network access.
- 16.34 Section 87(6) implements into UK law Article 10 of the Access Directive. Article 10(1) provides that a national regulatory authority may: "impose obligations of non-discrimination, in relation to interconnection and/or access."
- 16.35 Article 10(2) further provides:

“[o]bligations of non-discrimination shall ensure, in particular, that the operator applies equivalent conditions in equivalent circumstances to other undertakings providing equivalent services, and provides services and information to others under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners.”

- 16.36 We have considered our duties under Section 3, and all the Community requirements set out in Section 4, of the Act. In particular, the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit for customers by preventing KCOM from leveraging its SMP through discriminatory behaviour into downstream markets.
- 16.37 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed SMP condition is:
- objectively justifiable, in that it provides a safeguard to ensure that competitors, and hence customers, are not disadvantaged by KCOM discriminating unduly in favour of its own downstream activities or between different competing providers;
  - not unduly discriminatory, in that it is proposed only for KCOM and no other operator has been found to hold a position of SMP in this market;
  - proportionate, in that it only seeks to prevent undue discrimination; and
  - transparent, in that the condition is clear in what it is intended to achieve.
- 16.38 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### The BEREC Common Position

- 16.39 We have taken utmost account of the BEREC Common Position in formulating our proposals, including BP8, BP10 and BP10a which appear to us to be particularly relevant in this context. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## Transparency

- 16.40 KCOM is currently subject to a set of obligations designed to promote transparency, reduce the risk of undue discrimination and ensure that telecoms providers are able to make effective use of its network access. These obligations which are discussed in more detail below are:
- a requirement to publish an RO;
  - a requirement to notify of changes to charges, terms and conditions in advance; and
  - a requirement to notify of changes to technical information in advance.

## Publication of a Reference Offer

### Current regulation

- 16.41 KCOM is currently required to publish an RO for wholesale network access products.<sup>435</sup>
- 16.42 The RO must set out a number of matters at a minimum, including the terms and conditions for provisioning, technical information, service level agreements and service level guarantees, and availability of co-location.

### Aim and effect of proposed regulation

- 16.43 In KCOM's case, a requirement to publish an RO has three main purposes:
- to assist transparency for the monitoring of potential anti-competitive behaviour;
  - to give visibility to the terms and conditions on which other telecoms providers purchase wholesale services; and
  - to enable the monitoring of wholesale charges, which forms part of our proposed approach to price controls in this market.
- 16.44 The publication of an RO helps to ensure stability in markets as, without it, incentives to invest might be undermined and market entry less likely.
- 16.45 The publication of an RO would allow for potentially quicker negotiations, avoid possible disputes and give confidence to those purchasing wholesale services that they are being provided on non-discriminatory terms. Without this, market entry might be deterred to the detriment of the long-term development of competition and hence customers. Moreover, in conjunction with the non-discrimination obligation, the effect of this obligation is to prevent KCOM from:
- bundling leased lines together with other non-SMP products or services i.e. making the sale of a retail leased lines conditional on the sale of another product or service, including as part of a package incorporating another product or service; and
  - offering bespoke charges to secure business contracts against competition from other telecoms providers. KCOM is still permitted to offer discounts, but the terms of any such discounts have to be published in the RO and available to all customers.

### Our proposals

- 16.46 We consider that the requirement to publish ROs imposed on KCOM in previous market reviews has been largely effective in meeting the aims of regulation detailed above. Therefore, we propose that KCOM should continue to be required to publish an RO for network access products in the wholesale CI Access market in the Hull Area.
- 16.47 The proposed condition requires the publication of an RO and specifies the information to be included in that RO (set out below) and how the RO should be published. It prohibits

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<sup>435</sup> In the 2016 BCMR we introduced a requirement that KCOM must publish its ROs on publicly available websites, i.e. those that do not require password access, to ensure full transparency for us and other telecoms providers.

KCOM from departing from the charges, terms and conditions in the RO and requires it to comply with any directions we may make from time to time under the condition. The published RO must set out a number of matters at a minimum, including:

- a description of the services on offer, including technical characteristics and operational processes for service establishment, ordering and repair;
- the locations of points of network access and the technical standards for network access;
- conditions for access to ancillary and supplementary services associated with the network access, including operational support systems and databases, etc.;
- contractual terms and conditions, including dispute resolution and contract negotiation/renegotiation arrangements;
- charges, terms and payment procedures;
- service level agreements and service level guarantees; and
- to the extent that KCOM uses the service in a different manner to telecoms providers or uses similar services, KCOM is required to publish an RO in relation to those services.

