Response to Ofcom's consultations on the Physical Infrastructure and the Business Connectivity Market Reviews

BT Group's Response to the consultations published on 2 November 2018

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About this document

We note that the response date for Ofcom's consultation on the PIMR has been put back to Friday 1 February 2019. Notwithstanding we are submitting this combined response on 18 January 2019 to both the PIMR and BCMR consultations. This combined response reflects the views of BT plc. We note that Openreach, a wholly owned subsidiary of BT, intends to submit its response to the PIMR consultation on 1 February 2018. We reserve the right to amend or supplement this response to reflect any developments in the Openreach response to that consultation.

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Contents

1 Executive summary

1.1 The Physical Infrastructure Market Review 'PIMR' 2018 and Business Connectivity Market Review 'BCMR' 2018 are Ofcom's first market reviews since it spelt out its Strategic Policy Position in July 2018. In many respects, Ofcom's proposals are consistent with its policy objectives which now focus on promoting investment and competition (with timely interventions where there is no commercial case to build networks). Ofcom targets regulation upstream (through the PIMR) and proposes remedies downstream which are intended to incentivise investment (with a view to removing them as competition becomes effective).

1.2 Ofcom's strategic aims would, however, be better delivered through a different approach in several areas. Physical infrastructure access (the new focus of regulation) will materially reduce fibre deployment costs and drive network competition. Markets should be allowed to respond to this game-changing intervention without as much prescriptive regulation downstream of physical infrastructure. This would better support competitive investment and good outcomes for customers.

Achieving better alignment with strategic objectives

1. Ofcom should wait until 2021 before removing duct and pole access usage restrictions. The existing (mixed usage) duct and pole remedy will support Ofcom's investment and competition objectives until 2021. This would allow unrestricted duct and pole access 'UDPA' to be properly assessed, looking across business and residential markets, to ensure it delivers tangible benefits for customers without over-reaching
2. The regime for regulating physical infrastructure should provide long-term stability, predictability and a fair opportunity for Openreach to recover the efficiently incurred costs of providing shared access, with an appropriate allocation of risk
3. If Ofcom does mandate UDPA earlier than 2021, it should not remove usage restrictions in effectively competitive business markets as this could damage competition and investment. Ofcom should stick with mixed usage duct and pole access in these areas i.e. access that is primarily for consumer broadband (and some business) provision
4. If Ofcom does implement UDPA everywhere, it should de-regulate business connectivity markets far more extensively than has been proposed. DPA will materially increase CPs' ability and incentive to deploy fibre to businesses (including within the review period), and this will increase the competition facing Openreach
5. Even if Ofcom is not inclined to give weight to DPA (which is an error) it should not regulate in certain urban areas or the high value business segment as these are already competitive
6. Mandating dark fibre offers no significant benefits and should be deferred until the areas where network competition is likely (and unlikely) are clearer. If implemented now, there is a risk of harm to investment incentives (not least due to a high risk of mis-use)
7. Ofcom materially underestimate the cost of capital. Changes in key parameters with no discernible change in market fundamentals creates an unhelpful regulatory environment when large and long-term investments are in prospect

Removing duct and pole access usage restrictions is premature and cannot be justified in effectively competitive business markets

1.3 There is an extensive duct and pole access requirement on Openreach already, which allows access for (primarily) residential and (some) business services (so called 'mixed usage' duct and pole access). This will go a long way towards meeting Ofcom's investment and competition objectives as it already allows much cheaper access to Openreach's infrastructure and the supply of multiple services over the networks created. Removing usage restrictions completely (as proposed by Ofcom in the PIMR) would allow the remedy to be used (for the first time) to solely target the business segment,[1] without the need to demonstrate a firm intention to deploy consumer broadband.

1.4 Such a substantial change in the duct and pole regime assessment cannot be undertaken without evaluating the need for it across both residential and business connectivity markets. Ofcom accepts this is necessary and has started, but not yet completed, its integrated review. Without an assessment of competition issues through this lens (allowing for appropriate geographic differentiation) the remedy may over-reach in areas where network competition already exists (or is expected due to mixed usage DPA); or it may be irrelevant because there is no commercial case to build additional networks.

1.5 If Ofcom nevertheless goes ahead, the proposed obligation is too extensive and could adversely affect those who have already invested in competitive networks without regulatory help. In business markets which are already effectively competitive, mixed usage DPA is clearly enough – the removal of usage restrictions in these areas cannot be justified.

1.6 Equally, Ofcom has not made the case for limiting its obligation to Openreach. Virgin Media has physical infrastructure that would be attractive to network rivals in many cases (most notably in areas where Openreach's network is not usable by third parties). Virgin Media's narrower footprint is not an issue as ubiquity is not a pre-requisite for competitive investment in fibre infrastructure. Ofcom's proposals also fall short of the Government's ambition to address barriers to the use of non-telecoms infrastructure to promote network competition.

1.7 We assume that any obligation would require Openreach to provide unrestricted access to its duct and poles to address any market power in downstream wholesale fixed access markets (and associated retail markets), as is currently the case for the mixed usage DPA obligation. This is consistent with the legal and economic requirement that upstream remedies relate to downstream competition issues, in this case in the provision of fixed connectivity services in residential and business markets. Use of Openreach's physical infrastructure on regulated terms to host radio transmission / reception equipment to provide wireless connections is out of scope.

[1] Companies offering high-speed lines for large businesses, as well as networks carrying data for mobile operators.

Ofcom must establish enduring DPA pricing principles to ensure fair recovery of the cost of BTs physical infrastructure in the long term

1.8 Principles must be established upfront so that the charging regime for UDPA creates a stable, predictable long term regulatory regime that allows Openreach a fair opportunity to recover the costs of its shared physical infrastructure network (which amount to some [✂] of Openreach's mean capital employed, representing about [✂] of the total asset base in SMP markets). The regime should incorporate the well-established principle that financial risk is not imposed on a regulated entity when is not able to manage the source of the risk. This is to incentivise good management of those risks and avoid a significant financing cost premium if risks are borne which are beyond the management's control. In this case, this principle would mean that Openreach should not bear risks from fluctuations in active volumes in seeking to recover physical infrastructure costs.

1.9 An enduring regime also requires greater clarity on how allowances for network adjustment costs should be established, as well as uncertainty mechanisms to address in-period changes to these expenditures beyond Openreach's reasonable control. In short there is merit in considering a regime more akin to the regulatory asset base 'RAB' framework used in other regulated sectors.

Ofcom's analysis of the business connectivity markets understates actual and potential network competition and therefore over-states Openreach's alleged market power

1.10 There is a lot more competition in business connectivity markets than Ofcom's analysis suggests. Ofcom's analysis does not capture important distinctions between customers (and the nature of their demand) – particularly between the high value/high bandwidth segment and the lower value/low bandwidth segment. For example, competitors to Openreach are prepared to dig (and create new duct) approximately twice as far to serve high value customers (with high bandwidth requirements) than for lower value customers (with lower bandwidth requirements).[2] By aggregating these segments, Ofcom has missed these distinctions, leading to flaws in the assessment of market power which must be re-done.

1.11 In the high network reach 'HNR' Metro areas (across all bandwidths), and the very high bandwidth 'VHB' segment in wider areas, the evidence points to effective competition (even before the impact of duct and pole access is considered). There is already a high level of rival infrastructure within reach of customers in these cases, and this drives competitive outcomes. These can be de-regulated now (irrespective of where Ofcom lands on UDPA). Regulating where there are existing (or emerging) competitive pressures risks stifling innovation and making investment less attractive. This would harm both competition and, ultimately, customers.

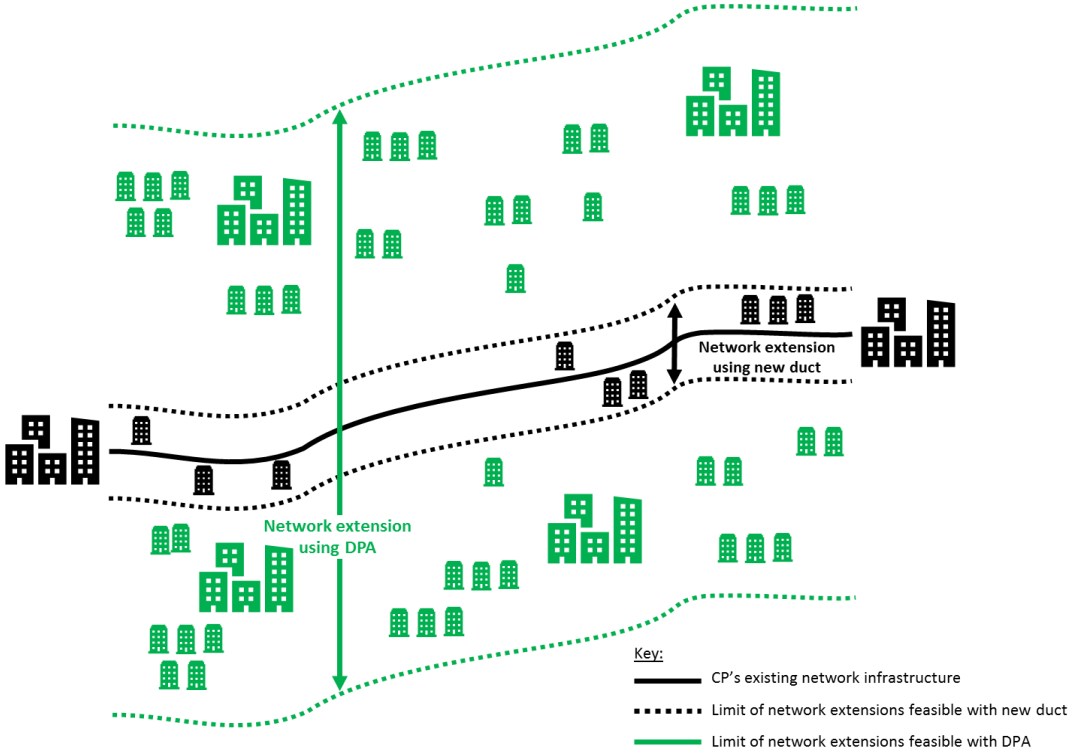
1.12 The current mixed usage DPA remedy will increase competitive pressure still further by materially increasing the ability and incentive of network rivals to deploy fibre. The

[2] Ofcom, 2018. *Business Connectivity Market Review*, 2 November, paragraph 5.18.

removal of usage restrictions (i.e. UDPA) would accelerate this impact by allowing solely business customers to be targeted. This would encourage a much broader range of CPs (who focus on business services) to take up duct and pole access (in addition to the multi-service operators who can already supply business services under the mixed usage regime).

1.13 Access takers (whether those with scale ambition or the business specialists) would face materially different supply economics. Using Ofcom's own model, AlixPartners finds material cost savings from using duct and pole access for business services (e.g. a 70% cost reduction for a 1Gbit/s circuit requiring 100m of duct).[3] This could substantially increase the viable supply distance between a customer site and a rival's infrastructure by a factor of ten (as shown in the illustration below). CPs would have a strong incentive to get to high value customers quickly and secure their business through contracts. Customers are already delaying procurement decisions pending the outcome of PIMR. Ofcom is wrong, therefore, when it concludes that there will be little take up of duct and pole access in this market review.

Figure 1: Stylised illustration of the impact of DPA on CPs' ability to reach business sites



Source: AlixPartners

1.14 Without capturing the game changing effects of both mixed usage and UDPA, Ofcom's market power findings are not robust. Ofcom needs to rectify this and re-consider its proposed remedies, with greater scope for de-regulation and lighter regulation reflecting the competitive pressure that upstream remedies will unleash.

[3] Assuming a 5-year contract.

Openreach and BT need to have commercial flexibility to compete fairly where there is competitive pressure

1.15 Where market power remains, regulation should still allow fair competition between network rivals (including Openreach). Allowing Openreach the flexibility to respond to pressure from infrastructure rivals is critical to the (market-driven) dynamic which ultimately delivers benefits to its customers. This must include the ability to tailor its offerings to the needs of specific customers and customer segments (especially in the VHB segment should Ofcom continue to find SMP) and to differentiate its prices by geography.

1.16 In areas and market segments where network competition is emerging, the obligation to supply on an equivalence of inputs 'EOI' basis, is not required because competition will prevent discriminatory behaviour in favour of BT's downstream businesses. In any event, where it has SMP, Openreach is still subject to the no-undue-discrimination condition; the requirement for prices to be fair and reasonable; to treat all its downstream customers equally in accordance with the BT Commitments ('the Commitments') and general competition law.[4] EOI is disproportionate and may prevent Openreach from fairly responding to competition in order meet the needs of specific customers or customer segments.

1.17 BT's downstream businesses (which are large customers of Openreach) depend on competitive supply by Openreach so that they can compete on a level playing field with their rivals. Regulation should not, therefore, prevent or dis-incentivise Openreach from fairly responding to competition. Equally, we expect our downstream businesses to have the same commercial flexibility as rival CPs in respect of their network supply options. Our downstream businesses will use DPA (and dark fibre if mandated) to deploy networks as necessary to maintain competitiveness (and within the terms of the Commitments).

Dark fibre is not justified over other remedies and may have unintended consequences that are not in customer's interests

1.18 Mandating dark fibre at this stage will not bring any additional benefit beyond remedies already envisaged by Ofcom. It should be put on hold until there is greater clarity on the areas where network competition is likely (and unlikely).

1.19 Aside from design issues, mandated dark fibre is poorly conceived in light of broader industry trends – i.e. the move to a full-fibre future and a lower cost operating model with fewer exchanges. It would be a poor outcome for customers if our transformation plans were delayed, and a poor experience for CPs if they had to subsequently move from exchanges which were closing where they had recently invested in dark fibre.

1.20 Equally, Ofcom cannot yet be sufficiently certain that UDPA will not be effective in promoting infrastructure competition for the routes where dark fibre is proposed. A better (and more proportionate) approach would be to combine UDPA and active

[4] https://www.btplc.com/Thegroup/Ourcompany/Theboard/Boardcommittees/BTComplianceCommittee/Publications/Commitments.pdf

remedies. This would allow the former to reveal more accurately the viable scope of competition, whilst the latter would protect customers where competition is not viable during the two-year transition. This would also be more consistent with Ofcom's policy of only considering dark fibre where UDPA is not effective or available, as well as maximising the scope and incentive for competing fibre build.

1.21 There are also strong arguments against proceeding with the remedy as specified given unintended consequences where dark fibre is strung together to provide a route through competitive areas. All those who have invested in competitive fixed backhaul would be harmed if this gaming opportunity was exploited.

1.22 Finally, if Ofcom does proceed with dark fibre now, it cannot expand the remedy later without a fresh assessment of the costs and benefits (against a counterfactual without dark fibre). Ofcom should not expect that it will be easier to demonstrate proportionality for an expanded dark fibre remedy later simply by imposing dark fibre (and shifting the counterfactual) in the first instance on weak grounds. Ofcom would need to have very solid grounds for extending dark fibre into the access segment given the risk it poses to investment incentives. Even in uncompetitive areas, investment may still be commercial, and regulation will need to be designed carefully to support and bring this forward.

2 Removing duct and pole access usage restrictions is premature and cannot be justified in effectively competitive business markets

2.1 Ofcom wants to promote telecoms network competition by making it cheaper and easier to build new high-capacity business and residential networks. We understand the objective and have indicated our willingness to work with Ofcom to facilitate unrestricted access to our duct and poles.

2.2 But there is an extensive duct and pole access requirement on Openreach already which allows access for (primarily) residential and (some) business services (known as 'mixed usage' DPA). This will go a long way towards meeting Ofcom's investment and competition objectives as it already allows much cheaper access to Openreach's infrastructure, and the supply of multiple services over the networks created. Removing usage restrictions completely (as proposed by Ofcom in the PIMR) would allow the remedy to be used (for the first time) solely to target companies offering high-speed lines for large businesses, as well as networks carrying data for mobile operators (without the need to demonstrate a firm intention to deploy consumer broadband).

2.3 Such a substantial change in the duct and pole regime cannot be undertaken without assessing the need for it across both residential and business connectivity markets. Ofcom agrees that such an assessment is required and has commenced this consolidated review.[5] Without an assessment of competition issues through this lens (allowing a proper assessment of the proportionality of any spill-overs into already or prospectively competitive markets)[6] the remedy may over-reach risking damage to competition, investment incentives and ultimately customers. Ofcom can avoid this risk by sticking with mixed usage DPA until it has undertaken the necessary analysis.

2.4 If Ofcom nevertheless goes ahead, the proposed obligation is clearly too extensive (pending the assessment described above) and could adversely affect those who have already invested in competitive networks without regulatory help. In business markets which are already effectively competitive, the existing mixed usage duct and pole remedy is clearly enough – the removal of usage restrictions in these areas cannot be justified.

2.5 Competitive investment in full fibre networks would have the best chance of success if physical infrastructure access is facilitated more generally (rather than limited to Openreach). Virgin Media has physical infrastructure that would be attractive to network rivals in many cases (most notably in areas where Openreach's network is not usable by third parties). Virgin Media's narrower footprint is not an issue as ubiquity is not a pre-requisite for competitive investment in fibre infrastructure. Physical networks of different sorts (including non-telecoms infrastructure) can be combined to support

[5] Ofcom, 2018. *Physical Infrastructure Market Review*, 2 November, paragraph 1.5 'Over the coming months we intend to set out different elements of our holistic approach to regulation of business and residential markets, which will take effect from spring 2021.'

[6] If Ofcom wishes to intervene upstream of markets which are effectively competitive because it sees this as necessary spill-over to promote investment in multi-service networks (which will serve both competitive and less competitive markets), it must clearly set out the costs and benefits of doing so, ideally with a quantitative assessment. Ofcom has not undertaken such an assessment in the PIMR.

fibre deployment (and the Government has made clear that it wants any barriers to be addressed).