16.48 We consider that imposing a requirement on KCOM to publish an RO is necessary to achieve these aims and effects in the wholesale CI Access market where we provisionally find KCOM to hold SMP. This remedy complements our proposals to impose network access and non-discrimination requirements on KCOM to address the competition concerns arising from its SMP in this market.

16.49 Furthermore, we consider that there is a risk that KCOM may set excessive prices for wholesale CI Access leased lines in the Hull Area. To mitigate this risk, we continue to consider that KCOM should be prohibited from departing from the charges, terms and conditions set out in its RO. This will better enable us to monitor KCOM's charges more effectively and benchmark them against Openreach's, as discussed elsewhere in this section.

## Legal tests

16.50 For the reasons set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.

16.51 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 we 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 RO. Finally, Section 87(6)(e) permits the setting of SMP services conditions requiring the dominant provider to make such modifications to the RO as may be directed from time to time.

16.52 We consider that the proposed condition satisfies our duties under Section 3, and all the Community requirements set out in Section 4, of the Act.

16.53 The requirement to publish an RO will, in combination with a requirement not to discriminate unduly, facilitate service interoperability and allow telecoms providers to

make informed decisions about future entry into the relevant market. Further, the obligation will enable buyers to adjust their downstream offerings in competition with KCOM in response to changes in KCOM's terms and conditions. Finally, the obligation will make it easier for us and other telecoms providers in the relevant market to monitor any instances of discrimination. Therefore, we consider that the condition, in particular, furthers the interests of customers in the relevant market by promoting competition in accordance with Section 3 of the Act.

16.54 We also consider that the condition meets the Community requirements set out in Section 4 of the Act. In particular, the condition promotes competition, and encourages the provision of network access and service interoperability for the purpose of securing efficiency and sustainable competition for the maximum benefit for customers. The publication of an RO will mean that other telecoms providers will have the necessary information readily available.

16.55 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:

- objectively justifiable, in that it requires that terms and conditions are published to encourage competition, provide stability in markets and allow monitoring of anti-competitive behaviour;
- not unduly discriminatory, in that it is proposed only for KCOM and no other operator has been found to hold a position of SMP in this market;
- proportionate, in that only information that is considered necessary to allow telecoms providers to make informed decisions about competing in downstream markets is required to be provided; and
- transparent, in that it is clear in its intention to ensure that KCOM publishes details of its service offerings.

16.56 Article 9(4) of the Access Directive requires that where network access obligations are imposed, national regulatory authorities shall ensure the publication of an RO containing at least the elements set out in Annex II to that Directive. We are satisfied that this requirement is met.

16.57 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### **The BEREC Common Position**

16.58 In formulating these proposals, we have also taken utmost account of the BEREC Common Position, including BP16, BP22 and BP23 which appear to us to be particularly relevant in this context. We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

## Notification of changes to charges, terms and conditions

### Current regulation

16.59 KCOM is currently required to give advance notice before making changes to its charges or terms and conditions for the provision of existing or new network access.

### Aim and effect of proposed regulation

- 16.60 Notification of changes to charges at the wholesale level has the joint purpose of assisting transparency for the monitoring of potential anti-competitive behaviour and giving advance warning of charge changes to competing telecoms providers who buy wholesale access services. The latter purpose ensures that competing telecoms providers have sufficient time to plan for such changes, as they may want to restructure the charges of their downstream offerings in response to charge changes at the wholesale level. Notification of changes therefore helps to ensure stability in markets, without which incentives to invest might be undermined and market entry made more difficult.
- 16.61 There may be some disadvantages to advance notification, particularly in markets where there is some competition. It can lead to a chilling effect where other telecoms providers follow KCOM's charges rather than act dynamically to set competitive charges. We do not consider, on balance, that this consideration undermines the rationale for imposing a notification of charges condition.
- 16.62 In wholesale leased lines markets where competitors rely on the provision of wholesale access products and services to enable them to compete in downstream markets, we consider that the advantages of notifying charges are likely to outweigh any potential disadvantages.
- 16.63 It may also be appropriate to require the notification of changes to terms and conditions to allow competing telecoms providers sufficient time to plan for them. Again, this assists in providing stability in markets, without which incentives to invest might be undermined and market entry made more difficult.
- 16.64 This remedy complements the network access and non-discrimination requirements on dominant providers to address the competition concerns arising from a position of SMP in wholesale leased lines markets.

### Our proposals

- 16.65 We propose to slightly amend KCOM's obligations to notify changes to its charges, terms and conditions. We propose to maintain the following notification periods:
- 28 days' notice for charges, terms and conditions relating to new service introductions; and
  - 28 days' notice for price reductions relating to existing network access.

- 16.66 However, we propose two amendments to align with the requirements in the 2018 WLA and WBA market reviews with respect to the Hull Area<sup>436</sup>:
- we propose to reduce the notice period applicable to other changes to prices, terms and conditions for existing network access from 90 days to 56 days. In the 2018 WLA Market Review we decided to decrease the notice period in the WLA market from 90 days to 56 days.<sup>437</sup> We noted that the market in the Hull Area is much smaller than that in the rest of the UK, and the size and complexity of BT's and its competitors' networks are greater than KCOM's. In light of these factors we considered that 56 days was an appropriate notice period. We believe the same considerations apply here, and propose to reduce the notice period accordingly.
  - we propose to require KCOM to give 28 days' notice in relation to price changes relating to the end of a temporary price reduction.<sup>438</sup>
- 16.67 In proposing to retain these notification periods, we have considered the following relevant factors:
- wholesale leased line services support multiple downstream services. This means that telecoms providers will need to assess the impact of any changes downstream. Typically, this might involve modelling the impact of the new charges on the cost of providing downstream services, securing internal approval for a pricing revision and notifying customers (which may be subject to a minimum notice period);
  - too short a notification period would risk that telecoms providers would have insufficient time to react to changes to wholesale terms and could, for instance, be left financially exposed by changes to wholesale charges. However, as mentioned above, we consider that 56 days provides sufficient notice in the context of the market in the Hull Area; and
  - there should be no risk of financial exposure for telecoms providers when charges are reduced, so a 28-day notification period is appropriate.

## Legal tests

- 16.68 For the reasons set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 16.69 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, in such manner as we may direct, all such information for the purpose of securing transparency. Section 87(6)(c) also permits the setting of SMP

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<sup>436</sup> Ofcom, 2018. *Wholesale Local Access and Wholesale Broadband Access Market Reviews: Review of competition in the Hull Area*, paragraphs 4.172-4.182. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0027/116991/statement-wba-competition-hull.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0027/116991/statement-wba-competition-hull.pdf).

<sup>437</sup> In WBA we increased the period from 28 days to 56 days.

<sup>438</sup> A temporary price means a price reduction for a particular product or service, applicable to all customers on a non-discriminatory basis, which is stated to apply for a limited and predefined period and where the price immediately on expiry of that period is no higher than the price immediately before the start of that period, i.e. a special offer. A 28-day notice period also applies to any increase in prices that may occur at the end of a special offer (where the price immediately following the end of the special offer is no higher than the price immediately before the start of the special offer).

services conditions requiring the dominant provider to publish the terms and conditions on which he is willing to enter into an access contract.

- 16.70 We consider that the proposed condition satisfies our duties under Section 3, and all the Community requirements set out in Section 4, of the Act. In particular, the condition is aimed at promoting competition, and securing efficient and sustainable competition for the maximum benefit of customers. This is achieved by ensuring that telecoms providers have the necessary information about changes to terms, conditions and charges sufficiently in advance to allow them to make informed decisions about competing in downstream markets.
- 16.71 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:
- objectively justifiable: in that there are clear benefits from the notification of changes in terms of ensuring that telecoms providers are able to make informed decisions within an appropriate time frame about competing in downstream markets;
  - not unduly discriminatory: as it is proposed only for KCOM and no other operator has been found to hold a position of SMP in this market;
  - proportionate: as the notice periods we propose to specify are sufficient for the types of change to which they relate; and
  - transparent: in that it is clear in its intention to ensure that KCOM provides notification of changes to its charges, terms and conditions.
- 16.72 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### **The BEREC Common Position**

- 16.73 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP16 and BP17 (“Transparency”).

## **Notification of changes to technical information**

### **Current regulation**

- 16.74 KCOM is currently required to publish, in advance, changes to technical information.<sup>439</sup> This requires the notification of new technical information within a reasonable time period, but not less than 90 days in advance of providing new wholesale services or amending existing technical terms and conditions.

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<sup>439</sup> In the 2016 BCMR we introduced a requirement that KCOM must publish any technical change notice on publicly available websites, i.e. those that do not require password access, to ensure full transparency for us and other telecoms providers.

## Aim and effect of proposed regulation

- 16.75 The aim of this regulation is to ensure that telecoms providers have sufficient time to respond to technical changes that may affect them. For example, a telecoms provider may need to introduce new equipment, or modify existing equipment or systems, to support a new or changed technical interface. Similarly, a telecoms provider may need to make changes to its network to support changes in the points of network access or configuration.
- 16.76 We consider this remedy is important in the wholesale CI Access market to ensure that telecoms providers who compete in downstream markets are able to make effective use of existing or, where applicable, new wholesale services provided by KCOM. Technical information therefore includes new or amended technical characteristics, including information on network configuration, locations of the points of network access and technical standards (including any usage restrictions and other security issues).