2.6 Any obligation would require Openreach to provide unrestricted access to its duct and poles to address any market power in downstream wholesale fixed access markets (and associated retail markets), as is currently the case for the mixed usage DPA obligation (and consistent with the legal and economic underpinning for such an intervention). Use of Openreach's physical infrastructure on regulated terms to host radio transmission/reception equipment to provide wireless connections is out of scope.

2.7 Principles must be established upfront so that the charging regime for UDPA ensures that Openreach will be able to recover the costs of its physical infrastructure network under different scenarios and does not bear risk that it is unable to manage.

Removing duct and pole access usage restrictions is premature pending Ofcom's integrated review of residential and business markets

2.8 There is an extensive duct and pole access requirement on Openreach already which allows access for (primarily) residential and (some) business services (known as 'mixed usage' DPA). This will be in place until 2021 (and is fully implemented from April 2019). Openreach are seeking to make this a 'best in class' access solution and have made significant progress to this end. Mixed usage DPA will go a long way towards meeting Ofcom's investment and competition objectives as it already allows much cheaper access to Openreach's infrastructure and the supply of multiple services over the networks created (which delivers economies of scope).

2.9 Ofcom now proposes (in the PIMR) to remove usage restrictions completely. This is explained by reference to Ofcom's July 2018 Strategic Policy Position in which Ofcom signalled a need to consider access networks and services more holistically, focusing first on continuing to open up Openreach's physical infrastructure. Ofcom also explained the need for a more holistic regulatory approach recognising that full-fibre networks can supply a range of different services for business and residential services.[7] Ofcom has already commenced this consolidated review of residential and business telecoms markets (as well as physical infrastructure) which will take effect 2021.[8]

Ofcom is seeking to mandate an unrestricted form of duct and pole access before it has undertaken the holistic analysis it says is required (and is doing)

2.10 We agree that a more holistic assessment looking across business and residential markets is sensible. But Ofcom has jumped the gun by seeking to mandate an unrestricted form of duct and pole access before it has undertaken the holistic analysis it says is required (and is doing).

2.11 To regulate access to physical infrastructure, Ofcom must show that competition

[7] BCMR 2018 Consultation, para 2.5-2.9, '…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.' (para 2.6).
[8] BCMR 2018 Consultation, para 1.4.

problems in defined retail markets[9] arise due to Openreach's control of physical that infrastructure.[10] Or, more simply, Openreach faces insufficient competition from other telecoms operators (with their own physical infrastructure or using alternatives)[11] to deliver good outcomes for customers in the relevant retail markets.[12]

2.12 Absent a holistic review, Ofcom relies on its analysis in the 2018 BCMR Consultation and the 2018 Wholesale Local Access 'WLA' Statement (which concluded a market review in 2017) to show that Openreach has SMP in relevant wholesale markets and that 'BT's control and ownership of its physical infrastructure' is a 'key source of its market power'.[13] But these reviews (which are distinct in their focus as well as their timing) do not provide the basis for a finding that Openreach has market power nationwide through the control of its physical infrastructure when business and residential market are considered together.

2.13 Ofcom attempts to address this shortcoming by asserting that multi-service networks '*supplying the full range of downstream services to most premises within an area*' will become the '*predominant*' business model.[14] But an (un-evidenced) belief in a particular business model is not a substitute for a proper (holistic) analysis of retail markets, and is not an objective basis on which to define a new upstream market or justify remedies which extend into competitive markets. Nor has Ofcom given itself the opportunity to consider recent market developments and the implications of a geographically differentiated approach (again looking across residential and business markets).[15]

Ofcom's piecemeal and discontinuous (rather than holistic) approach means that it misses key market developments

2.14 Ofcom has not considered key market developments which provide important information on Openreach's alleged market power and therefore the remedy that may be required to deliver good outcomes for customers.

2.15 Specifically, Ofcom has ignored a major change in the wholesale local access market arising from [✂]. Openreach responded with its fibre deal which offers all CPs a discount if they can grow their fibre broadband customer base on Openreach's superfast or ultrafast network by an agreed proportion over a 3 or 5-year period. This means that wholesale superfast prices are potentially lower than the cap set by regulation for CPs who can meet the relevant volume requirements.

[9] European Commission Recommendation on relevant product and services markets of 9 October 2014 (C(2014) 7174), paragraph 7.

[10] And that the Three Criteria test as set out the European Commission is satisfied. See European Commission Recommendation on relevant product and service s markets of 9 October 2014 (C(2014) 7174), paragraph 11 *et seq*.

[11] Also referred to in Ofcom's analysis as 'indirect constraints'.

[12] Previously, Ofcom has only imposed wholesale remedies on Openreach following an analysis showing that it has significant market power ('SMP') in the delivery of services which are needed as inputs to defined retail services that would otherwise not be competitively supplied. The same analytical approach must apply in assessing the need to intervene at the physical infrastructure level.

[13] PIMR 2018, para 3.97.

[14] PIMR 2018, para 3.17.

[15] PIMR 2018, para 3.98. Ofcom acknowledges that markets change. It states '…we are mindful that the telecoms sector is dynamic, with continually evolving demand and supply, driven by innovation in technology and end-user services and changes in consumer preferences'.

2.16 This points to a market-driven constraint on wholesale prices (and – indirectly – on prices for physical infrastructure inputs) as well as significant countervailing buyer power. Ofcom acknowledges that such a constraint is possible[16] but has not treated the price reductions (and the circumstances in which they were offered) as strong evidence of this constraint. It does not mention the episode at all, even though it is a game changer with significant implications for the assessment of market power.

2.17 These events clearly show that Openreach has been obliged to compete (fairly) in the wholesale local access market [✂].

2.18 Openreach's control of its physical infrastructure is not a source of market power where [✂]. It certainly cannot be assumed that BT has 'enduring' SMP at the wholesale level, and this brings into question any inferred market power upstream.[17]

2.19 The Openreach fibre deal will deliver lower prices to CPs (and their end customers) due to competition between two large entities – BT and Virgin Media - each with their own physical infrastructure. And there are other competitors (such as Gigaclear) with ambitious plans who have grown (to date) by using innovative and low-cost methods for laying their own fibre (such as narrow trenching).[18]

2.20 There is a strong case, in light of these developments, to pause before mandating unrestricted duct and pole access (leaving mixed usage DPA in place) to allow Ofcom, as part of its integrated market review, to fully assess and take account of relevant market developments. It could then assess (with full information) the competitive constraints on Openreach from existing network rivals (and their likely developments) as well as how well this competition is delivering good outcomes for end customers.

2.21 This would ensure that any UDPA remedy could be properly and proportionately targeted on areas where objective assessment would show Openreach as having market power, and where mixed usage has not been (and is unlikely to be) effective in addressing it.

If UDPA is mandated earlier, there is no justification for broadening the remedy beyond what currently exists in business markets that are already competitive

2.22 If UDPA is mandated earlier (without the required holistic market analysis) there is no justification (or legal basis) for broadening the remedy beyond what currently exists (i.e. mixed usage DPA) in business markets that are already competitive. Regulating where there are existing or emerging competitive pressures risks stifling innovation and making investment less attractive. This would harm customers in the longer run.

2.23 Even though access to Openreach's ducts and poles has not been available for specific business purposes, a lot of rival network (focused on leased lines) is present in certain areas, creating enough choice for business customers that Ofcom is satisfied the market

[16] PIMR 2018, para 3.136.
[17] PIMR 2018, para 3.146.
[18] https://www.gigaclear.net/gigaclear-signs-international-contractor-lite-access-technologies-to-deliver-full-fibre-broadband-to-west-oxfordshire

is competitive. The Central London Area 'CLA' is considered by Ofcom to be effectively competitive in certain wholesale (and we presume associated retail[19]) markets. The other HNR Metro areas should also be found to be effectively competitive given the high density of physical infrastructure within reasonable reach of customers in these areas (as set out in section 3).

2.24 If network competition already exists (and is delivering well for customers in retail markets as in the CLA), then making subsequent entry easier may have unintended consequences. Returns on investment for the first movers will be less certain and investment incentives may be undermined, which would not be good for customers.

2.25 To address this, Ofcom should retain the requirement that duct and pole access is used primarily for consumer broadband (i.e. mixed usage DPA) in geographic areas where the supply of business connectivity is found to be effectively competitive, to avoid regulating where this is not required, and to avoid the attendant risk of distorting competition unnecessarily in those areas.

Alternative network investment is more likely to be facilitated if there are viable options for accessing physical infrastructure more generally (i.e. not just Openreach's infrastructure)

2.26 As discussed above, physical infrastructure cannot act as a source of market power where there is enough of it in the hands of rival telecoms operators to deliver competition in retail (or wholesale) markets and good outcomes for customers (for example in certain business markets). But for any remaining pockets of concern, competitive investment in full fibre networks would have the best chance of success if physical infrastructure access is facilitated more generally (rather than limited to Openreach). In many cases, it is not clear that Openreach has distinct advantages from control of its physical infrastructure over other owners of physical infrastructure.

2.27 Ofcom's reasoning is as follows:

- First, non-telecoms physical infrastructure is not seen as an '*attractive alternative to infrastructure that has been specifically built for scale deployment of telecoms networks*',[20] (except in isolated cases which are costly to address where non-telecoms infrastructure may be used as an 'add-on' to a scale deployment). Ofcom cites various reasons why using such infrastructure at scale is either not viable or involves higher cost and operational complexity. It is, Ofcom provisionally concludes, a '*poor substitute*' for telecoms physical infrastructure, and so is outside the relevant product market.[21]
- Second, although non-BT telecoms infrastructure is included in the relevant product market (so exercises a competitive constraint to some extent) it is not judged by Ofcom to be an effective competitor to BT in the geographic areas

[19] There is no retail market analysis in the 2018 BCMR Consultation.
[20] PIMR 2018, para 3.35.
[21] PIMR 2018, para 3.38.

where they overlap (as BT is deemed to have SMP).[22] Virgin Media (Ofcom says) lacks the ubiquity of BT's physical infrastructure and cannot match the cost and capacity advantages of BT's lead-in infrastructure.[23] Alternative infrastructure used for leased lines (Ofcom says) would not be attractive to an access seeker wishing to deploy a multi-service network and, in any event, would be higher cost and limited to high network reach areas.[24]

2.28 Ofcom reaches these provisional conclusions by considering the relative attractiveness of product characteristics[25] primarily to a specific type of user, namely, those building multi-service networks at scale.[26] Little reference is made to different business models (e.g. business focused),[27] nor to actual usage of physical infrastructure (in the UK and other countries), nor is it clear that Ofcom has systematically asked users for their views.[28]

2.29 We disagree with the advantages claimed by Ofcom in respect of Openreach's physical infrastructure. Contrary to Ofcom's reasoning, the evidence below suggests that Openreach will face effective competitive constraints from alternative infrastructure in many cases. To the extent access obligations are required, it is not clear that Ofcom's objective to promote competitive fibre investment is best met by a narrow BT-focused intervention. A more holistic consideration of physical infrastructure is required (as indicated by the Government as part of the Future Telecoms Infrastructure Review).[29]

Case studies indicate that non-telecoms physical infrastructure may be viable in more than isolated cases

2.30 Evidence of non-telecoms physical infrastructure being used in the provision of telecoms services is set out in the Openreach PIMR submission and the attached Analysys Mason report (the 'AM report'). The AM report identifies nuances in the

[22] Ofcom does not explore the competitive constraint from Virgin Media as part of its market definition because it starts with a focal product that includes all telecoms physical infrastructure. It can be inferred, therefore, that Ofcom considers Openreach and Virgin Media to be competitors but not effective competitors.

[23] PIMR 2018, para 3.110-3.119.

[24] PIMR 2018, para 3.121-3.123.

[25] It is a long-established principle of market analysis (for regulatory or competition law purposes) that product characteristics are not enough, on their own, to determine market distinctions or competitive constraints. (see, for example, European Commission Recommendation on relevant product and services markets of 9 October 2014 (C(2014) 7174). There is no substitute to understanding demand and how product characteristics influence product choice (as well as price/quality trade-offs). Ofcom accepts this point (PIMR, footnote 20) but has still not undertaken a robust analysis of demand.

[26] We don't think that regulation should be designed to support a 'predominant' business model (namely, scale deployment by multi-service operators). Regulation should promote competitive processes and not favour the interest of particular competitors. Ofcom's duties refer to the promotion of competition generally and not the protection of specific competitors - see the Communications Act s3(1) and 3(4). Further, competition law, the principles of which underpin the SMP regulatory regime, is focussed on the protection of the competition process (acknowledging that, for example, inefficient competitors should be allowed to fail and not protected).

[27] We would expect CityFibre (a multi-service operator with scale ambitions) to have very different preferences to Colt (a business specialist), particularly on issues such as the importance of ubiquity (which users with more targeted plans will be less concerned about).

[28] Ofcom says that it has '*engaged with a range of potential access seekers to understand the importance of different characteristics affecting the suitability of different types of physical infrastructure*', PIMR, para 3.22. But this does not constitute a comprehensive assessment of demand. Ofcom does not set out the number of access seekers asked for input, their type, nor the substance of their submissions. Without such evidence, Ofcom's statements (for example, that access seekers combine self-build and alternative infrastructure for reasons of '*necessity, rather than preference*' PIMR, footnote 85) can be treated as assertion.

[29] DCMS, 2018. *Future Telecoms Infrastructure Review*, page 6.

suitability of different types of infrastructure which Ofcom's broad-brush assessment has missed.

2.31 Low voltage electricity infrastructure is highlighted by AM as having been used successfully in the deployment of full fibre networks. Several international case studies are cited including the SIRO joint venture in the Republic of Ireland between Vodafone and ESB, and the Enel/Open Fibre partnership in Italy. In the UK, the report gives the example of TrueSpeed which has recently signed a deal with WPD to use its electricity network for FTTP deployment with the aim to reach 75,000 premises.

Network ubiquity is not a prerequisite for competition

2.32 Ofcom explains the importance it attaches to ubiquity as follows:

'*Telecoms networks are built to connect to premises, or sites. Therefore, the ability to connect to as many residential premises or business sites within a deployment area as possible, and the flexibility and certainty to be able to provide any connection in the future quickly and without significant additional connection cost, is important to access seekers*.'

A ubiquitous telecoms physical infrastructure (both in terms of the overall coverage it provides, and the contiguity of that coverage within a particular area) provides this. Combining multiple infrastructures to provide the same level of connectivity introduces additional cost, time and operational complexity, which is likely to lead access seekers to prefer use of a single telecoms physical infrastructure where possible.'[30]

2.33 Ofcom also notes that combining self-build and alternative infrastructure (i.e. not relying exclusively on a single physical infrastructure) may be undertaken in some cases but '*in general, this is based on necessity, rather than preference*.'[31]

2.34 Contrary to these assertions, the evidence suggests that ubiquitous coverage is not critical to competition and that network rivals can compete effectively without going to every premise or site in an area.

2.35 It is commonplace for suppliers to enter and operate successfully in telecoms markets without being ubiquitous.[32] In fact, operators often choose to target the most profitable customers and geographic areas, or are prepared to 'mix and match' self-build with wholesale inputs if they are seeking wider coverage.[33] Entry on such a basis has been successful both in the UK and in other countries.

[30] PIMR 2018, para 3.106-3.107.

[31] PIMR 2018, footnote 85. Ofcom support this by quoting the view of only one operator (PIMR 2018, Annex 8, footnote 250).

[32] Economic theory allows for the possibility that a rival can exercise a competitive constraint without contesting all of the same customers provided that the activity to win customers and gain a network position puts sufficient competitive pressure on existing firms. This is typically the case where there is uncertainty over the precise customers that are contestable in this way, resulting in a pricing constraint across all customers.

[33] Ofcom has already reflected this in business markets by defining distinct geographic markets. Put simply, rivals target their infrastructure build in particular areas where the economics are favourable – they don't seek to achieve ubiquity nor is this required for them to compete successfully.

- Virgin Media's coverage, for example, is materially less than 100% in the UK suggesting that ubiquity is not central to its commercial model and this has not proved a barrier to commercial success in areas where it operates.
- Smaller operators such as Hyperoptic, CFL and TrueSpeed have also successfully adopted targeted strategies in the UK, as have business specialists such as Colt, and Zayo.
- Even operators with scale ambitions (such as CityFibre) are unlikely to cover entire urban areas (as observed in the AM report).

2.36 Equally, providers often successfully adopt a mixture of deployment options (including self-build, as well as seeking access, potentially to multiple physical infrastructures) to meet both cost and differentiation objectives (for example adopting differentiated network designs and using innovative civil engineering techniques to reduce deployment cost).[34] The AM report comments that a 'mix-and-match' approach could potentially lead to innovation from potential access seekers, a competitive benefit that may not have been recognised by Ofcom.'[35] Such benefits would need to be weighed against any additional cost, time or operational complexity of adopting such a strategy before concluding that these were barriers (an analysis which Ofcom has not done).

2.37 These suppliers do not need to rely on one physical infrastructure network to address all their customers. Other utility infrastructure networks offer clear alternatives to BT's network as in the case of TrueSpeed's arrangement with WPD. As AM show, it is also clear that breaking in and out of different networks has been overcome in a number of instances and does not constitute a significant barrier to entry.

2.38 In placing so much weight on ubiquity, Ofcom also discounts a role for the Access to Infrastructure Regulations,[36] which are due to be reviewed in 2019 (as set out by the DCMS in the Future Infrastructure Market review).[37] Such regulations clearly show the potential value in the use of 'mix and match' deployment options. More generally, the Government has made clear that it would like to see any barriers to the use of non-telecoms infrastructure addressed (including by Ofcom working with the other sectoral regulators).[38]

2.39 The evidence does not, therefore, indicate that competition requires access to a single ubiquitous physical network, and a preference amongst users for access on this basis (if it does exist) is not sufficient to find market power.