## Our proposals

- 16.77 We take the view that these requirements continue to be necessary to give telecoms providers sufficient time to prepare for such changes. We therefore propose to continue to require KCOM to notify new technical information within a reasonable time period, but not less than 90 days in advance of providing new wholesale services or amending existing technical terms and conditions.
- 16.78 We consider that 90 days is the minimum time that competing telecoms providers need to modify their network to support a new or changed technical interface, or support a new point of access or network configuration.
- 16.79 The requirement to give notification within a reasonable time period may mean that a period of notification in excess of 90 days may be appropriate in certain circumstances. For example, if KCOM was to make a major change to its technical terms and conditions, a period of more than the 90-day minimum notification period may be necessary to enable competing telecoms providers, who purchase affected wholesale services, sufficient time to prepare and support such changes without disruption and detriment to their businesses and customers.

## Legal tests

- 16.80 For the reasons set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 16.81 Section 87(6)(b) of the Act authorises the setting of SMP services conditions which require a dominant provider to publish, in such manner as we may direct, all such information, for the purpose of securing transparency. Section 87(6)(c) also permits the setting of SMP services conditions requiring the dominant provider to publish the terms and conditions on which he is willing to enter into an access contract.
- 16.82 We consider that the proposed condition satisfies our duties under Section 3, and all the Community requirements set out in Section 4, of the Act. In particular, the condition is

aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of customers by ensuring that telecoms providers have sufficient notification of technical changes to CI services to enable them to compete in downstream markets.

16.83 Section 47 of the Act requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:

- objectively justifiable: in that it enables telecoms providers to make full and effective use of network access to be able to compete in downstream markets;
- not unduly discriminatory: as it is proposed only for KCOM and no other operator has been found to hold a position of SMP in this market;
- proportionate: in that 90 days is the minimum period that we consider is necessary to allow competing telecoms providers to modify their networks; and
- transparent: in that it is clear in its intention that KCOM notify changes to technical information in advance.

16.84 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### The BEREC Common Position

16.85 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP16 and BP17.

## Approach to price controls in the Hull Area

16.86 We are concerned that, in the absence of appropriate *ex ante* regulation, KCOM would have the incentive and ability to fix and maintain some or all of its CI Access prices at an excessively high level or engage in a margin squeeze.

16.87 Our proposed approach to price controls is designed to address these concerns.

### Current price controls

16.88 In the 2016 BCMR, rather than imposing a charge control or a cost orientation obligation to address the risk of excessive pricing by KCOM, we decided that a more proportionate approach would be to impose an obligation for KCOM to ensure that its charges are fair and reasonable and to monitor KCOM's wholesale charges against suitable benchmarks.

16.89 For the wholesale leased lines markets, we adopted an approach to monitor KCOM's wholesale charges against a benchmark of Openreach's wholesale charges.<sup>440</sup> We said that this would enable us to undertake more detailed analysis to determine what measures might be appropriate to deal with any concerns.

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<sup>440</sup> The current requirement also applies to KCOM's retail prices. As discussed in Section 9 we propose that KCOM no longer has SMP at the retail level.

- 16.90 We considered that for this approach to be fully effective it was important that there was transparency about KCOM’s wholesale charges. We therefore:
- removed KCOM’s flexibility to offer unpublished bespoke discounts by requiring it to publish its wholesale charges in its Reference Offer (RO) and not to depart from them<sup>441</sup>; and
  - introduced a requirement that KCOM provide us with an annual Pricing Transparency Report (PTR) that details the charges it makes to its customers for the connection and annual rental of the leased line services supplied during the previous twelve months.<sup>442</sup>
- 16.91 On the basis of the 2018 PTR, we have been unable to undertake a full analysis of KCOM’s recent pricing. We have asked KCOM for clarification of some of the data in the 2018 PTR, and will continue to discuss with KCOM following publication of this consultation.
- 16.92 These issues notwithstanding, our analysis of the wholesale charges for CI services contained within the 2018 PTR indicates that for those services where a comparison was possible, the majority of the services were consistent with KCOM’s RO.<sup>443</sup>
- 16.93 We also considered how KCOM’s RO prices compared against the RO price for the nearest Openreach equivalent services. In the 2016 BCMR, we found that KCOM’s published wholesale charges were broadly in line with Openreach’s in April 2016, once differences in circuit configuration were taken into account (and noting that there may be reasons for KCOM’s charges to differ from Openreach’s, for example if its costs are higher as it benefits to a lesser extent from economies of scale). As noted above, we have asked KCOM for clarification of some of the data in the 2018 PTR so that we can assess whether KCOM’s 2017 charges are broadly in line with Openreach charges. KCOM has told us that its charges are on a glidepath towards Openreach’s equivalent charges.<sup>444</sup>
- 16.94 We will continue to discuss these issues with KCOM.

## Proposed approach

- 16.95 We propose to maintain our existing approach to price controls in the Hull Area, requiring KCOM to:
- provide network access on reasonable request and on fair and reasonable charges, terms and conditions;
  - publish its wholesale charges in its RO and not to depart from them; and
  - produce a PTR.
- 16.96 We consider that the proposed fair and reasonable charging obligation, in conjunction with transparency obligations that will enable us to monitor KCOM’s wholesale charges against

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<sup>441</sup> Discussed further above.

<sup>442</sup> Discussed further below.

<sup>443</sup> 95% of the connection charges and 85% of the annual rental were within the range of KCOM RO prices, although we note that some of the connection charges and associated rentals used to derive these percentages were set before KCOM was subject to an obligation not to depart from RO charges.

<sup>444</sup> Meeting between Ofcom and KCOM, 13 June 2018.

- suitable benchmarks, is the most appropriate approach to address the risk of excessive pricing in the context of the Hull Area.
- 16.97 While in principle a more fully specified charge control may be effective in controlling KCOM's charges, we always seek to impose the minimum necessary remedy to achieve the aim pursued, in light of available evidence. We consider that a more fully specified charge control would be disproportionate to the aim of preventing excessive charges, particularly given the relatively small size of the Hull Area and the significant costs to us and KCOM that would arise in formulating a charge control. We also note that KCOM has not previously been subject to a charge control in the wholesale CI Access market.
- 16.98 We have considered the alternative of imposing a cost orientation obligation to address the risk of excessive pricing. However, we remain of the view that a cost orientation obligation in the present circumstances would be disproportionate for similar reasons discussed above in relation to a charge control. In addition, we consider that such an obligation, if used as the primary control on KCOM's charges, would not provide the necessary incentive for KCOM to incur its costs efficiently that we think would be required for this remedy to be effective.
- 16.99 As in previous reviews, we consider that Openreach's wholesale charges are a relevant benchmark for assessing KCOM's wholesale charges. This is because the services provided by KCOM have the same technical characteristics as those provided by Openreach. After taking into account differences in costs (which is made easier by the introduction of a cost accounting obligation as set out below), we consider that KCOM's wholesale charges should be fairly closely aligned to Openreach's charges for broadly comparable charge-controlled products. To aid our monitoring of KCOM's wholesale charges, we propose a cost accounting obligation. This remedy additionally supports KCOM's regulatory financial reporting as it allows us to better account for differences in cost between KCOM and Openreach. It should therefore improve our ability to benchmark KCOM wholesale prices against Openreach wholesale prices.
- 16.100 We acknowledge that KCOM and Openreach have adopted differing price structures for their wholesale leased lines services, reflecting differing approaches to recovering their costs (for example, the balance between connection and rental charges). However, we consider that, notwithstanding these differences, a meaningful price comparison can be produced.
- 16.101 In addition to a fair and reasonable charging requirement, we propose to retain the requirement on KCOM to publish its wholesale charges in its RO and not to depart from them, and to produce a PTR. We consider that it is important that there is transparency about KCOM's wholesale charges to enable us to monitor them effectively and to assess whether the fair and reasonable charging obligation is being complied with. We may consider enforcement action if our monitoring activities reveal any material departure from KCOM's RO charges, or if the PTR is late, incomplete or inaccurate.

## Requirement to produce a Pricing Transparency Report

### Current regulation

16.102 KCOM is currently required to provide a PTR to us on an annual basis. The report lists all the wholesale leased lines that are provided by KCOM (both internal and external sales) that fall within any of the regulated wholesale leased lines markets in the Hull Area, accompanied with information about each leased line.

### Aim and effect of proposed regulation

16.103 As set out above, a requirement to produce a PTR and submit it to us will provide us with information about the actual charges that are being paid by customers for wholesale leased lines. This information will enable us to monitor charges against a suitable benchmark and determine whether KCOM is complying with the obligation to charge fair and reasonable charges.

16.104 Moreover, a PTR enables the monitoring of KCOM's compliance with its other SMP conditions, such as the obligation to publish an RO and not depart from the charges, terms and conditions set out within it, and the obligation not to discriminate unduly.

### Our proposals

16.105 We consider that imposing this requirement on KCOM is necessary to achieve the aim and effect of the regulation in the wholesale CI Access market where we provisionally find KCOM to hold SMP. We therefore propose to reimpose the condition on KCOM to produce a PTR to be sent to us on an annual basis.