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[34] It is possible to differentiate a service through the architecture of the underlying physical infrastructure (particularly for business services) and this drives incentives to self-build rather than be tied to the architecture of existing physical infrastructure. Innovation in civil engineering techniques can make self-building economically viable. Ofcom has celebrated such innovation saying 'micro-trenching and slot-trenching enables narrower digging of trenches to lay micro-ducts which fibre can then be blown into, significantly reduced the time and cost of digging and repairing the carriageway', para 3.9 and footnote 31, https://www.ofcom.org.uk/__data/assets/pdf_file/0008/101051/duct-pole-access-remedies-consultation.pdf.

[35] Ofcom find that 'mix and match' usage '*is based on necessity rather than preference*' but Ofcom support this by quoting the view of only one operator (PIMR 2018, Annex 8, footnote 250).

[36] http://www.legislation.gov.uk/uksi/2016/700/pdfs/uksi_20160700_en.pdf

[37] DCMS, 2018. *Future Telecoms Infrastructure Review*, p.6

[38] DCMS, 2018. *Future Telecoms Infrastructure Review*, pp. 6 and 253, '*Ofcom should work collaboratively with other regulators to ensure that multi-utility passive sharing opportunities are explored, and barriers addressed*.'

Differences in lead-in costs on which Ofcom relies have not been demonstrated

2.40 Ofcom also points to differences in lead-in costs between BT and Virgin Media as a justification for finding BT to have SMP in areas where they compete. Specifically, Ofcom asserts that lead-ins from Virgin Media's network would be more expensive for third parties than using Openreach's lead-ins.

2.41 However (as set out in detail in the AM report) Virgin Media's deployment approach means that lead-in lengths are considerably shorter.[39] Overall, there is no evidence that there is likely to be a material difference in connection costs per premise between Openreach and Virgin Media, nor that any such difference (if its exists) is material relative to the value at stake.[40] Nor does Ofcom explain why Virgin Media has not been impeded by these alleged disadvantages. In fact – as discussed above, it competes effectively with rivals using its own physical infrastructure (which it has been extending).

2.42 As pointed out by Openreach in its submission, in some parts of the country Openreach cables are directly buried and therefore not suitable for sharing and, further, there are geographies in which Virgin Media has duct and Openreach does not.

A 'one size fits all' approach to physical infrastructure access will not deliver Ofcom's objectives

2.43 There are nuances in whether access to physical infrastructure (without restriction) is required to promote infrastructure competition and better outcomes for customers. Ofcom's 'one size fits all' proposal risks undermining incentives of operators to differentiate and innovate which would not be in the interests of final customers.[41]

2.44 There is no case for going beyond a mixed usage form of DPA in effectively competitive business markets. In fact, the case for going beyond mixed usage now, rather than in 2021, more generally is weak given that Ofcom has not analysed key market changes which indicate a high degree of existing infrastructure competition.

2.45 Where access is required, Ofcom has not justified loading these obligations on Openreach nor is this the best way of promoting competitive fibre investment (which is Ofcom's policy objective). We disagree with the advantages claimed by Ofcom in respect of Openreach's physical infrastructure (particularly vis-a-vis Virgin Media). The evidence indicates that Virgin Media's physical infrastructure is much more suitable for fibre deployment than suggested by Ofcom.

2.46 It is very likely that altnets (and indeed Openreach) would value access to the Virgin Media infrastructure to reduce costs of fibre deployment and support plans for bringing ultrafast services to customers quickly and widely in the years to come. There is no reason, therefore, why Virgin Media should not have some form of obligation to provide access to its infrastructure where it passes customers' premises. It is also unclear that

[39] Virgin Media's network is built much closer to the customer premises (usually from the kerb) than Openreach's (where [✂] of premises are served by Openreach from a nearby pole).

[40] For valuable business sites, any lead-in cost difference (were they to be substantiated) will not be large relative to value.

[41] Equally, regulatory best practice requires targeting intervention to where it is needed and avoiding imposing regulatory burden where unnecessary Communications Act, s3(3) and s6.

Ofcom's proposals go as far as the Government would like in addressing any barriers to the use of non-telecoms infrastructure as highlighted in the Future Telecoms Infrastructure Review.

Unrestricted access to Openreach's physical infrastructure (if implemented) would be available to address any market power in downstream fixed markets

2.47 Any obligation would require Openreach to provide unrestricted access to its duct and poles to address any market power in downstream wholesale fixed access markets (and associated retail markets), as is currently the case for the mixed usage DPA obligation (and consistent with the legal and economic underpinning for such an intervention).

2.48 This is consistent with Ofcom's strategic objective to enable more fibre investment by alternative providers and by Openreach.[42] Giving unrestricted access to Openreach's ducts and poles is intended to give 'greater flexibility to lay fibre networks that serve residential or business customers'.[43] It is clear, therefore, that Ofcom wishes to facilitate (through regulated access to BT's physical infrastructure) deployment of the fibre elements of telecoms networks not deployment of telecoms network of any description.

2.49 Use of BT's physical infrastructure on regulated terms to host radio transmission / reception equipment to provide wireless connections is therefore out of scope. Ofcom cannot impose regulation to facilitate the deployment of wireless connectivity which forms an input to downstream retail markets where Ofcom has not identified consumer harm.[44]

2.50 In any event, there can be no suggestion that Openreach has any enduring advantage in this context, as providers of wireless connectivity can host such equipment on dedicated masts (e.g. mobile cell site masts), municipal street furniture (e.g. lamp posts), or buildings. Equally, Openreach does not have a unique or ubiquitous 'overhead network' suitable for mobile operators.

2.51 Nor would it be proportionate to expect Openreach to undertake potentially costly 'network adjustments' for mobile networks given the large number of sites which 5G might require, and the fact that such network enhancements would not be of shared value to other users (as Ofcom has argued is the case for network adjustments required for the deployment of fixed networks). Mobile operators should be responsible for the network costs that their services entail, and these cannot be passed through to customers of fixed suppliers (with Openreach waiting 40 years until it recovers its

[42] PIMR 2018, para 1.2.

[43] PIMR 2018, para 1.4.

[44] Ofcom has previously found wireless access services to be outside of the market for local fixed access connections including copper/fibre or cable connections (WLA Statement, March 2018, para 3.115). In its most recent assessment of mobile markets, Ofcom found competition in mobile retail markets to be functioning well. Ofcom states '*having looked at competition in the UK mobile services sector today, we consider that the current provision of mobile services is functioning well, with competition between the four MNOs delivering good outcomes for consumers*', para 5.17 https://www.ofcom.org.uk/__data/assets/pdf_file/0019/130726/Award-of-the-700-MHz-and-3.6-3.8-GHz-spectrum-bands.pdf

costs).[45]

The regime for regulating physical infrastructure should provide long-term stability, predictability and a fair opportunity for Openreach to recover efficiently incurred costs

2.52 Certainty is important for BT as the owner of the assets which Ofcom is proposing that Openreach sells access to. Sharing of BT's physical infrastructure on regulated terms reduces the cost and risk of building full fibre networks, allowing active services to be offered competitively by rival networks. Following this logic, it is Ofcom's intention that, over time, rival full fibre networks (facilitated by physical infrastructure sharing) will compete more effectively for the current volumes of Openreach's active services.

2.53 In this context, a long-term view is needed of the sustainability of duct and pole pricing. If full fibre competitors are particularly successful in winning volumes of active services from Openreach, then two possibilities arise. First, overall occupancy levels might decline if new network providers displace Openreach in the market for active services and require less use of physical assets than Openreach in the supply of these services. For cost recovery, Openreach would then need to raise its active prices to increase its notional contribution to physical infrastructure costs but, in doing so, make itself less competitive. Second, Openreach may set active prices to allow itself to compete but, in doing so, it may not recover costs across both levels of the value chain taken together. No actions available to Openreach will allow it to recover costs.

2.54 The duct and pole pricing regime should ensure that cost recovery is not sensitive to these dynamics. In other words, whatever happens to Openreach's share of active services, there should be a fair opportunity for Openreach to recover the efficiently incurred costs of providing shared access to its physical infrastructure. Openreach should not bear risks from fluctuations in active volumes in seeking to recover physical infrastructure costs. This is a principle that Ofcom should state up-front so that this aspect of regulatory risk can be mitigated, and so that DPA access takers are aware that the regime operates in this way. If Ofcom does not abide by this principle, it would allocated a risk to Openreach that it is not well placed to manage, in turn resulting in a premium on financing costs, and higher prices for duct and pole access than would be the case under a regime which only allocated to Openreach those risks it could reasonable manage.

2.55 Openreach is obliged to fund network adjustment costs (up to a financial limit) to make the shared physical infrastructure asset usable. A forecast allowance is made for this cost and added to the regulatory cost base. Ofcom notes that this could reach around £700m if entrants achieve a 40% share.[46] A regime where Openreach invests in shared infrastructure at the behest of competitors and where these costs (and existing assets)

[45] A further concern is that the DPA regime could add to unnecessary costs being incurred if it were to result in a requirement for Openreach to provide capacity relief and/or adjust its existing infrastructure when alternative non-telecoms infrastructure is available and suitable for network operators to use. The DPA regime should not crowd out the use of such infrastructures and require the unnecessary duplication of physical networks which customers will ultimately need to fund.

[46] PIMR 2018, footnote 186.

are recovered over a 40-year life, requires a more enduring regulatory framework which allows risks (for example technology risk) to be allocated appropriately.

2.56 As part of the establishment of an enduring regime, a mechanism is a required for addressing in-period changes (for example in network adjustments expenditure) beyond the reasonable control of Openreach management (e.g. a trigger for intervention where actual and forecast expenditure diverge beyond agreed tolerances and 'true up', which should include any additional financing costs incurred as a result).

2.57 This regime would need to be specified in advance of the implementation of the consolidated review in 2021. And the features of the regime should form part of Ofcom's consultation in the run up to 2021.

3 Ofcom's analysis of business connectivity markets overstates BTs market power

3.1 We set out in this section why Ofcom has underestimated the degree of competition in business connectivity markets. Even before considering the impact of physical infrastructure access:

- Ofcom has not made the case that Openreach has SMP in the HNR Metro areas; and
- Ofcom has not demonstrated that Openreach has SMP in the VHB segment in many additional areas.

3.2 In the business connectivity markets downstream of physical infrastructure, an analysis of demand and supply factors points to clear differences in competitive conditions between services at 1Gbit/s and below, and the VHB segment. Taking these differences into account, there is a lot more competition in business connectivity markets than Ofcom's analysis suggests.

3.3 VHB customers are larger, higher value and tend to buy through tenders and long-term contracts. Ofcom's own analysis shows that competitors to Openreach are prepared to dig (and create new duct) approximately twice as far to serve these customers than for lower bandwidth customers.[47] The evidence points strongly to a highly contested VHB segment (particularly in the HNR Metro areas), and a lower bandwidth segment which will increasingly be cannibalised by FTTP (which will also develop, first, in areas of high population density).

3.4 These findings underpin our assessment in section 2 that Ofcom has not made the case for removing (completely) the usage restrictions on duct and pole access in these competitive areas and segments.[48]

3.5 If, notwithstanding this, Ofcom were to introduce UDPA everywhere, then it must properly reflect the increased competitive pressure that this will unleash in business connectivity markets. Ofcom does not, however, do this: it gives no weight to the competitive impact of DPA (either mixed usage or UDPA) in its market definition analysis, and there is only a very limited consideration in its assessment of market power.

3.6 This is an error because DPA will materially increase CPs' ability and incentive to deploy fibre (including in the time-period of this market review), and this will materially increase the competitive constraints on Openreach. The existing mixed usage DPA remedy already allows businesses to be targeted (provided an intent can be shown to deploy to consumer broadband at some point). The removal of usage restrictions (i.e.

[47] Ofcom note that the maximum economic dig distance for VHB services is significantly longer than for lower bandwidth services giving the example of a 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 Ofcom says it is 95m. BCMR 2018 Consultation, paragraph 4.57.

[48] If, as we suggest in section 2, Ofcom did not remove the duct and pole usage restrictions in markets which are effectively competitive (but kept mixed usage DPA) then HNR Metro areas should still be deregulated as well as VHB across a larger geographic footprint. Beyond these areas, where Ofcom might impose DPA (without restrictions), we expect competition to be more intense allowing the areas where competition is considered to be in prospect to be defined more broadly.

UDPA) would accelerate this impact by allowing solely business customers to be targeted, thereby attracting a much broader range of CPs (who a focus on business services) to take up duct and pole access (in addition to the multi-service operators who can already supply business services under the mixed usage regime).

3.7 Access takers would face materially different supply economics. Using Ofcom's own model, AlixPartners finds material cost savings from using duct and pole access for business services (e.g. a 70% cost reduction for a 1Gbit/s circuit requiring 100m of duct).[49] This could substantially increase the viable supply distance between a customer site and a rival's infrastructure by a factor of ten.[50]

3.8 CPs have been gearing up to consume mixed usage DPA for some time (as it was mandated as part of the WLA Statement in 2018 with full implementation in spring 2019). Given the cost savings available, CPs have strong incentives to get to high value customers quickly, and secure their business through contracts. Customers are already delaying procurement decisions pending the outcome of PIMR. The active engagement of CPs in DPA implementation progress meetings (attended by CP CEOs, hosted by Ofcom and chaired by Sharon White) suggests a high degree of interest and readiness. Ofcom is wrong, therefore, when it concludes that there will be little take up of duct and pole access in this market review.

3.9 Without capturing the distinct dynamics of the HNR Metro areas and the VHB segment, as well as the game changing effects of DPA (mixed usage as well as UDPA), Ofcom's market power findings (which are not sufficiently forward looking and do not appear to meet the three criteria test) are not robust and must be revised.[51] Its proposed remedies are also not robust: they are not required in areas where effective competition exists now, and lighter regulation is appropriate where it is likely to emerge in the next two years. Regulating where it is not required will interfere with the dynamics of infrastructure competition which Ofcom expects to deliver benefits for customers.

There are clear differences in competitive conditions (between geographies and bandwidths) which reflect the characteristics of end customer demand

3.10 The competitive landscape for business connectivity – now and looking forward – reflects demand characteristics for different types of customer.[52] Competition conditions are influenced by customer size and value, purchasing behaviour,

[49] Assuming a 5 year contract.

[50] To illustrate, Ofcom's model indicates that the one-off cost of providing a 1Gbit/s circuit which requires 100 metres of new duct construction is £11,000 in present value terms over five years, but only £2,300 if the duct is already in place.

[51] Furthermore, the EU Recommendation on relevant markets notes that markets may justify regulation ex ante where '*market structure does not tend towards effective competition within the relevant time horizon*.' https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014H0710&from=EN. In section 4 we also consider the third criterion, sufficiency of ex post competition law.

[52] Ofcom has not explored the drivers of competition from the bottom up by undertaking an analysis of the downstream retail markets (and segments), notwithstanding that the correct approach is to start the market analysis by considering the dynamics in the retail market (see European Commission Recommendation on relevant product and services markets of 9 October 2014 (C(2014) 7174), paragraph 7).

site/demand clustering, and migration patterns (as set out in greater detail in the Openreach response to the BCMR consultation).[53]

3.11 These features, together with other evidence on the functioning of the market, point to (at least): (i) a competitive VHB segment; and (ii) a lower bandwidth market which will be increasingly cannibalised by ultrafast broadband.[54]

3.12 In the same vein, the geographic markets associated with a (properly defined) VHB market and the (separate) lower bandwidth market (i.e. 1Gbit/s and below) are also likely to be distinct, reflecting how different demand characteristics drive different build incentives.

Demand characteristics in the VHB segment drive intense competition underpinned by buyer power

3.13 Customers with demand above 1Gbit/s (typically MNOs, very large businesses and data centre providers)[55] tend to be sophisticated and well-funded. They issue tenders or engage in a dedicated search for infrastructure partners to provide their connectivity requirements. This means long-term contracts and partnerships are favoured, whereby lower prices can be secured by helping to de-risk investment by the infrastructure provider (for example, investment in physical infrastructure to connect a site, and where DPA is used, investment in fibre).

3.14 Customers will factor foreseeable price reductions (due to DPA and increased infrastructure competition more generally) into their purchase decisions, potentially delaying a tender if a cost reduction opportunity is anticipated (see evidence below). Equally, business lost in this context cannot be quickly won back because of the long-term nature of these contracts.[56]

3.15 Such large-scale long-term commercial agreements can drive fierce price competition given the 'all or nothing' nature of such transactions. CPs do not know the precise network locations of their rivals, and this uncertainty can also drive keen pricing as providers factor in the chance of losing a bid, even where the risk is low in reality.

3.16 Examples (in the public domain) of the types of supply arrangements for these customers include: (i) supply of mobile backhaul to Three and O2 using a combination of SSEs existing fibre ring, Openreach exchanges and Thames Water's sewage

[53] As Ofcom also indicates in Chapter 3 and Annex 7 of the 2018 BCMR consultation that there is a very wide range of services sold in wholesale and even more so retail markets all enabled by similar infrastructure. Indeed, in business markets downstream of DPA we observe differences in price by a factor of 1000 from lowest to highest in business markets; compared to a factor of perhaps three at most in consumer broadband. It would be very surprising if a hypothetical monopolist could not make a profit by grouping customer segments within this very wide range in business markets.

[54] There may be additional distinctions for example between MNO backhaul and other business access within the business access market as set out in the Openreach response to the BCMR consultation.

[55] Ofcom has appropriately deregulated data centres reflecting the demand and supply conditions which drive high levels of competition. There are many other high value sites with very high bandwidth demand (including CP nodes, and sites with enterprises in the financial services and broadcast sectors as well as MNO sites) that are competitively supplied in the same way and should be treated accordingly.