16.106 However, during our assessment of the 2018 PTR received from KCOM we found it difficult to determine which RO price should apply to some of the connections, as some of KCOM's charges appear to depend on information which is not reported within the PTR. While we could obtain such information using our statutory information gathering powers, we believe it will be more efficient and appropriate in the future if such information is provided as part of the PTR.

16.107 The current condition requires KCOM to include in the PTR the following information separately for each wholesale connection:

- a specification of each of the service type, interface, bandwidth and circuit orientation;
- the amount of the connection charge;
- the date on which the rental charge was agreed;
- any fixed or minimum term agreed by the dominant provider and a third party in respect of the rental charge; and
- the amount and the frequency of the rental charge.

16.108 Our analysis of KCOM's 2017 and 2018 PTRs suggests that there are a number of other factors that may be relevant for assessing KCOM's charges, as follows:

- whether a circuit connects two customer sites or connects one customer site to a provider point of presence (POP) in the local exchange only;
- whether there is “No existing network connectivity” or “Existing Network Connectivity;”<sup>445</sup>
- whether connections are subject to excess construction charges; and
- where a connection spans two different exchanges, which pair of exchanges are included in the connection.

16.109 We therefore propose to add to the current condition an additional clause that requires KCOM to set out “such characteristics of each connection as required to fully determine the connection charge and annual rental charge from the KCOM price list.”

## Legal tests

- 16.110 For the reasons set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.
- 16.111 Section 87(6)(b) of the Act authorises the setting of SMP services conditions requiring the dominant provider to publish information for the purpose of securing transparency in relation to matters connected with network access to the relevant network.
- 16.112 We have had regard to our duties under section 3, and all the Community requirements set out in section 4, of the Act. We note that the SMP condition is aimed at providing transparency about the prices that KCOM charges to enable us to monitor wholesale charges.
- 16.113 Section 47 of the Act requires conditions to be objectively justifiable, not unduly discriminatory, proportionate and transparent. The proposed SMP condition is:
- objectively justifiable: in that it enables the monitoring of KCOM’s wholesale charges, as well as monitoring KCOM’s compliance with the other obligations, specifically the obligation to publish an RO and not to depart from the charges, terms and conditions set out within it, and the obligation not to unduly discriminate;
  - not unduly discriminatory: as only KCOM, and no other operator, has been found to hold a position of SMP in this market and would therefore have the ability and incentive to exploit customers by withholding or misusing information;
  - proportionate: since it is targeted at addressing the SMP that we have found KCOM holds in this market. This obligation supports the other SMP conditions imposed to address KCOM’s SMP in this market by providing pricing transparency as a safeguard against excessive pricing, and ensure KCOM’s compliance with its other SMP conditions; and
  - transparent: in that the SMP condition is clear in its intention and because the purpose and meaning of the obligation and the reasons for imposing it are clearly explained in this document.

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<sup>445</sup> These are terms used in KCOM’s 2018 PTR which we intend to clarify with KCOM.

16.114 For the reasons set out above, we consider that the proposed conditions is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### The BEREC Common Position

16.115 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP16 and BP17.

## Regulatory financial reporting

16.116 As explained in the following Sections, we propose to impose cost accounting and accounting separation obligations on KCOM in the wholesale CI Access market. We propose to implement these obligations by way of a single SMP condition, which would replace the current Regulatory Financial Reporting SMP condition.<sup>446</sup> This proposed approach differs from the approach taken in the 2016 BCMR, in which we only imposed an accounting separation remedy. Our rationale for applying each of these remedies is set out below, but broadly it is that we consider that there is a need for detailed financial information on this market to monitor the effectiveness of our proposed regulatory decisions.

16.117 These obligations are underpinned by regulatory financial reporting directions which specify in detail the information KCOM is required to provide. We recently consulted on these directions, which apply across wholesale markets.<sup>447</sup> These proposed directions may change as a result of this consultation. However, under our proposals they will be in place by the time the 2019 BCMR is published. Therefore, when the 2019 BCMR is published, we propose to roll over these directions in the form that they are adopted (insofar as they apply to business connectivity markets). We will set out detailed reporting requirements for KCOM in our forthcoming statement on KCOM's regulatory financial reporting.

## Accounting separation

### Current regulation

16.118 KCOM is currently subject to accounting separation obligations.<sup>448</sup>

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<sup>446</sup> In previous reviews, we have imposed this condition by amending the notification annexed to the 2004 Regulatory Reporting Statement. We are proposing to revoke that notification (insofar as it applies in relation to the relevant markets) and imposing the regulatory financial reporting obligations through SMP condition 7. This accords with the approach taken in the 2018 *Wholesale Local Access and Wholesale Broadband Access Market Reviews: Review of Competition in the Hull Area*. For the avoidance of doubt, this does not represent a change to the substance of the relevant SMP condition; it is a structural change to the way in which the regulatory financial reporting obligations are imposed and is aimed at clarifying KCOM's obligations.

<sup>447</sup> Ofcom, 2018. *KCOM Regulatory Financial Reporting: Consultation on proposed regulatory financial reporting directions for KCOM*. [https://www.ofcom.org.uk/data/assets/pdf\\_file/0017/117413/consultation-kcom-regulatory-financial-reporting.pdf](https://www.ofcom.org.uk/data/assets/pdf_file/0017/117413/consultation-kcom-regulatory-financial-reporting.pdf).

<sup>448</sup> These obligations are SMP conditions OB1 to OB27 and OB31 to OB33, but excluding subparagraphs (a) to (c) and (f) of SMP condition OB23, set out in the July 2004 (KCOM) Notification, but as read considering the modifications to that Notification set out in paragraph 26 of the 2016 Notification (as set out at Annex 35 Section 1 of the 2016 BCMR).

## Aim and effect of proposed regulation

16.119 Paragraph 3 of Point 1 of the 2005 Recommendation states that:

- “the purpose of imposing an obligation regarding accounting separation is to provide a higher level of detail of information than that derived from the statutory financial statements of the notified operator, to reflect as closely as possible the performance of parts of the notified operator’s business as if they had operated as separate businesses, and in the case of vertically integrated undertakings, to prevent discrimination in favour of their own activities and to prevent unfair cross-subsidy.”

16.120 We consider that our proposal to impose an accounting separation obligation, together with a cost accounting obligation (see below), will help to ensure this objective is met.

16.121 The proposed obligation requires KCOM to report separately for services across the relevant market, and account separately for internal and external sales. This allows us and other telecoms providers to monitor the activities of KCOM to ensure that it does not discriminate unduly in favour of its own downstream businesses. In practice, this obligation requires KCOM to produce financial statements that reflect the performance of the regulated wholesale market as though it were a separate business.

## Our proposals

16.122 We consider that these obligations are necessary to monitor KCOM’s activities regarding its non-discrimination obligations. For the next BCMR period, we therefore propose to reimpose the same accounting separation obligations that are currently imposed on KCOM in the wholesale CI Access market in which we propose it has SMP.

## Legal tests for adoption of the regulation

16.123 For the reasons set out below, we are satisfied that the proposed condition meets the various tests set out in the Act.

16.124 Sections 87(7) and 87(8) of the Act authorise us to impose appropriate accounting separation obligations on the dominant provider in respect of the provision of network access, the use of the relevant network and the availability of relevant facilities. That is to say, the dominant provider may be required to maintain a separation for accounting purposes between such different matters relating to network access or the availability of relevant facilities.

16.125 We consider that this proposal meets our duties under Sections 3 and 4 of the Act. We consider that the imposition of accounting separation obligations promotes competition in relation to the provision of electronic communications networks and services, ensuring the provision of network access and service interoperability for the purposes of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of telecoms providers. This is because the imposition of the obligation would ensure that other obligations designed to curb potentially damaging leveraging of market

power, in particular the requirement not to unduly discriminate, can be effectively monitored and enforced.

16.126 With regard to the Community requirements set out in Section 4 of the Act, we believe that the proposed condition meets the requirements. Specifically, we believe section 4(8) is met, where the obligation has the purpose of securing efficient and sustainable competition in the markets for electronic communications networks and services, by helping to ensure that dominant providers comply with other obligations, in particular non-discrimination requirements.

16.127 We also consider that this proposal meets Section 47(2) of the Act which requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. We consider the proposed condition is:

- objectively justifiable: in that it relates to the need to ensure competition develops fairly to the benefit of customers;
- not unduly discriminatory: as it is only imposed on KCOM, which is the only telecoms provider which we propose to find has SMP in the relevant market in the Hull Area;
- proportionate: in that it is the least onerous obligation necessary as a mechanism to allow us and third parties to monitor potentially discriminatory behaviour by KCOM; and
- transparent: in that it is clear that the intention is to monitor compliance with specific remedies and the particular accounting separation requirements of KCOM are clearly documented within the SMP conditions.

16.128 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

### **The BEREC Common Position**

16.129 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP30 to BP37.

## **Cost accounting**

### **Current regulation**

16.130 KCOM is not currently subject to a cost accounting remedy.

### **Aim and effect of proposed regulation**

16.131 Recital 2 of the 2005 Recommendation states that the purpose of imposing the accounting separation and cost accounting obligations is “to make transactions between operators more transparent and/or to determine the actual costs of services provided.” Also, paragraph 2 of Point 1 of the 2005 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.”