[56] This also means that the benefits of competition (for example, from a switch to a CP using duct and pole access away from Openreach Ethernet) would be locked in for some time.

network;[57] (ii) supply of high-density fibre and duct network to Kao Data's datacentre campus in London by euNetworks;[58](iii) supply of a long distance fibre ring by Zayo to multiple customers; [59](iv) fibre supply to Arqiva's neutral host network by CityFibre (a scale pilot at this stage)[60] and a similar self-deployment of fibre by WIG with O2 as the anchor customer;[61] and (v) supply of dark fibre to Google in St Pancras by altnets. It is likely that the duration of the contracts in all of these examples is in excess of 3-5 years and sometimes longer – in particular for MNO backhaul.

3.17 In addition, [✂].

3.18 Examples confidential to BT's downstream business divisions are provided in the text box below.

[✂]

<u>Demand in the lower bandwidth segment at 1Gbit/s and belowmarket is characterized by less buyer power, more standardised products and increasing substitution from FTTP</u>

3.19 Demand in this segment is more fragmented and 'off the shelf' products are more common. 'Internet Access' solutions for enterprises and SMEs (e.g. external communications and connectivity to public cloud and Data Centres) can also be contested by operators with FTTP products targeted at residential customers. In addition, software-based technology (such as software-based wide-area networks) is expected to increase the extent of existing competition from vendors and players without assets.

3.20 Lower bandwidth demand also comprises private connectivity between enterprise sites requiring high performance and availability ('site connectivity'). These customers will increasingly embrace hybrid networks combining IPVPN (a form of private network that is software based so does not require a leased line[62]) with internet access. At the retail level, customers with multi-site requirements can be (and are) supplied by a range of

[57]http://www.threemediacentre.co.uk/news/2018/three-uk-sse-enterprise-telecoms.aspx; https://www.ispreview.co.uk/index.php/2018/09/sse-enterprise-telecoms-three-uk-and-o2-grow-london-fibre-network.html; https://www.ispreview.co.uk/index.php/2018/07/sse-enterprise-telecoms-unbundle-177-more-bt-exchanges-in-the-uk.html

[58] Kao Data is the UKs leading entrant to the wholesale co-location market. The new infrastructure is advertised as providing unique routing opportunities, taking advantage of Harlow's 'strategic' location between Dublin and Amsterdam. It also offers fast connection to Slough, to the West of London, and Docklands in the East of London https://www.globalbankingandfinance.com/kao-data-invests-in-eunetworks-high-density-fibre-as-part-of-a-north-london-artery/

[59] In November 2018, Zayo announced that it is extending and upgrading a new long haul fibre ring in the UK to enable multiple tenants to traverse the country via the most direct, low-latency paths. https://investors.zayo.com/news-and-events/press-releases/press-release-details/2018/Zayo-Expands-and-Upgrades-Long-Haul-Fiber-in-the-UK/default.aspx

[60] Arqiva have recently announced a scale pilot (claimed to be UK's largest) neutral host network in Hammersmith & Fulham. Their network will have over ninety equipment cabinets connected using 15km of fibre provided by CityFibre. Arqiva say they will deploy a centralised C-Ran architecture and 5G. The network uses street furniture drawn from their wireless city concession contract with Hammersmith & Fulham, which was signed in 2014. https://www.arqiva.com/news/press-releases/arqiva-and-cityfibre-deliver-uks-largest-pilot-of-5g-ready-small-cell-infrastructure-/

[61] WIG has deployed their own fibre in Aberdeen and are planning a larger deployment in the West Midlands between Coventry and Birmingham. O2 will be anchor for both. https://www.ispreview.co.uk/index.php/2018/11/o2-uk-preps-europes-largest-fibre-connected-small-cell-network.html

[62] [✂]

operators who can package and re-sell the requisite connectivity (and often IT) inputs.[63]

3.21 BT and Openreach expects both internet access and site connectivity to be increasingly challenged by FTTP. Indeed, Openreach's fibre cities business case assumes [✂].

3.22 In summary, the bandwidth segment at 1Gbit/s and below is increasingly commoditised with vigorous competition at the retail level pushing down margins; and increasingly competitive wholesale supply including by FTTP altnets who are expanding their presence including in second tier cities.[64]

3.23 The evidence provided above, and in the Openreach submission, indicate that the market at 1Gbit/s and below on the one hand, and above 1Gbit/s on the other, have distinct characteristics both on the demand and supply side. Separate product markets should be defined to allow more appropriate targeting of SMP findings and any associated regulation to avoid regulating where this is unnecessary and may damage the competitive process (as discussed further below).

<u>Geographic boundaries are likely to differ between bandwidths at 1Gbit/s and below and above 1Gbit/s</u>

3.24 The geographic markets associated with these product markets are also likely to be distinct, reflecting how distinct demand characteristics drive different build incentives. In simple terms, network rivals will tend to dig further – extending geographic boundaries – to reach higher value customers.[65]

3.25 Ofcom recognises the differences in build incentives driven by customer value but does not reflect this in its analysis of geographic markets. It notes that the maximum economic dig distance for VHB services is significantly longer than for lower bandwidth services giving the example of a 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. Ofcom note therefore that *'a supplier of a VHB service would not necessarily be willing to dig to provide lower bandwidths, as it may not find it economic to do so'*.[66] We

[63] There are many retail competitors who are well versed in buying and packaging connectivity and IT inputs from a variety of providers, nationally and internationally. This includes software specialists, system integrators and many other resellers in addition to telecom operators such as TalkTalk, BT Enterprise, Virgin Media or Colt and a large number of small local resellers serving SMEs. Most retail providers of business connectivity bundle other services with connectivity – including cloud services, managed email, voice, cyber security, IT and other services. The connectivity input can be supplied by Openreach, Virgin Media or other wholesale providers using mix and match approaches (e.g. combining some or all of self-build, Openreach active services, and wholesale inputs from altnets).

[64] Increased competition from FTTP providers such as CityFibre, Hyperoptic, Gigaclear and others in capital and second tier cities (often supported by local councils as anchor tenants) is acknowledged by Ofcom (for example at paragraphs 3.24, 4.73, 6.22, 6.72, 7.49 and Annex 14 (as well as in section 9 in relation to Hull). We use the term 'second tier' cities as the non-capital cities of the UK. See also:
https://people.uta.fi/~atmaso/verkkokirjasto/Second_tier_cities_policy.pdf

[65] The interactions between geographic and product market definition were noted by the Competition Appeal Tribunal as follows: *'if [the CAT] … set aside its product market definition, [Ofcom] … would also have to revisit its decision on geographic markets. In particular, we would envisage that if, as a result of its reconsideration, Ofcom were to define the product market(s) differently, it would likely have to adjust the main criteria that drive the design of its infrastructure presence.'* CAT Judgment in BT's appeal against Ofcom's 2016 BCMR, paragraphs 157, 336 and 400.

[66] Ofcom note that these indicative results may be distorted as a result of Openreach pricing (given Openreach is a monopolist and VHB prices have been deregulated), which Ofcom claim are likely to be inconsistent with prices that would prevail in a competitive market. Yet, as noted further below, prices in the VHB segment have been falling as a result of increased competition. It seems unreasonable for Ofcom to justify its SMP finding based on a hypothetical counterfactual of VHB

agree with this assessment and consider that it points strongly to distinct competition conditions.

Ofcom does not present sufficient evidence to show that Openreach has SMP even without DPA

3.26 Even on Ofcom's own analysis (which finds the impact of DPA to be immaterial in the time-frame of the review), there is more competition than Ofcom suggests, and therefore less need for regulation at all or, where it is needed, more scope for it to be targeted to the specific issues identified). The latter is set out in greater detail in section 4 below.

There are more effectively competitive HNR Metro areas (across all bandwidths) than just the Central London Area

3.27 The percentage of large businesses and mobile sites within 50m of two or more rival infrastructure providers is 89% across the combined Metro areas, compared to 90% for the Central London Area,[67] indicating a comparable level of rival network presence.[68] By Ofcom's own measure, therefore, the vast majority of customers in these areas already have access to competitive business connectivity services across all bandwidths.

There is a strong case for finding additional areas to be effectively competitive in the VHB market

3.28 First, as noted above, the VHB market is a high value market in which tendering and long-term contracts are commonplace. Even absent duct and pole access, rival providers find it economic to dig much further to connect a VHB customer than a lower bandwidth customer; the 10G radial dig distance is around double that of a 1Gbit/s circuit (assuming either a 3-year payback and a 5-year payback period).[69]

3.29 Second, prices have continued to drop in this segment by 30%-40%.[70] That there remains a margin between prices and costs in this segment is not inconsistent with a competitive market: a bandwidth gradient is commonly used (by Openreach and rivals) to recover fixed and common costs efficiently (i.e. in a way which maximises output and consumer welfare).[71]

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margins in a presumed competitive market, without any evidence on pricing in competitive parts of the market and contrary to economic theory which suggests that where large common costs are present, price cost mark-ups will tend to vary depending on willingness to pay including in competitive markets.

[67] BCMR 2018 Consultation, Table A12.12.

[68] The Temporary Conditions Statement Ofcom 2017 did not propose regulation in Birmingham, Glasgow and Leeds – see Ofcom, Business Connectivity Markets, Temporary SMP Conditions in relation to business connectivity services, 23 November, 2017.

[69] BCMR 2018 Consultation, para Table A10.6.

[70] BCMR 2018 Consultation, para A14.45.

[71] Where there are there are economies of scope between different bandwidths a competitive differentiated product market would tend to deliver a mark-up over fixed and common cost that differs materially depending on the value of a service to the user. Ofcom recognises this also in the context of charge-controlled products where it notes that '*the bandwidth gradient can also reflect efficient common cost recovery where products with a higher willingness to pay make greater contributions to common costs, allowing fewer common costs to be recovered from lower bandwidth products*.' (BCMR 2018 Consultation, Annex 10, footnote 28). Last but not least where a market is competitive and there is innovation, prices will be higher initially

3.30 Third, Openreach's market share (based on the installed base of circuits) falls under the threshold where dominance concerns typically arise[72] in the BT+1 and HNR areas (it is between 31% and 40% according to Ofcom).[73] We doubt that market shares based on new connections (which are higher) are reliable.[74]

3.31 Put simply, Ofcom has not made the case that Openreach has SMP in the HNR Metro areas nor in additional areas for the VHB segment (which the evidence indicates should be assessed separately from the lower bandwidth segment, and indeed constitutes a separate market). Regulating where effective competition exists now or is likely to emerge in the next two years, may interfere with the dynamics of infrastructure competition which Ofcom expects to deliver benefits for customers (as discussed further in section 4).

Ofcom has not properly assessed the potential competitive impact of DPA during the review period

3.32 Ofcom compounds the under-statement of competition described above by giving no weight to the impact of DPA in its market definition analysis, and only a very limited consideration in its assessment of market power. This is an error because DPA will materially increase CPs' ability and incentive to deploy fibre, and this will materially increase the competitive constraints on Openreach. This is even more so in the VHB segment given the removal of the usage restriction which will allow high value business customers to be targeted (and with strong incentives for CPs to move quickly) without the need to show an intent to deploy consumer broadband.

3.33 Ofcom has proposed to remove the remaining usage restrictions on Openreach's duct and pole access product in the PIMR. But the DPA remedy is by no means new (dating back to 2011 but initially rarely used). The 2018 WLA Statement introduced measures to make the DPA remedy more attractive for rivals by lowering the rental; spreading network adjustment costs across active prices, and relaxing – but not removing - usage restrictions. All except the latter two of these changes have been effective since May 2018.[75]

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as only customers who value the product highly purchase it; later on, as the market matures, and a greater number of customers adopts the product, the additional demand will incentivise entry, and prices will tend to become more aligned with cost.

[72] The EC SMP Guidelines note that '*the European Commission's experience is that market shares less than 40% means that dominance is not likely*'. BCMR 2018 Consultation, paragraph 6.14 and footnote 116.

[73] In BT+1 and in HNR Metro Areas it finds that Openreach's largest rival has a market share of 41%-50%; and a share of 21%-30% in Other HNR areas (see BCMR 2018 Consultation Table A14.3).

[74] The market share analysis in the VHB market appears to rely on data that is not comparable between providers (see Openreach's separate submission to the BCMR) and appears to indicate a share of new 2017 connections 51%-60% of Openreach in the VHB segment in BT+1 and HNR Metro Areas and 61%-70% in other HNR Areas. This does not reflect the experience of BT of the competitiveness of this market segment. It is also inconsistent with the VHB market share data published by Ofcom in the 2017 Temporary Conditions. We therefore urge Ofcom to recognise the importance of data validity in conducting its analysis.

[75] Currently Openreach have published a draft reference offer which is intended to become effective at the start of April 2019 (https://www.openreach.co.uk/orpg/home/products/ductandpoleaccess/ductandpoleaccess/downloads/PIAProductDescriptionAug18_Draft_v5_6_Clean.pdf) which intends to fully implement the changes required in the 2018 WLA Statement. In

3.34 In April 2019, concurrently with the expected BCMR 2019 Statement, the changes introduced in the WLA Statement will be completed (as Openreach will no longer charge access seekers for duct repairs that may be required when they use DPA). Shortly after, in Spring 2019, Ofcom proposes that UDPA should come into force, extending the permitted use of DPA to provide services solely to business-only providers.

3.35 Based on the active engagement of CPs in DPA implementation working groups run by Openreach and Ofcom we expect a high degree of interest and readiness.[76] In fact, [✂].[77]

3.36 Using DPA, CPs – including, if all usage restrictions are removed, future leased line-only providers – can deploy networks without investing in their own physical infrastructure. This will allow (in many cases) faster roll-out at lower cost and less risk than self-build.

3.37 More specifically, should Ofcom remove the remaining usage restrictions on DPA (as it proposes to), two models of network competition will be facilitated, namely:

- Tactical network build: targeting of high value sites (or contracts) by niche providers.[78] For example, business specialists such as SSE, Zayo, Exponential E or Colt will be able to connect high value sites (including data centres, MNO backhaul, and large corporate sites) at a lower cost quickly, and as demand arises; and
- Strategic network build: scale build of FTTP covering both residential and business sites (including sites of very high bandwidth demand). Strategic builders (for example CityFibre) will aim to cover clusters of public sector entities or businesses at 1Gbit/s and below or entire postcode areas with FTTP.

3.38 The strategic and tactical models of competition are mutually reinforcing. There is likely to be a race to win tenders for high value sites not least to secure these customers quickly through long term contracts. In addition, these could act as a catalyst for strategic FTTP build for residential and smaller business premises by de-risking it.

3.39 The high value of VHB circuits means that it is likely to be worth deploying DPA instead of actives even for a small number of individual sites.[79] In the chart below, the total cost of ownership (TCO) where DPA is used is more economic than buying actives for less than a single customer (where costs are spread a five-year period).

addition, in the 2018 PIMR consultation Ofcom proposes that Openreach should have a new reference offer for unrestricted DPA in place one month after the PIMR Statement.

[76] CPs have been meeting regularly, together with representatives of the Office of the Telecoms Adjudicator (OTA) and Ofcom, to identify and resolve process and systems challenges to facilitate third party use of Openreach ducts and poles.

[77] The registration process is referred to as 'establishment process'. For CPs to become established they need to demonstrate capability of using DPA safely (in the same way Openreach does itself) to ensure the integrity of the network, the safety of its employees and third parties (as DPA involves construction work in public spaces). [✂]

[78] Ofcom also anticipates selective competition for leased lines in the short term. It states '*…we plan to introduce proposals that seek to provide unrestricted access to Openreach's ducts and poles nationwide. An unrestricted remedy would provide greater flexibility, better reflecting the needs of operators investing in full-fibre networks to provide a range of services; for example, initially leased lines to businesses, and later broadband to homes*.'
https://www.ofcom.org.uk/__data/assets/pdf_file/0025/116539/investment-full-fibre-broadband.pdf, paragraph 1.16

[79] The chart assumes that a CP does not already have presence in the area where it considers deploying enterprise connectivity; however, most strategic builders or their CPs customers will already have such presence, by virtue of having built up this presence as a result of prior investments in LLU.

Figure 2: TCO per mobile site using DPA vs Wholesale Mobile Connect (WMC)

[✂]

3.40 For lower value sites, DPA is likely to cost in for clusters of customers.

Figure 3: TCO per site using DPA vs Wholesale Ethernet at 1Gbit/s

[✂]

3.41 Ofcom under-estimates the likelihood of take-up within the next two years by focusing only on strategic build. It notes that *'the main network expansion plans that may affect the CI market by 2023 are by* [Ofcom redacted] *and Cityfibre*'.[80] It is not clear, therefore, whether Ofcom has assessed the scope for rapid DPA take-up to support tactical build by CPs (large and small) in many different locations in or close to metropolitan areas and particularly focused on the VHB segment.[81] This could be a stand-alone strategy or as part of a subsequent strategic build.

3.42 AlixPartners, in their expert report provided in the Annex, also conclude that Ofcom has not properly assessed the potential competitive impact of DPA in the review period. The report agrees with the evidence set out above that DPA will significantly increase CP's ability, incentive and the speed of deploying their own fibre.

3.43 Further, the AlixPartners Report finds that this is likely to materially increase the competitive constraints on Openreach across most areas defined by Ofcom, allowing CPs to economically address demand 10 times further away from their existing networks than when they need to build their own physical infrastructure. This makes CPs own fibre connections to end users cheaper than even the cheapest Openreach wholesale Ethernet service (100Mbit/s EAD LA) for distances up to just under 300m. For higher bandwidth services, particularly over longer contract terms, DPA allows cheaper deployment for even greater distances (i.e. up to c.1.6km using a seven-year payback period).

3.44 AlixPartners also find that taking the likely impact of DPA into account would materially increase the size of the areas considered by Ofcom to be HNR. While Ofcom does not disclose the information on CP network location used to determine geographic markets, the sensitivity analysis undertaken by Ofcom shows that, by increasing the buffer distance from 50m to 100m, the number of postcode sectors classified as HNR more than doubles from 576 to 1,261. Furthermore, the number of postcode sectors categorised as 'BT Only' falls by over 20%. If the VHB segment was correctly considered a separate market, the impact of UDPA would be even more pronounced; and particularly so if Ofcom were to conduct the analysis on an exchange by exchange basis (as it should).