16.132 The imposition of a cost accounting obligation ensures that KCOM has in place a system of rules that support the attribution of revenues and costs to services within the relevant market. It therefore supports the proposed accounting separation obligation, which requires KCOM to prepare and report financial information relating to individual services, by ensuring that the rules attributing revenues and costs to services within the relevant market are fair, objective and transparent. The cost accounting obligation is an important means of ensuring that:

- we have the necessary information to support the monitoring of the effectiveness of remedies, in particular to ensure that the pricing remedies we propose address the competition problems identified and to enable our timely intervention should such intervention ultimately be needed;
- revenues and costs are attributed across regulated markets (and the individual services within them) in a consistent manner. This mitigates the risk that costs might be unfairly loaded onto particular products or markets;
- publication (i.e. reporting) of cost accounting information aids transparency, providing reasonable confidence to stakeholders about compliance with SMP obligations, allowing stakeholders to monitor compliance and more generally enabling stakeholders to make better informed contributions to the development of the regulatory framework; and
- KCOM 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 strong possibility that the necessary information would not be available when it is required and in the necessary form and manner.

## Our proposals

16.133 We propose to impose a cost accounting remedy on KCOM in the wholesale CI Access market in the Hull Area. We consider that the proposed obligation is necessary to ensure that the processes and rules used by KCOM to attribute revenues and costs to relevant services are fair, objective and transparent.

## Legal tests

16.134 For the reasons set out below, we are satisfied that the proposed cost accounting requirements for KCOM in respect of the wholesale CI Access market in the Hull Area meet the various tests set out in the Act.

16.135 Section 87(9)(c) authorises conditions imposing such rules as we may make for the purposes of matters connected with the provision of network access to the relevant network, or with the availability of relevant facilities about the use of cost accounting systems. Such conditions include requiring the application of presumptions in the fixing and determination of costs and charges for the purposes of the price controls, rules and obligations imposed by virtue of that sub-section (Section 87(10)). Where such conditions

are imposed, Section 87(11) imposes a duty on us to also set an SMP condition which imposes an obligation:

- to make arrangements for a description to be made available to the public of the cost accounting system used in pursuance of that condition; and
- to include in that description details of (i) the main categories under which costs are brought into account for the purposes of that system and (ii) the rules applied for the purposes of that system with respect to the allocation of costs.

16.136 We consider that the proposed condition fulfils our duty under Section 87(11) in that the cost accounting condition requires the publication of a description of the cost accounting system used and the main categories of cost and the cost allocation rules applied.

16.137 In setting such a condition, we must also ensure that the network access pricing conditions set out in Section 88 are also satisfied.

16.138 We consider that imposing a cost accounting obligation is consistent with Section 88. We also consider that imposing a cost accounting obligation is necessary for our price regulation obligations to be effective.

16.139 We have considered our statutory obligations and the Community requirements set out in Sections 3 and 4 of the Act. In particular, we consider that imposing the proposed cost accounting obligation is justifiable and proportionate to promote competition in relation to the provision of electronic communications networks and services, and to ensure the provision of network access (including supporting ancillary services) and service interoperability for the purpose of securing efficient and sustainable competition and the maximum benefit for the persons who are customers of telecoms providers. This is because imposing the obligation ensures that other obligations designed to curb the potentially damaging leverage of market power – including the setting of prices at excessive levels – can be effectively monitored and enforced.

16.140 We consider that the proposed condition meets the criteria set out in Section 47(2) of the Act because it is:

- objectively justifiable: in that it is necessary to ensure the appropriate maintenance and provision of accounts to monitor KCOM's activities with regard to the pricing remedies we propose. It also relates to the need to ensure competition develops fairly, to the benefit of customers, by providing transparency of KCOM's compliance with rules set to address the risk of exploitative or anti-competitive pricing;
- non-discriminatory: in that KCOM is the only telecoms provider on which we propose to impose pricing remedies, and is the only telecoms provider which we propose to find holds SMP in the wholesale CI Access market in the Hull Area;
- proportionate: in that we propose to require only the minimum information necessary to monitor KCOM's pricing activities; and
- transparent: in that it is clear in its intention to ensure the appropriate maintenance and provision of accounts for the purposes set out above and the particular cost accounting requirements of KCOM are clearly documented.

16.141 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with Section 87(1) of the Act.

#### **The BEREC Common Position**

16.142 We consider that the proposed condition is consistent with the BEREC Common Position, including the remedies falling under objectives BP30 to BP37.

### **Consultation question**

Question 16.1: Do you agree with the remedies in the Hull Area that we propose? Please provide evidence to support your views.