3.45 Ofcom's SMP assessment in the BCMR for both the access segment and in interexchange backhaul, is predicated on Openreach's control of physical

[80] BCMR 2018 Consultation, para 6.72.

[81] BCMR 2018 Consultation, para 6.74. Ofcom also note - without any additional explanation or evidence - that *'*[i]*n 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.'*

infrastructure. For example, Ofcom states: '*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*.'[82] DPA allows BT's downstream rivals equivalent access to its duct network. Therefore, any competitive advantages that BT may be argued to have in the past derived from its duct and pole network will soon be available to all CPs with no restriction on how they choose to use that access, and on equivalent terms (including cost) to Openreach.

3.46 In fact, the availability of DPA will affect competitive constraints even if some CPs do not actually intend to use DPA. Just the availability of, and the knowledge that it can effectively reduce deployment costs, is likely to affect Openreach's incentives when setting the terms and conditions for its Ethernet services and BT Enterprise for its retail business connectivity products.

3.47 These game-changing impacts also cast (additional) doubt on the interpretation of historic market shares as an indicator of market power. If Openreach's SMP reflects its advantages resulting from its control of physical infrastructure, then DPA will remove the ability to gain competitive advantage from this control. In this context, historic shares are an even less reliable indicator of Openreach's future market power than they have been in past market reviews. (We noted the concerns raised by Openreach about Ofcom's reliance on (likely biased) shares based on new connections in 2017).

3.48 These considerations imply that Ofcom should undertake its SMP analysis again, taking DPA into account and using more appropriate indicators of market power. The evidence in the report by AlixPartners indicates that – following such a reassessment – Ofcom would find SMP in fewer areas and (at least) find the HNR Metro areas to be effectively competitive (in addition to the CLA). We also doubt that Ofcom would find market power in additional areas were it to appropriately define VHB as a separate market. Indeed, we consider these areas to be effectively competitive even before a consideration of the impact of DPA.

3.49 Without capturing the distinct dynamics of the VHB market (as also required by the CAT)[83], and the game changing effects of DPA, Ofcom's market power findings are not robust. Nor are its proposed remedies which are not required in areas which are effectively competitive, or if required could be lighter, where competition is likely to emerge in the next two years. Similarly, taking into account DPA (and assessing exchanges one by one rather than using an average distance approach in its assessment of geographic markets) would likely reduce the number of BT exchanges where Ofcom deems competition to be unviable.

3.50 The lack of proper consideration of the impact of DPA in a forward-looking assessment of markets is a major error. Imposing regulation where it is not required could interfere with the dynamics of infrastructure competition, as discussed further in section 4.

[82] BCMR 2018 Consultation, para 6.23.

[83] See Openreach response and Competition Appeal Tribunal Judgement in BT vs Ofcom, 1260/3/3/16, 10 November 2017.

4 Openreach and BT need to have commercial flexibility to compete fairly where there is competitive pressure

4.1 Ofcom expects competing full-fibre networks to emerge and describes its regulatory strategy as supporting this development while providing protection to customers where that investment is unlikely. It therefore seeks to target regulation upstream on passive network infrastructure; remove regulation where competitive conditions allow; and protect consumers by regulating where necessary.[84]

4.2 The PIMR and BCMR are Ofcom's first market reviews after this strategy was spelt out in Ofcom's July 2018 Strategic Policy Position. In many respects, Ofcom's remedy package shows a high degree of consistency with its policy objectives.

4.3 But in several important respects regulation in the BCMR can be more appropriately tailored to reflect actual and imminent network competition supported by UDPA which will quickly ramp up competitive pressure (especially in high value business segments).

4.4 We understand a degree of caution on the part of Ofcom given uncertainties about market developments. But competitive outcomes are likely to precede network presence due to the procurement processes and exercise of buyer power as described above. And more emphasis can be placed on competition law and the Commitments as safeguards for customers during the transition to greater competition. Indeed, competition law should – where competition is likely to emerge in the time-frame of the market review – provide sufficient protection to address any concerns relating to selective discounts or margin squeeze. The Commitments provide additional assurance by holding Openreach to account in treating all its downstream customers equally.[85]

4.5 On this basis, we don't think that continued de-regulation of (at least) the HNR Metro areas (across all bandwidths) and additional areas for the VHB segment poses material risks for customers. In fact, there are benefits to customers of allowing competition to play out: unnecessary regulation would reduce the scope for fibre investment at efficient cost (and lower prices for consumers).[86]

4.6 More generally, we want to ensure that Openreach can compete fairly as competition ramps up; not least because this is crucial to the competitive success of our downstream businesses which rely on Openreach inputs to be competitive; and ultimately to the competitive dynamic which delivers benefits to final consumers.

4.7 The areas and segments that will attract network competitors in the short term are easier to predict (because many of them are already very competitive) than the

[84] BCMR 2018 Consultation, para 10.6.

[85] In fact, equal treatment of a monopolist's downstream customers (including its own downstream arm) is only a relevant concern where there is no realistic threat of entry by an infrastructure competitor

[86] While Ofcom has regulated cautiously so as to foster infrastructure competition by imposing a safeguard cap (or a Fair and Reasonable requirement in BT+2 areas in the business access market), preventing Openreach from responding fairly to competition will tilt the playing field towards entrants who may be less efficient than Openreach, particularly so in the VHB segment (which is also the most competitive and innovative part of the market). Inefficient entry will tend to raise prices (in turn reducing take-up of the new services and reducing the scope for investment).

boundary between possibly competitive and uncompetitive areas. As we set out in greater detail in section 5 below, Ofcom should not pre-judge the latter by mandating dark fibre now for certain inter-exchange connectivity routes which are deemed to be uncompetitive.[87]

4.8 More generally, we expect our downstream businesses to have the same commercial flexibility as rival CPs in respect of their network supply options. Our downstream businesses will use DPA (and dark fibre if mandated) to deploy networks as necessary to maintain competitiveness.

4.9 We also note that the emergence of network competition is a dynamic process which evolves over time. The Commitments must, in turn, be seen as a dynamic arrangement that will need to evolve to reflect these market changes. To the extent there is effective infrastructure competition already, the economic and legal underpinning for the Commitments falls away.

Ofcom's remedy proposals align with its strategy in several important respects

4.10 Ofcom's PIMR and BCMR proposed interventions are shaped by the policy position it set out in July 2018. In particular:

- **Targeting regulation on upstream to passive network regulation**. The PIMR gives effect to this objective and signals a greater focus for regulation on the part of the value chain that is costly to duplicate by rivals in order to make competitive investment more attractive. We see what Ofcom is trying to achieve, and have offered to facilitate duct and pole access, but regulation must still not over-reach: UDPA as proposed by Ofcom is a step too far in effectively competitive business markets (for the reasons set out in Section 2). It is also hard to justify moving beyond the existing duct and pole remedy now as Ofcom has yet to complete its holistic review of business and residential markets and has not, therefore, picked up some important recent market developments (including, but not limited to, the Openreach fibre deal) which have implications for both the assessment of competition and the design of remedies. Should Ofcom nevertheless decide to impose UDPA including in geographies and areas that are competitive in BCMR markets, then Ofcom must assess its impact on competition looking forward, and adjust its remedies accordingly. As set out in section 3 above, Ofcom has not done so.
- **Geographic variation**: A regulatory model which is geographically differentiated is sensible and indeed not new to business connectivity markets. We agree with Ofcom moving towards an approach that will allow a more holistic assessment geographic regulation across business and residential markets in due course. However, we caution against over-simplification. The model adopted by Ofcom

[87] As set out in section 5, Ofcom should defer any dark fibre intervention to 2021 when there is a better prospect of these boundaries being revealed (with competition facilitated – where possible - by UDPA).

(across geographic and product[88] dimensions, which are related) still needs to reflect important variations in market power between geographic areas and customer segments. For the reasons set out in section 3, business markets have distinct characteristics across different segments of demand which drive different competitive conditions.[89] The unnecessary proposed regulation of HNR Metro areas and the VHB segment more widely (even absent DPA) is symptomatic of Ofcom's potentially over-simplified approach: it results in regulation being targeted where it is not necessary, which may inhibit legitimate commercial competitive strategies and may make investment less attractive due to regulatory risk.

- **Remedies should incentivise investment whilst ensuring consumers remain protected as effective competition emerges**. As competition emerges, it is entirely appropriate to prioritise (as Ofcom has) price and regulatory stability over the static benefits of keeping price tightly aligned to costs. This aligns with the explicit intent expressed by the UK Government in the Future Telecoms Infrastructure Review[90] and will support the investment incentives of all infrastructure providers (not just Openreach). We also note that competition (facilitated by UDPA) provides its own protections in respect of wholesale pricing as competitors (using DPA) undercut Openreach's active prices. This is a risk in the short term, as rivals target business customers in HNR Metro areas and the VHB segment, and in the medium term, from multi-service build by operators such as CityFibre.

4.11 Put simply, we see a lot of consistency between Ofcom's strategic vision and its remedies package. There are, however, a number of issues where we think that Ofcom's strategic aims would be better delivered through a different approach. Specifically, an approach that:

- better reflects actual and imminent network competition (facilitated by UDPA) and the greater scope for commercial flexibility and de-regulation that this allows; and
- gives appropriate consideration to the constraints on BT's conduct arising from the Commitments (and general competition law) when assessing the need for additional SMP regulation; and, in turn, for the Commitments to evolve in line with changes in market conditions.

Ofcom's remedies package (for the BCMR) should be better tailored to reflect actual and imminent network competition

4.12 We set out in section 3 why there is effective competition (or a reasonable prospect of it emerging in the review period) in the HNR Metro areas (across all bandwidths) and

[88] We continue to consider that identifying a business connectivity product market across all bandwidths does not allow Ofcom to accurately assess market power and hence target remedies appropriately.
[89] In addition, the VHB segment (which should be defined as a separate market) has characteristics requiring contracts tailored to the needs of different customers and customer segments.
[90] The Future Telecoms Infrastructure Review, page 74 '*The Government's view is that promoting investment should be prioritised over interventions to further reduce retail prices in the near term, recognising these longer-term benefits*.'

for wider areas in the VHB segment. In a nutshell, this is because:

- There is a lot more existing network competition (from high network presence) in these areas and segments already, even without UDPA, as well as evidence of competitive constraints (such as declining prices);
- UDPA will (quickly) drive further competitive pressure by providing extra flexibility and more opportunities for network rivals to make a return on their investments. Indeed, we think that mixed usage DPA will also have a significant impact by allowing businesses to be targeted on the way to a scale build.

4.13 In short, at least in the HNR Metro areas (across all bandwidths) and for additional areas in the VHB segment – where DPA-driven competition will be particularly acute – there should be no SMP finding and no regulation downstream of physical infrastructure. This would follow the position taken by Ofcom when it last undertook a market analysis for the purposes of its Temporary Statement in November 2017.[91]

4.14 In the remaining (narrower) areas where Ofcom continues to find SMP, but where competition is expected to increase (encouraged by UDPA), Openreach must be able to respond to competition by rebalancing its pricing to (fairly) reflect competitive constraints as well as costs. It must also be able to tailor its offering (in particular in the VHB segment) to different customer segments and their needs. It should be able, for instance, to offer commercial term/volume/geographic discounts (consistently with competition law and the Commitments which offer safeguards against unequal treatment and undue discrimination).

4.15 In these areas (and segments) Openreach must have the commercial flexibility to meet the needs of all its customers and allow it to compete on a level playing field with network rivals. Allowing Openreach the flexibility to respond to pressure from infrastructure rivals is critical to the (market-driven) dynamic which ultimately delivers benefits to its customers. As set out in section 3 above, and in the AlixPartners report, availability of DPA on unrestricted terms is expected to have significantly increase levels of competitive pressure on Openreach, particularly for VHB services and in areas with high business presence where there is already alternative network build (e.g. HNR/Metro areas).

4.16 Given this and the strong direction of travel towards effective competition across markets, if Ofcom decides not to de-regulate, it should reconsider the need for an Equivalence of Inputs ('EOI') obligation because: (i) in these areas and market segments Openreach does not have the incentive to favour its downstream arm (as this would make it less competitive vis-à-vis rivals); (ii) the Commitments already require Openreach to treat all its downstream customers equally (see also below); and (iii) the obligation could be interpreted so as to prevent Openreach from meeting the needs of specific customers or customer segments.

4.17 If there were specific concerns that Openreach could engage in a price squeeze or otherwise act to the disadvantage of network rivals, in areas and market segments

[91] It is also consistent with the principle that a regulator should be looking to reduce rather than increase regulation in a market where competition is increasing, as envisaged by the Communications Framework. See also Communications Act section 6(1)(b); FD Article 16(3).

where Ofcom continues to find SMP, obligations including the fair and reasonable requirement and the no undue discrimination obligation already prevent Openreach from doing so, and general competition law also prohibits such behaviour.

4.18 We therefore request that Ofcom remove the EOI obligation in areas and market segments where competition is expected; or that, where it identifies specific risks to its objectives, the legal instrument on EOI is more tightly limited to the provision of services to downstream divisions. Ofcom should also clarify how it would assess EOI and no undue discrimination in the context of bids (should it decide to retain EOI).

4.19 It is in this context we also ask Ofcom to clarify the policy intention of the obligation to provide access on fair and reasonable terms. Ofcom itself notes that the policy concern in the areas where it proposes a fair and reasonable obligation that Openreach could impose a 'margin (price) squeeze or to otherwise act anti-competitively in setting prices'.[92] We are concerned that a broader interpretation could be applied in practice and this may again serve as a barrier to commercial flexibility.

4.20 Regarding geographic differentiation in price, Ofcom accepts that DPA will increase competition with a likely focus on higher speeds,[93] but still proposes to regulate services above 1 Gbit/s with a safeguard cap to address a concern 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*.'[94]

4.21 This is a change of policy as Ofcom has previously accepted that such de-averaging (to reflect different costs and 'local characteristics of competition' may be a natural and legitimate consequence of competitive pressure in business markets. In the BCMR 2016 Statement, Ofcom stated:

> '*We note that for the geographic markets where we have found SMP, the underlying costs and competitive conditions will not be completely homogenous throughout the UK. This suggests that some freedom to charge in a way that reflects more accurately the costs incurred and to respond to the local characteristics of competition that exist in these markets could be efficient. Moreover, given the level of cost differences that may exist and the extent of competition in some areas, BT's ability to compete could be limited if it were required to maintain nationally uniform prices. Hence, geographically differentiated prices may reflect BT responding legitimately to cost differences in the face of competition*.' [95]

4.22 This policy change is surprising and inappropriate. Ofcom's fixed access regulatory model is becoming firmly differentiated by geography, reflecting where rival networks will emerge, and where this is less likely. A degree of wholesale price de-averaging is consistent with this as existing geographic cross-subsidies in Openreach's pricing are eroded by rivals targeting low cost, high value geographies. If Openreach or alt nets are to find it viable to roll out fibre in high cost, lower value geographies, Openreach must be able to raise prices correspondingly in these areas as competition forces it to lower

[92] BCMR 2018 Consultation, para 1.19.
[93] BCMR 2018, para 1.22. Ofcom accepts that duct and pole access will lead to an increase in competition '*which is likely to focus on higher speeds*'.
[94] BCMR 2018 Consultation, para 1.22.
[95] BCMR 2016 Statement, para 8.93.

prices elsewhere.

4.23 The extent of any such geographical pricing differences is unknown at present, as it would depend on the nature and location of competition and the erosion of cross subsidy. Were Ofcom to regard such legitimate wholesale price variation as unacceptable from a social perspective, we would expect it to confront the consequences of promoting greater infrastructure competition by offering appropriate policy solutions (for example industry levies). The answer cannot be to compromise the ability of Openreach to legitimately meet competition (and rebalance elsewhere to ensure the recovery of common costs). At a minimum, Openreach should have flexibility to respond legitimately to cost differences in the face of competition. This is important to BT Group because its downstream business units depend on being competitively supplied by Openreach.

Ofcom should give greater weight to the Commitments in designing remedies and ensure that they evolve with market developments

4.24 When considering the extent to which there is a competition problem and the proportionality of any remedy, Ofcom should give greater weight to the Commitments (as indicated in the July 2017 Statement[96] and the Access Directive[97]). It should give more weight to competition law which provides a safeguard against abuse of dominance (e.g. through pricing), unequal treatment and undue discrimination.

4.25 Specifically, in assessing suitable safeguards to protect customers during a foreseeable transition (in some areas) to effective competition, Ofcom should have given greater weight to the protections these offer, before considering whether to layer on SMP regulation. In particular:

- The Commitments (in Ofcom's words) constitute '*[t]he biggest reform of Openreach in its history*' and (although voluntary) they go a long way to removing the incentive and ability of BT to discriminate in favour of its downstream arm;[98] and
- Ex post competition law is sufficient to protect against predatory pricing behaviour or margin squeeze (and excessive pricing) where there is no specific concern.[99]

[96] Delivering a more independent Openreach: Statement on releasing the BT Undertakings pursuant to section 154 Enterprise Act 2002. 13 July 2017. See for example, paragraph 7.12 which states: '*In this context, we consider the most appropriate and proportionate approach is to consider the effect, if any, of the new arrangements in BT's Notification on SMP regulation as part of those ongoing reviews.*'

[97] The Access Directive (Article 13) and Communications Act (section 89C) make it clear that functional separation can have an effect on the existing regulatory obligations and that this should be explicitly assessed. Further, this should not be interpreted as a one-off obligation but rather, given the forward-looking and dynamic nature of the market review process and resulting regulation, it is an ongoing requirement on Ofcom.

[98] As part of the Commitments, the principle of equal treatment is enshrined in Openreach Limited's Articles of Association. Ofcom has put in place several mechanisms to ensure compliance, including the establishment of the Openreach Monitoring Unit 'OMU'. BT and Openreach also have their own compliance functions to specifically monitor compliance with the Commitments, both in letter and in spirit. Whilst the Commitments are voluntary in nature, there would be serious consequences for BT were it to renege on them.

[99] BT's and Openreach's internal governance process includes compliance with the competition law rules in relation to pricing. Indeed, competition law assessment of pricing practices has been well-developed through case law over a long

4.26 In turn, more infrastructure competition (driven by unrestricted DPA) has implications for how the Commitments evolve over time. They stand as a remedy to a competition concern – namely discrimination – and, like functional separation, are intended for circumstances where '*there is little or no prospect of effective and sustainable infrastructure-based competition within a reasonable timeframe*.' [100]

4.27 Should Ofcom be concerned about the voluntary nature of the Commitments, we have included in the Commitments a notice period. In addition, Ofcom also stated that it has the ability to step in if BT were to seek to walk away from the Commitments.[101]

4.28 Last but not least, to the extent there is effective infrastructure competition already, the economic and legal underpinning for the Commitments falls away. As this is a dynamic process which evolves over time, the Commitments must, in turn, be seen as a dynamic arrangement which evolves over time.[102]

BTs downstream business units should have the same commercial flexibility as rival CPs

4.29 In a more competitive environment, we also expect our downstream businesses (i.e. BT Consumer and BT Enterprise) to have the same commercial flexibility as rival CPs in respect of their network supply options. Our downstream businesses will use DPA to deploy networks as necessary to maintain competitiveness.

4.30 In line with the Commitments, they are permitted to make such deployments provided they do not 'materially substitute' Openreach products supplied in markets in which Ofcom has found SMP.[103] In these circumstances, we also expect Ofcom to exempt network deployments by BTs downstream business units from SMP regulation (when using own build or Openreach's duct and pole access). This is consistent with positions that Ofcom has publicly taken previously.[104]

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period of time, it is driven by principle and designed to strike the right balance between protecting the process of competition and individual competitors for the ultimate benefit of consumers. The European Commission Telecommunications Regulatory Framework provides for circumstances where competition law will be sufficient, even in cases of market power. The third criterion of the Three Criteria test is that remedies would only be applied where competition law would be insufficient.

[100] The legal provisions are set out in in ss. 89A and 89B CA03 which reflect the requirements of Article 13a AD.

[101] For example, see paras 3.28 and 5.11-5.18 of the final DCR statement:
https://www.ofcom.org.uk/__data/assets/pdf_file/0020/104474/delivering-independent-openreach.pdf

[102] The Commitments already reflect the need for change where SMP is no longer found by Ofcom, Paragraph 3.6 states '*In the event that Ofcom concludes, pursuant to a market review, that BT no longer has SMP in a particular market, then except in the event that BT determines at its sole discretion that it is impractical to do so, such products within that market (which were formerly SMP Products but which have become non-SMP Products) shall be provided by, and the related assets shall be managed by a division of BT other than the Openreach Division. BT plc shall notify Ofcom of its reasons in circumstances where it has decided to retain provision of such non-SMP Products within the Openreach Division*.'

[103] BT and Openreach Commitments, paragraph 9.8 (b);
https://www.btplc.com/Thegroup/Ourcompany/Theboard/Boardcommittees/BTComplianceCommittee/Publications/Commitments.pdf

[104] Ofcom has previously acknowledged that where BT Downstream uses an upstream passive input (i.e. dark fibre), BT downstream businesses should have the flexibility compete on a level playing field with other Openreach CP customers. In particular, in Ofcom's 9 July 2015 clarifications and corrections document to the 2016 BCMR it stated: *'we do not propose to impose SMP conditions ex ante on products which BT divisions, downstream of Openreach, might provide by using the dark fibre products which Openreach would provide in complying with our proposed Dark Fibre Access remedy, as long as BT fulfils*

4.31 [✂].

4.32 Based on the above Ofcom should explicitly set out in the final BCMR and PIMR Statement, that SMP conditions would not attach to products (or assets created) which BT downstream might provide using DPA (or mandated dark fibre), or to BT downstream self-build. This is on the basis that those products (or assets created) would not substitute to a material degree for Openreach SMP products (i.e. the same threshold for exemption that applies in the Commitments). Applying SMP obligations would not be necessary or proportionate where Openreach already has these obligations; and where the 'material substitution' provision ensures that these remain effective.

*otherwise the SMP conditions we propose in relation to active services. If Openreach were to fulfil all BT's obligations in relation to active services, and BT's downstream divisions were to provide additional active services by consuming regulated dark fibre from Openreach, we consider that our proposal to require BT to provide dark fibre on the basis of Equivalence of Inputs (EOI) should give sufficient assurance that CPs could compete in the provision of these downstream active services on a level playing field.'*https://www.ofcom.org.uk/__data/assets/pdf_file/0019/57043/clarifications_and_corrections.pdf

5 Dark fibre is not justified over other remedies and may have unintended consequences that are not in customers interests

5.1 Ofcom accepts the risk that dark fibre poses for incentives to invest and, more generally, the risk that the provision of backhaul and core connectivity services could be undermined.[105] It believes, however, that this risk is low because the scope of the remedy is limited to exchanges where '*network-based competition is least likely*'.[106] Given that Ofcom (and the Government) want to see more network-based competition, Ofcom cannot afford to get this wrong.

5.2 We think that there is a high risk of error (with adverse consequences for competitive network investment) because of the way Ofcom has specified the remedy (which creates a significant risk of mis-use), and because of the broad-brush way Ofcom has identified uncompetitive routes, without proper regard to the impact of UDPA. A better (and more proportionate) approach would be to combine UDPA and active remedies allowing the former to reveal more accurately the viable scope of competition, whilst the latter would protect customers where competition is not viable during the two-year transition. At the very least, Ofcom must address the specification problem.

5.3 Even then, the case for mandating dark fibre has not been made by Ofcom. As the industry moves to a full-fibre future and to new Openreach products, smaller exchanges will be by-passed, and we plan to rationalise the exchange estate to deliver efficiencies as this occurs. In the context of these industry changes, take-up of dark fibre can be expected to be low and short-lived (bringing into question proportionality given significant risks). But if we are wrong and there is take-up, our rationalisation plans may be delayed as well as the realisation of efficiencies that we would otherwise pass through to customers. More generally, the evidence does not support Ofcom's claim that customers will benefit from increased flexibility and control compared to Openreach's active products.

5.4 We also have concerns about the proposed dark fibre pricing which will limit the ability of Openreach to use a bandwidth gradient (for its active services) to efficiently recover its costs without justification; and which have been set at a level which omits certain valid costs.

5.5 Given Ofcom's stated intention of extending the dark fibre remedy in the future, Ofcom might be tempted to think that pushing for dark fibre now (without a strong case but to a limited extent) would establish the concept and makes its extension easier in due course. This is ill-founded. The remedy must be proportionate when first imposed and any subsequent extension must also be proportionate (against a counterfactual of no dark fibre remedy).

5.6 There can be no expectation on the part of Ofcom that it will be easier to demonstrate proportionality for an expanded dark fibre remedy further down the line simply because it has shifted the counterfactual by imposing dark fibre in the first instance on weak

[105] BCMR 2018 Consultation, para 12.35.
[106] BCMR 2018 Consultation, para 12.35.

grounds. Ofcom would need to have very solid grounds for extending dark fibre into the access segment given the risk it poses to investment incentives. Even in uncompetitive areas, investment may still be commercial, and regulation will need to be designed carefully to bring this forward.

There is a high risk that dark fibre (as specified) will deter competitive investment and unfairly distort existing infrastructure competition

5.7 Ofcom makes very clear that dark fibre could deter competitive investment by network rivals, and that this would be inconsistent with its strategy to promote network-based competition (facilitated by UDPA). It states, '*the more attractive it is to buy dark fibre, the less likely operators are to roll out their own network*.'[107] Ofcom also accepts that this may have the unintended consequence of entrenching market power in backhaul and core connectivity where some competition exists or is viable.[108]

5.8 To avoid these adverse effects on rival investment (and to give UDPA a chance), Ofcom claims to have taken a 'conservative' approach by proposing dark fibre only at routes from BT Only exchanges where it thinks that material rival investment is 'very unlikely'.[109] Ofcom considers it highly unlikely that rivals would find it economic to dig to these exchanges from their own networks because the dig distances are long and demand at these exchanges is relatively low. Ofcom considers that its duct remedy will make little difference '*except in a very small minority of case*s.' [110]

5.9 We don't agree that Ofcom has been 'conservative' nor that dark fibre is limited to areas where Ofcom can be 'confident' that network competition is unlikely to develop as a result of UDPA.[111] We think that there is a high risk of error (with adverse consequences for network investment) for the following reasons:

- First, the specification of the remedy has the unintended consequence that dark fibre could be used to create low cost core and backhaul infrastructure which undermines the existing (and prospective) investment in backhaul and core connectivity;
- Second, competitive build to exchanges which are currently BT Only (and therefore treated as uncompetitive) is likely to be viable in some cases; these should not be counted as BT Only as they are potentially competitive;
- Third, UDPA will make some of the BT Only exchange more attractive to contest by rivals by lowering their costs of network entry or expansion.

Without proper scoping there will be unintended adverse impacts on competition and investment

5.10 Although an error of omission rather than design, the lack of any limits on the dark fibre remedy would result in a significant adverse effect on investment in new networks as

[107] BCMR 2018 Consultation, para 12.76 and 12.77.
[108] BCMR 2018 Consultation, para 12.90 '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.'
[109] BCMR 2018 Consultation, para 12.78.
[110] BCMR 2018 Consultation, para 12.83.
[111] BCMR 2018 Consultation, para 10.15.

well as undermining existing investment undertaken by Openreach and others.

5.11 The remedy, as specified, can be 'daisy chained' between eligible exchanges (i.e. where there is a BT only exchange at one end) thereby replicating infrastructure in areas deemed to be more competitive (including those that have previously been designated as core infrastructure). Openreach estimates that the remedy would oblige it to provide dark fibre on over [✂] possible routes spanning the UK.

5.12 We do not think that dark fibre should be mandated anywhere at this juncture. But if Ofcom does go ahead, it must address this unintended gaming opportunity. We support Openreach's proposal that use of the remedy should be limited to the provision of backhaul from a non-competitive exchange to the nearest exchange at which competitive backhaul is available.

5.13 Specifically, Openreach proposes limiting the availability of dark fibre from each BT Only exchange to a specific NGA parent handover exchange. Although a handful are not categorised by Ofcom as competitive, such a move would create a strong incentive for competitive infrastructure to be created (and duct and pole access would reduce the cost of such a deployment significantly.)

Ofcom's broad-brush approach inappropriately designates some exchanges as BT Only (and therefore uncompetitive) when, in fact they are potentially competitive

5.14 Ofcom determines that each exchange is its own geographic market but then fails to assess, on an exchange by exchange basis, the scope for potential competition (as it has done in the access segment). Instead Ofcom concludes that there is SMP for cohorts of exchanges (e.g. 'BT Only') based on average distances (across the cohort) to the nearest rival infrastructure, and general comments about demand. This is not enough to be 'confident' that competition can be been ruled out, because it masks the particular characteristics of individual exchanges within the cohort.

5.15 Our analysis shows that at least [✂] BT Only exchanges are within [✂] of an alternative network suggesting that digging would be economically viable.[112] The Openreach submission also points to a potential error in the designation of BT Only exchanges based on its sale of Cable Link (suggesting PCO presence at these exchanges).

Ofcom has given insufficient weigh to the impact of UDPA

5.16 Rival connections to BT Only exchanges can only become more attractive with duct and pole access as it will significantly reduce the costs of doing so. Although Ofcom dismisses this, it offers no quantitative analysis of how reduced build costs might change the incentives to connect on an individual exchange basis.[113]

[112] Ofcom itself accepts that 5% of BT Only exchanges (c.216) are located in areas found to be BT+1 or BT+2 or more, as defined by its geographic market definition for access. For these exchanges, it can be concluded there is rival network nearby because Ofcom's own analysis of the access segment identifies that BT is not the only potential provider of leased lines.

[113] Ofcom says that it has considered the potential for investment in backhaul in different parts of the market where it proposes that BT has SMP (para 12.78). But this is not an exchange by exchange analysis. Rather Ofcom looks at aggregated segments (BT Only, BT+1 and BT+2 or more) and judges the attractiveness of investment using a qualitative assessment of

5.17 We agree with the conclusion of the AlixPartners report that Ofcom should have assessed the impact of UDPA on network deployment on a disaggregated basis. Ofcom are uniquely placed to do this analysis. To illustrate the potential impact, AlixPartners note that there will be considerable variation within the average distance to the nearest rival network of 6km.[114] It is possible, therefore, that a proportion can be economically connected over shorter distances and that UDPA would be make this more attractive by lowering connection costs.[115]

5.18 Ofcom is explicit that dark fibre will be considered where duct and pole access will not lead to effective competition. Ofcom cannot be confident of this until UDPA has been allowed to take root and reveal the areas where effective competition is likely and the areas where it will not. A better approach would be to make UDPA available and allow market-driven backhaul solutions to play out and reveal these distinctions. Intervening before this dynamic has played out will simply distort choices and embed a solution chosen by Ofcom rather than allowing for competitive entry in response to the needs of customers. Nor is this approach consistent with Ofcom's policy of targeting its regulation upstream.

5.19 In summary, we don't agree that Ofcom has identified, with sufficient confidence, routes or areas where material rival investment is very unlikely (taking appropriate account of UDPA). Nor has it done enough to avoid 'creep' of its dark fibre remedy into competitive segments (through the 'daisy chaining' of routes). Mandating dark fibre on routes which are actually or potentially competitive (either by design or through the omission of appropriate limitations) will distort competition and deter investment which is entirely contrary to Ofcom strategy to promote network-based competition and will not benefit customers.

It is unclear why reducing backhaul costs in non-competitive areas will deliver benefits to customers over and above existing remedies

5.20 Ofcom outlines two kinds of potential benefit from dark fibre, specifically: (i) more network competition, where lower backhaul costs will enable infrastructure build to end users (i.e. in the access segment);[116] and (ii) more access competition, where users of the Openreach network are better able to compete in retail markets on price service quality and product offerings.[117]

5.21 Standing back from these claims, certain industry trends (WLR withdrawal, PSTN closure, migration of CPs to new Openreach products and exchange rationalisation) suggest that take up of dark fibre may be modest. But if this is incorrect, and take up is significant, dark fibre could have the unintended consequence of retarding these pro-consumer developments.

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demand and supply. The critical supply analysis (of rival infrastructure within economic reach of the exchange) has not been undertaken (even though Ofcom has done this analysis in the access segment).

[114] BCMR 2018 Consultation, para 12.83.

[115] AlixPartners' amended version of Ofcom's economic dig distance model finds that it is more profitable for a CP to use UDPA rather than EAD LA 10 Gbit/s for circuits up to c.1.6km, assuming a 7-year economic life.

[116] BCMR 2018 Consultation, para 12.65. Ofcom states '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 areas'.

[117] BCMR 2018 Consultation, para 12.65.

5.22 The benefits claimed by Ofcom are largely asserted rather than supported by evidence. We doubt that these benefits exist or, if they do, that they are material for the reason set out below. Ofcom also underplays the benefits of OSA Filter Connect significantly which in most important respects matches the dark fibre benefits claimed by Ofcom.

Certain industry trends indicate that dark fibre take-up is likely to be modest

5.23 As the industry moves to a full-fibre future and to new Openreach products (SOGEA and SOTAP), smaller exchanges (typically BT Only exchanges) will be by-passed as traffic is conveyed from cabinets to fewer NGA handover points. We also plan to rationalise the exchange estate (from 5,600 to 1,100) to deliver efficiencies as this occurs.[118] In the context of these industry changes, take-up of dark fibre can be expected to be low and short-lived.

5.24 But if we are wrong and there is take-up, our rationalisation plans may be delayed as well as the realisation of efficiencies that we would otherwise pass through to customers. Ultimately industry needs a lower cost operating model for Openreach. The exchange closure plan and move to all IP will enable this. It would be a poor outcome for customers if this project was delayed; and a poor experience for CPs if they had to move from exchanges which were closing where they had recently invested in dark fibre.

Dark fibre can't be justified on the basis it will enable infrastructure build in marginal access areas

5.25 Ofcom believes that the backhaul routes it considers to be uncompetitive (i.e. those from BT Only exchanges) nonetheless connect access areas where rival access networks could be built (in marginal areas). Further, that lower backhaul costs (from dark fibre) could enable such competitive investment because backhaul costs are a consideration when building new access networks.[119]

5.26 It is not disputed that backhaul costs are a consideration when building new access networks. It is, however, highly questionable whether the reductions in cost which Ofcom's remedy will generate will be sufficient to change build decisions. [✂].

5.27 The access areas in question (near to BT Only exchanges) are likely to be more remote and therefore more challenging for investment in new access networks. Investment may only be viable for one operator and, in some cases, only with subsidy. Ofcom does not address these issues. There is no reference to the economics of build in more remote areas, and the associated challenges. Nor to Ofcom's likely approach to regulation in these areas which may be more enduring and therefore critical in supporting incentives to invest.

5.28 It is possible that dark fibre might make rival build to certain high value business sites in these areas more attractive, but this cherry-picking may compromise a scale-build of full fibre (supplying across multiple services) by Openreach (or others) that Government would like to see accelerated to prevent these areas being left behind. It might do the

[118] Slides 34-35, https://www.btplc.com/Sharesandperformance/Financialreportingandnews/Quarterlyresults/2017-2018/Q4/Downloads/Slides/q418-slides.PDF

[119] BCMR 2018 Consultation, para 10.17 and 12.1.

same for entities seeking to win bids for any publicly supported build (resulting in additional subsidy requirements).

Dark fibre can't be justified on the basis it will allow providers to better compete on price, service quality and product offering in downstream markets

5.29 We don't think the benefits of dark fibre claimed by Ofcom are substantial (or even exist at all in some cases). Ofcom itself doubts the extent to which dark fibre customers can realise any benefits given its narrow scope. [120] [121]

5.30 Dark fibre, if taken up, will just lower backhaul prices and possibly retail prices. Whilst we see the benefit for customers in lower prices in the short-term, we question how this will help support competitive investment in the digital infrastructure of the future and how it sits with government's steer to Ofcom namely: '*It is the Government's view that promoting investment should be prioritised over interventions to further reduce retail prices in the near term, recognising these longer-term benefits*.'[122]

5.31 We address Ofcom claimed benefits in turn below.

- **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**. Ofcom envisages that CPs will remove Openreach's equipment (to achieve cost savings) and configure their own equipment '*to replicate and replace the functions of Openreach's electronic equipment*'[123] suggesting no significant innovation or service differentiation over the equipment and features already provided by Openreach.
- **Users would be able to make efficient decisions on bandwidth upgrades based on the underlying costs of upgrades.** Ofcom asserts that bandwidth demand is growing rapidly, that CPs will therefore need to upgrade the bandwidth of existing inter-exchange circuits and that dark fibre will lower the cost of upgrading bandwidth and ensures more efficient upgrade decisions.[124] But for the circuits in question, there is little evidence of such demand. BT Only exchanges are located in remote or rural areas and therefore have lower demand for backhaul capacity.[125] Ofcom accepts that any increases in demand will be lower for BT Only

[120] BCMR 2018 Consultation, para 12.9 '*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*.'
[121] BCMR 2018 Consultation, para 12.29 '[w]*e 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*.'
[122] Future Telecoms Infrastructure Review, page 2.
[123] BCMR 2018 Consultation, para 12.18.
[124] BCMR 2018 Consultation, para 12.10 and 12.36.
[125] BCMR 2018 Consultation, para 7.64. This is one of the reasons given by Ofcom for these exchanges being BT Only and not attractive for rival backhaul providers.

exchanges than for BT+1 and BT+2.[126] Nor is it clear that current pricing is constraining such demand or altering any upgrade decisions.[127]

- **Users would be able to eliminate inefficient active equipment duplication**. We do not dispute that some savings may be available by changing equipment configurations in some cases. But Ofcom has not shown that there are material benefits for the circuits in question.[128] Ofcom itself concedes that net savings (allowing for the required investment by CPs in systems and processes to enable services to be provided and managed over dark fibre) are unclear, and this could limit the uptake of dark fibre.[129] Nor has Ofcom sufficiently addressed the complexities that arise where CPs replace Openreach equipment that is critical to operational performance, in particular, repair times and lower operational costs. There are likely to be additional costs for Openreach in dealing with faults resulting from the removal of equipment and that these have not been properly assessed by Ofcom (as set out in the Openreach submission).
- **Users would potentially be able to deliver improvements more quickly than they can currently**. Ofcom has not addressed the arguments made by BT as part of the 2016 Appeal that innovation in service features is unlikely beyond niche developments.[130] We continue to doubt that dark fibre provides significant flexibility for CPs to innovate or differentiate their business model (for the reasons set out in our evidence to the Tribunal which Ofcom has ignored). The reality is that innovation in transmission equipment is driven by dynamics between equipment providers in a global market, not by the availability of regulated dark fibre in a narrow segment of the UK business connectivity market.

5.32 Dark fibre is unlikely, therefore, to deliver material benefits in downstream markets envisaged by Ofcom namely allowing '*providers to better compete on price, service quality and products offering*'.[131]

Any benefits are not significant over and above the benefits available from OSA Filter Connect

5.33 If benefits do exist, we don't think they are significant over and above the benefits available from OSA Filter Connect. This is a product launched by Openreach to enable it to compete more effectively for customers with high bandwidth demand (as in the fixed

[126] BCMR 2018 Consultation, para 12.86.

[127] BCMR 2018 Consultation, para 12.12. Ofcom notes the difference in price between an EAD 10 Gbit/s service and a 1 Gbit/s service (of £3,866) and simply asserts that a CP who may be willing to pay the cost of such an upgrade (of £1,588), may not be willing to pay such a price premium. But it does not show that – where such a need exists – current pricing is constraining such demand or altering upgrade decision (which would require price elasticity evidence).

[128] BCMR 2018 Consultation, para 12.17. Ofcom envisages cost savings from reductions in the overall amount of equipment employed compared to the current use of active products. Ofcom illustrates this by citing the costs of electronics allocated to an Openreach EAD 1 Gbit/s circuit of approximately £574.

[129] BCMR 2018 Consultation, para 12.26 and 12.27, '*in instances where potential net savings are lower, we would expect less take-up of dark fibre*.'

[130] Ofcom ignores the material lodged at the CAT including statements of fact from BT's engineers. These statements set out evidence and argumentation on: (i) the nature of the 'thin slice' for dark fibre access; (ii) the fact that differences in interfaces are unlikely; and (iii) the low likelihood that dark fibre offers greater flexibility for CPs to differentiate their commercial models. These points, which were set out in the Second and Third Witness Statement of Mr Reid in BT's appeal of the 2016 BCMR, still apply.

[131] BCMR 2018 Consultation, para 12.63.

backhaul segment). Ofcom accepts that it offers 'some' of the benefits of dark fibre (including low cost bandwidth upgrades), but notes that its pricing makes it more suitable to those with requirements for bandwidth over 10 Gbit/s.[132]

5.34 This underplays the benefits of OSA Filter Connect significantly. OSA Filter Connect largely matches dark fibre in the flexibility it provides to upgrade bandwidth at low cost and to self-determine equipment added to wavelength channels beyond the first. More importantly, no consideration is given to how the product might evolve. Ofcom accepts that pressure could be placed on the pricing (and quality) of OSA Filter Connect by regulated dark fibre,[133] but does not recognise the pressure from DPA which could spill-over into this segment even if DPA is less widely used.

Ofcom's proposed dark fibre pricing raises a number of issues

5.35 There are a number of pricing issues relating to dark fibre that we are concerned about:

- **The proposed dark fibre pricing structure will inappropriately restrict Openreach's pricing freedom for active services.** Ofcom accepts this: '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.'[134] As explained above, Ofcom has not identified a strong case for mandating dark fibre, nor has it identified, with sufficient confidence, routes which are uncompetitive. It cannot justify, therefore, a regulated pricing approach which removes the commercial flexibility currently available to Openreach to set prices for its active services to efficiently (in an allocative sense) recover its costs, whilst allowing as many customers as possible to buy leased lines.[135]
- **Aggregation has not been appropriately reflected in the dark fibre pricing proposals.** Dark fibre can substitute for multiple Ethernet circuits (on the same route (known as 'aggregation'). Ofcom regards this an important benefit of dark fibre.[136] But where these opportunities exist, the dark fibre price should be set to ensure the same contribution to common costs for a single dark fibre circuit, as would be made by the multiple Ethernet circuits that are substituted. Openreach calculates that, on average, (for the routes in question) there are [✂] Ethernet circuits that would be substituted by a single dark fibre. To ensure the same contribution to common costs, the allocation (of main links) cost to the dark fibre price should be increased (as set out in the Openreach submission). We are also concerned that Openreach should be able to fully recover the costs of assets in place and not be exposed to under-recovery where a purchaser rationalises the number of fibre strands they utilise.

[132] BCMR 2018 Consultation, para 12.32.
[133] BCMR 2018 Consultation, para 12.33.
[134] BCMR 2018 Consultation, para 12.36.
[135] BCMR 2018 Consultation, para 12.37. The benefit is described in footnote 322 as follows '*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*.'
[136] BCMR 2018 Consultation, para 12.46.

- **The level of the proposed FAC-based price is wrong**. More generally, the Openreach submission sets out why the proposed dark fibre prices are too low and will not recover direct costs plus a mark-up. This is due the exclusion of certain fixed and common costs and the use of inappropriate parameters for assessing costs in certain case. Openreach also argues that allowance over FAC should be included to create the right incentives for CPs to reduce faults.

  The dark fibre remedy is applicable to smaller, mainly rural exchanges where fibre utilisation is lower than average (resulting in higher than average costs). But Ofcom's estimate of FAC is based on a cost allocation which is averaged across broader areas. It therefore significantly under-estimates the cost to recover the de-averaged cost of the actual duct and fibre in use for the relevant dark fibre circuits.

6 Ofcom materially underestimates the cost of capital in the BCMR

6.1 Ofcom has lowered its WACC estimate for the BCMR to 8.0%, from 9.8% (nominal, pre-tax) in its 2016 BCMR and 8.9% in the 2018 WLA. Ofcom continues with its disaggregated WACC approach, disaggregating the BT Group WACC into 'Openreach Access', 'Other UK Telecoms' and 'Rest of BT'. The 'Other UK Telecoms' WACC is applied to business connectivity markets, and specifically to dark fibre at BT-only exchanges in Ofcom's current BCMR proposals (where it proposes a cost-based charge control).

6.2 Ofcom's reduction in the WACC for 'Other UK Telecoms' relative to the 2018 WLA is driven by three principal changes:

- A reduction in the real total market return (TMR), the sum of the risk-free rate and the equity risk premium (ERP), from 6.3% to 5.8% in real terms against RPI.
- A reduction in the real risk-free rate, from 0% to -1.25% in real terms against RPI.
- A reduction in the asset beta, from 0.73 to 0.65.

6.3 We have major concerns with all three of the above changes. Given the Government's stated aim of encouraging fibre investment, it would be inappropriate of Ofcom to lower its estimate of the cost of capital at this time, as it would constrain Openreach's ability to invest. Ofcom recognises the uncertainty around its estimates of individual parameters underpinning its WACC calculation, and we believe it should exercise caution to preserve Openreach's incentive to invest. Ofcom's proposed reduction in the 'Other UK Telecoms' WACC from 8.9% in its March 2018 WLA decision to 8.0% in its BCMR consultation, in the space of only eight months, is inconsistent with this Government objective to promote investment.

6.4 We explain our concerns with Ofcom's changes further in Annex 2, but in summary:

- **Total market return**: Ofcom places too much weight on some specific forward-looking dividend growth model 'DGM' evidence, whilst ignoring other DGM-based estimates. Given that the DGM requires the use of subjective assumptions that produce a wide confidence interval for estimates, we believe that long-run historical evidence, based on actual observed returns, remains the most objective method for setting the expected TMR, and also captures the inherent stability in the TMR over time. We believe a real TMR (CPI-deflated) of 7.0%, based on long-run historical evidence, as opposed to Ofcom's estimate of 6.7%, is the most reliable estimate for this BCMR.
- **Risk-free rate:** Ofcom uses short-run averages of gilt yields, which result in unstable estimates across regulatory reviews that create unnecessary uncertainty for investors. Whilst long-run historical averages suggest a real risk-free rate slightly below zero, we show that interest rates are set to increase over the period. Given this, we believe that Ofcom's March 2018 real-risk free rate estimate of 0% remains appropriate. A real risk-free rate estimate of 0% is also consistent with ten and fifteen year historical averages of gilt yields, capturing the expectation that interest rates are expected to increase towards their long-run historical average in the coming years.

- **Asset beta**: Ofcom's estimate of 0.65 underestimates the asset beta for business connectivity markets, because it does not recognise that these markets tend to be more risky than the other services that fall within 'Other UK Telecoms'. There has been no material change in the systematic risk of business connectivity markets since Ofcom's 2016 BCMR decision. We therefore believe its 2016 BCMR beta estimate of 0.70 remains appropriate.

6.5 We also estimate a higher cost of debt based on the higher risk-free rate above, which is a consequence of Ofcom's approach to estimating the cost of new debt as the sum of the risk-free rate and debt premium. A higher risk-free rate of 0% increases Ofcom's cost of new debt estimate from 2.9% to 4.2%, and consequently increases the overall cost of debt from 4.0% to 4.2%. We agree with Ofcom's move towards calculating the cost of debt as a weighted average of existing and new debt costs, including its calculation of the cost of existing debt based on BT's actual embedded debt costs.

6.6 Reflecting these amendments to the Ofcom approach, we estimate a WACC (nominal, pre-tax) for BCMR of 8.8% compared to Ofcom's estimate of 8.0% as set out below.

Table 1: WACC Estimate with BT's proposed amendments

	Ofcom Estimate	BT Estimate
Real RFR	-1.25%	0.0%
RPI	2.9%	2.9%
Nominal RFR	1.6%	2.9%
Nominal ERP	7.2%	6.3%
Debt beta	0.10	0.10
Asset beta	0.65	0.70
Asset beta weight	65%	65%
Fwd-looking gearing	35%	35%
Equity beta	0.95	1.02
Cost of equity (post-tax)	8.4%	9.3%
Cost of equity (pre-tax)	10.2%	11.3%
Debt premium		
Corporate tax rate	17%	17%
Cost of debt (pre-tax)	4.0%	4.2%
WACC (pre-tax nominal)	**8.0%**	**8.8%**

6.7 Annex 2 sets out considers Ofcom's proposed approach to estimating each of the three parameters above, and propose alternative estimates.

AlixPartners

The competitive impact of duct and pole access on the BCMR 2019

Report prepared for British Telecommunications plc

25 January 2019

About this Report

This report ("Report") was prepared by AlixPartners UK LLP ("AlixPartners") exclusively on instructions from and for the sole benefit and use of British Telecommunications plc (“BT”) in respect of its potential responses to Ofcom’s consultation on the Business Connectivity Market Review published by Ofcom on 2 November 2018.

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AlixPartners’ economists help clients face significant antitrust, litigation, regulatory and commercial challenges. In these situations, the outcome often depends on a proper understanding of relevant economic theory and a rigorous approach to collating and assessing empirical evidence. We support companies and their counsel by providing expert evidence, testimony and advice to address the most important issues when it really matters.

Our clients benefit from the responsiveness and resources of a global firm with local teams in Chicago, London, Los Angeles, New York, Tokyo, and Washington, DC. We also draw on an academic affiliate network with specialist capabilities. Credible economic analysis often also depends on robust evidence on accounting and data issues, and extensive industry knowledge. Accordingly, our economists work closely with our forensic accounting, data analytics, and industry experts to provide an integrated approach.

Contents

Redacted Openreach and BT confidential information is denoted by [✂].

Executive Summary

Introduction

1 On 2 November 2018 Ofcom published a consultation on the Business Connectivity Market Review ('BCMR') for the period April 2019 to March 2021 ('BCMR 2019'). The BCMR concerns the wholesale markets for business connectivity services which are used by to provide high capacity services to businesses, mobile network operators and communications providers ('CPs').

2 This report considers the appropriate approach to market analysis and remedy design in the BCMR 2019. In particular, it sets out why Ofcom has erred in its analysis, by taking little or no account of the market changes that appear likely to occur during the review period due to improved access to BT's duct and pole network ('DPA'). This omission undermines the robustness of Ofcom's findings of significant market power ('SMP'), which calls into question the appropriateness of the remedies it proposes.

Background

3 Following the conclusion of the Digital Communications Review, Ofcom is implementing a strategic shift to encourage investment in new ultrafast fibre networks. Ofcom has stated that it intends to achieve this strategic shift by improving access to BT's network of ducts and poles to allow rival CPs to connect their own fibre optic cables directly to homes and businesses at a lower up-front cost.[1]

4 Accordingly, Ofcom required Openreach to make several improvements to its regulated Physical Infrastructure Access ('PIA') product in the Wholesale Local Access Market Review ('WLAMR') 2018. A key element of these changes was the relaxation of existing usage restrictions to allow it to be used for 'mixed usage' purposes. Under 'mixed usage' DPA ('MUDPA') CPs can deploy fibre to provide leased line services provided that the primary use of DPA is to provide consumer broadband services. While elements of the MUDPA changes have already been put in place by Openreach, MUDPA is expected to be fully implemented by April 2019.

5 On 2 November 2018 Ofcom published a consultation on the Physical Infrastructure Market Review ('PIMR') covering the same period as the BCMR 2019. Ofcom proposes in the PIMR to mandate that BT provides unrestricted nationwide DPA ('UDPA'). Based on Ofcom's current proposals, UDPA will be similar to MUDPA with the key difference being that CPs can use UDPA without any restriction on whether they provide broadband or non-broadband services. Ofcom proposes that UDPA will be available a month following the PIMR Statement and will therefore be available for the vast majority of the BCMR 2019 review period.[2]

6 UDPA is a key element of both the UK government and Ofcom's strategy. In its July 2018 Strategic Policy Position, paragraph 1.16, Ofcom stated:

> *"We plan to introduce proposals that seek to provide unrestricted access to Openreach's ducts and poles nationwide. An unrestricted remedy would provide greater flexibility, better reflecting the needs of operators investing in full-fibre networks to provide a range of*

[1] Ofcom 2016 *Making Communications Work for Everyone*, para. 1.23.

[2] If Ofcom decides not to require BT to provide UDPA CPs would still be able to use the MUDPA remedy throughout the review period.

services; for example, initially leased lines to businesses, and later broadband to homes." (Emphasis added)

7 The BCMR 2019 requires a forward-looking assessment of whether competition will be effective in the relevant markets during the review period considering expected or foreseeable market developments. Ofcom can only impose remedies on operators that it identifies as having SMP in those markets, which implies that there would be insufficient competitive constraints on the SMP operator(s), absent intervention.

8 Ofcom's analysis of competitive constraints in the BCMR 2019 focuses on the ability of rival CPs to use their own network infrastructure to contest contracts for business connectivity services. However, the competitive impact of DPA is not considered by Ofcom in its market definition analysis, and only to a limited extent in its SMP assessment.

9 Ofcom recognises that regulated access to BT's physical infrastructure, including DPA, will allow competition to emerge more strongly in broadband and business connectivity markets downstream of physical infrastructure.[3] However, Ofcom appears to consider that CPs' usage of DPA will be limited during the BCMR 2019 review period, and therefore will be insufficient to result in effective competition by 2021. Ofcom does not, however, set out any detailed evidence to support this view.

Taking appropriate account of DPA would likely lead to material changes in Ofcom's conclusions on market analysis

10 We consider that DPA is likely to have a material impact on competition in business connectivity markets in the BCMR 2019 review period in many areas. CPs can take advantage of the improvements in BT's current PIA product mandated in the WLAMR 2018 already for mixed usage deployments[4], and the proposed UDPA remedy will become available shortly after the BCMR Statement in spring this year. This increases CPs' ability and incentive to deploy fibre, including in business connectivity markets only, resulting in a material increase in the competitive constraints on BT as a result.

11 Ofcom has not fully taken DPA into account and consequently its analysis of the wholesale business connectivity markets is not robust. Ofcom's current approach risks imposing regulatory remedies inappropriately in areas where effective competition either exists now or is likely to emerge during the review period.

CPs will be able to use DPA to provide leased lines from the start of the BCMR 2019 review period

12 CPs will be able to take advantage of improvements in BT's DPA product (in particular the relaxation of usage requirements allowing leased lines to be targeted) from the start of the BCMR 2019 review period.

- **Ofcom addressed the main historical limitations of BT's DPA product in the WLAMR 2018.** Ofcom directed BT to make extensive changes to improve its PIA product through the

[3] For example, see PIMR, para. 1.12.

[4] i.e. the deployment of local access networks offering both broadband and non-broadband services, provided the primary purpose of the network deployment is the delivery of broadband services.

introduction of MUDPA in WLAMR 2018. Ofcom has had a key role ensuring these changes are implemented including via hosting the Duct and Pole Implementation Progress Meetings which are chaired by Ofcom's CEO.

- **The proposed UDPA remedy is essentially the same product as MUDPA** but without usage restrictions thereby allowing business customers to be targeted solely, without the need to demonstrate an intent to deploy consumer broadband. Accordingly, UDPA will be a familiar product to CPs which they can use from launch.

- **UDPA will be available for the vast majority of the BCMR review period**. Assuming Ofcom proceeds with its proposals, and UDPA is based on MUDPA, it will be ready to use as soon as it is introduced. As set out above, under Ofcom's current proposals, UDPA will be available a month following the PIMR Statement and will therefore be available for the vast majority of the BCMR 2019 review period.

- **Many CPs have already gone through Openreach's process to enable them to use UDPA at launch.** At December 2018, [✂] have been established to use BT's DPA products meaning they can place live orders. A further [✂] CPs ([✂]) are in the process of becoming 'established'.

DPA increases CPs' ability and incentive to deploy their own fibre

13 The improvements to DPA made in the WLAMR 2018, and the proposed introduction of UDPA, will allow CPs to deploy their own fibre more cheaply, rapidly and in more locations than using only their own physical infrastructure, resulting in effective competition in many more situations:

- **DPA enables CPs to deploy their own fibre more rapidly.** Deployment of own fibre using DPA reduces the need for time-consuming civils works.[5] Furthermore, CPs can determine deployment speed (absent the need for network adjustments), since Openreach has little involvement in provisioning duct access.

- **DPA allows CPs to better control the customer experience.** CPs using DPA are not reliant on Openreach to provision equipment to their customers or for making the physical infrastructure connections to their premises.

- **DPA significantly reduces own-fibre deployment costs.** DPA allows CPs to deploy fibre at lower cost by reducing the need to invest in civil infrastructure. The cost reduction will be larger where CPs use DPA to aggregate demand in a specific area (e.g. serving adjacent business premises themselves or aggregating demand from several CPs).

- **DPA significantly reduces the risks of own-fibre deployment.** If CPs invest in their own physical infrastructure assets, such as duct, this involves large, sunk investments in long-lived assets. The economic life of these assets is well beyond the typical minimum contract term for retail leased lines of up to 5 years. Investing in own build duct for specific leased lines

[5] DPA involves less extensive survey and planning work, requires less extensive wayleaves and other permissions (e.g. road closures), and avoids the time-consuming construction work to create and install the necessary civil infrastructure.

customers can therefore raise risks of stranded assets for CPs. DPA significantly reduces such stranded asset risks.

- **DPA allows CPs to extend their networks, reducing the costs for serving future customers.** Using DPA instead of purchasing Openreach wholesale Ethernet circuits allows CPs to extend their networks, which reduces the costs of connecting new customers in future. We expect CPs to pursue such opportunities to develop their networks as soon as they can within the BCMR 2019 review period. CPs will face a particularly strong incentive to use DPA to self-provide higher value circuits, such as very-high bandwidth ('VHB') circuits (either as part of a mixed-usage deployment, or on an individual circuit basis using UDPA).[6]

This is likely to increase the competitive constraints on BT in many areas

14 The availability of DPA will mean that it is profitable for CPs to serve business connectivity end-users that are located much further from their existing network (as illustrated in Figure 1 below). This will reduce CPs' reliance on Openreach's wholesale Ethernet services and constrain Openreach's ability to set the terms for its wholesale business connectivity products independently of rivals in many geographic areas.

- **DPA enables CPs to provide their own fibre connections to end users at lower cost** than the cheapest Openreach wholesale Ethernet services (100Mbit/s EAD LA services) for distances up to around 300m even taking just a three-year payback period. For higher bandwidth services DPA is lower cost than the Openreach wholesale Ethernet service for even greater distances. For example, for 10Gbit/s EAD LA services it would be cheaper to use DPA to provide own-fibre connections for distances over a kilometre.[7]

- **DPA allows CPs to economically address demand located 10 times further away from their existing networks than own-build network extensions.** Our analysis of Ofcom's economic dig distance model implies that the cost to CPs of using their own physical infrastructure (e.g. their own duct) is at least 50% of the total costs of self-providing leased lines. DPA therefore allows CPs to avoid a significant proportion of own-build costs. Our analysis shows that CPs can address demand 10 times further away from their existing network with their own fibre using DPA.

- **The impact of DPA will be even greater where it is used to provide multiple circuits.** This is likely in three separate types of deployment. First, CPs can use DPA to aggregate multiple business connectivity circuits in an area (e.g. use DPA to run a single cable with multiple fibres into a business park to connect several customers). Second, firms[8] can aggregate demand from multiple CPs and use DPA to improve the economics of own network build. Third, CPs can already use DPA strategically as part of a wider, multi-service FTTP deployment to a broader region or area that exploits the economies of density and scope that arise using DPA.

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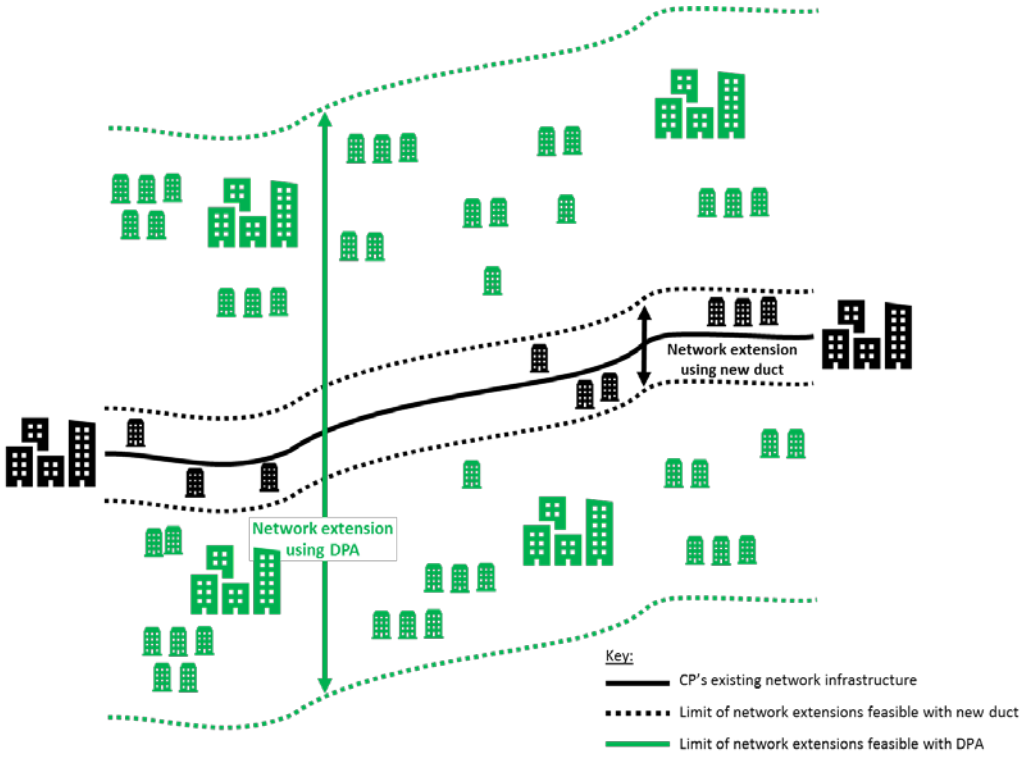
6 As the charges for Openreach's wholesale Ethernet services that are avoided by self-building are higher.

7 This is based on our analysis of Ofcom's economic dig distance model, released alongside the BCMR 2019 consultation which we have adjusted to incorporate DPA. Our adjustments to Ofcom's model are explained in Annex A1. As we have adopted a conservative approach to incorporating DPA into Ofcom's modelling, the economic deployment distances using DPA could be materially greater than we have set out here.

8 We understand that SSE Enterprise Telecoms is an example of such a firm.

Figure 1: Stylised illustration of the impact of DPA on CPs' ability to reach business sites



Source: AlixPartners

DPA has important implications for the analysis of the wholesale business connectivity markets in BCMR 2019

15 We expect the improvements in DPA and the proposed usage restriction removal to result in a material increase in competitive constraints on BT in the review period.

- **DPA will allow CPs to address many more business sites** that are located much further from their networks and do so more competitively than with own build (or using Openreach's wholesale Ethernet products).

- **DPA will increase the number of CPs capable of serving business sites within given areas,** including in the HNR Metro areas identified by Ofcom.

- **DPA will lead to a sustained reduction in the cost of rivals' network deployments that will increase the potential for competition** providing a competitive constraint on BT's prices, potentially in advance of actual competitive network deployment and before the emergence of observable changes in network presence in market shares. The competitive constraint can be expected to arise in two ways. First, DPA will increase the likelihood of CPs using DPA (in combination with their own or third-party fibre) rather than Openreach's wholesale Ethernet services (all else being equal). This increased threat of switching will directly constrain Openreach's Ethernet services. Second, Openreach will also face a constraint if it expects its Ethernet customers (i.e. CPs) to face greater retail competition from rivals bidding for contracts based on using lower cost DPA-based services. Neither of these

constraints rely on CPs currently using DPA, or in the case of indirect constraints, bidding being based on using DPA. Rather, they rely on Openreach considering the use of DPA by rival CPs to be sufficiently credible. Given that Ofcom plans to mandate DPA on a UK wide basis, including for business connectivity deployments only, competitive constraints from potential or likely network presence will affect BT's incentives in many areas (including the CLA).

Implications for Ofcom's market definition analysis

16 Ofcom's geographic market definition analysis is based on the costs of self-build and explicitly excludes any impact of DPA.

- **Using an appropriate buffer distance would likely result in many more postcode sectors being classified as 'high network reach' areas.** The sensitivity analysis undertaken by Ofcom[9] shows that increasing the buffer distance[10] from 50m to 100m, the number of postcode sectors classified as 'high network reach' ('HNR') more than doubles (i.e. from 576 to 1,261), and the number of postcode sectors categorised as 'BT Only' falls by over 20% (i.e. from 5,810 to 4,575). Our analysis suggests that a 100m buffer distance would still be highly conservative and a more appropriate assumption would be a minimum of 300m. Using a 300m buffer distance would likely result in many more postcode sectors being more appropriately reclassified from BT+1 or BT Only to being HNR areas.

- **For CI Inter-Exchange we would also expect a material increase in the number of exchanges which would have one or two CPs present in the review period.** DPA will also reduce the costs for CPs of establishing a presence at additional BT exchanges. Our analysis using Ofcom's economic dig-distance modelling shows that, with DPA, CPs will find it economic to deploy their own fibre over much longer distances for VHB connections.[11] For example, assuming a 7-year economic life[12] it would be more cost effective for CPs to use DPA than EAD LA 10Gbit/s for circuits up to c.1.6km.

17 It is difficult to quantify the precise impact of this on the CI Inter-Exchange market definition as Ofcom's quantitative analysis of the inter-exchange market is limited. In particular, Ofcom only provides information on measures of average distance between BT exchanges and the 1st and 2nd closest rivals. For 'BT Only' exchanges, the average distance to rivals is substantial – more than 6km. However, within these averages we would expect considerable variation for individual exchanges – for many exchanges the distances will be less than 6km. It is important to consider the potential for CPs to build out to an exchange on an individual exchange basis. This requires a disaggregated analysis, which Ofcom has not set out. It is likely that there will be some of the 'BT Only' exchanges for which DPA will enable multiple CPs to deploy their own fibre. This is

9 As set out in Table A13.1 of the BCMR 2019 consultation.

10 Buffer distance is the distance over which a CP can extend its network to serve a customer. We are unable to model the precise impact of a more appropriate buffer distance assumptions as we do not have access to Ofcom's information on CP network locations.

11 CPs typically require considerably higher bandwidth for exchange connectivity, therefore it is relevant to consider VHB circuits.

12 CPs are likely to consider longer time horizons for investments in improving exchange connectivity than customer-specific deployments since the payback on the investment is not specific to any one customer or service.

particularly likely where CPs have multiple VHB circuits connected to them or could do so over the review period.

Implications for Ofcom's assessment of SMP

18 Ofcom's SMP assessment in the CI Access market is largely predicated on BT's control of its duct and pole network. As explained above, DPA will allow BT's downstream rivals equivalent access to this network**,** therefore ensuring that the competitive advantages that BT has historically derived from this will be available to all CPs.[13] However, Ofcom considers that DPA will have no material impact on its SMP analysis for CI access services on the basis that usage will only be limited during the review period.

19 Our analysis suggests that Ofcom should reconsider its SMP findings taking into account the impact of DPA on CPs' ability and incentive to deploy their own networks within the review period. In our judgement, if it was to do so Ofcom would likely find materially more areas will tend towards being effectively competitive over the review period. Furthermore, Ofcom should place greater weight on the impact of DPA on actual and potential competition rather than historic market shares that do not reflect the competitive constraints on BT over the review period. This is particularly the case in HNR Metro and other HNR areas where CPs already have a material degree of network presence which is located closer to customer sites.

20 In the CI Inter-Exchange market our analysis of deployment distances using DPA indicates that CPs could profitably extend their network over longer distances than those considered by Ofcom based on self-build costs. Ofcom should assess the competitive impact of DPA on individual exchanges to assess the potential for network competition. This is likely to show that more BT-only and BT+1 exchanges are prospectively competitive over the review period and hence should not be found to have SMP.

Implications for remedies

21 Ex ante remedies should only be applied in markets where BT has SMP and the design of those remedies should be sensitive to the degree of market power. This is important to minimise the risk of deterring fibre investment by distorting CPs' incentives to deploy their own infrastructure. Given the overarching aim of Ofcom's strategy is to promote competitive investment in full-fibre networks, this calls for a conservative approach to remedies which errs on the side of caution and gives this investment and competition a chance to develop.[14]

22 While Ofcom does allow for some geographic variation in remedies, our analysis suggests that it has not appropriately assessed the potential competitive impact of DPA. This undermines the robustness of Ofcom's proposed market analysis findings, with the risk that the proposed regulatory remedies are incorrectly applied in areas where effective competition either exists now or is likely to emerge during the BCMR 2019 review period.

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13 We note that Ofcom proposes to impose a 'no undue discrimination' on BT that applies to all forms of network access provided by BT in each Physical Infrastructure market. See PIMR 2019, para. 4.22 to 4.41.

14 See Ofcom, 2018. *Regulatory certainty to support investment in full-fibre broadband*, para.4.15.

23 Where Ofcom has taken into account DPA and finds that BT has SMP, it is also important that it considers the increased actual and potential competition enabled by DPA when designing remedies. For example:

- **In HNR Metro areas (and beyond for VHB)**: Ofcom should consider removing the requirement to provide wholesale access in the CI access services market where there is sufficient actual and potential network competition based on DPA. Network investment based on DPA is likely to emerge more rapidly in the HNR Metro areas than elsewhere, since CPs already have material network presence and network deployment distances are typically relatively short.[15] Since DPA will allow CPs to deploy fibre profitably further from their existing networks it is likely to increase their ability to contest a greater proportion of business sites in HNR Metro areas. Moreover, by lowering the cost of network extensions DPA will increase the competitive constraint on BT; the greater threat of entry using DPA can be expected to intensify potential competition in advance of further network deployments. For these reasons, DPA is likely to have a particularly significant impact in the HNR Metro areas, with the result that competitive conditions will be more similar to the CLA. Similarly, given the higher value nature of VHB circuits, CPs can be expected to use DPA to deploy fibre profitability further from their existing network, including outside HNR Metro areas, for these circuits.

- **In other CI access markets:** as set out above, the availability of DPA may mean that for some areas network competition will materially increase during in the review period, but not to the point where Ofcom considers it to be sufficient to alter its SMP finding. In such areas, Ofcom should consider whether it is proportionate to apply more intrusive remedies (e.g. the proposed charge control, minimum quality of service remedies and equality of inputs obligations). The fact that volume or geographic discounts (unlike term discounts) do not count towards charge control compliance reduces Openreach's incentives to lower its wholesale Ethernet prices to win customers in those parts of the country where its costs are lower than average (and to charge more where costs are higher).[16] This restricts Openreach's ability to compete on price and also risks creating an inefficient misalignment of prices and costs distorting CPs' investment incentives. If these distortions result in a higher cost supplier providing services, this would result in higher industry costs. If these higher costs are passed on to customers by way of higher prices, this may lower the take-up of fibre services. Such outcomes are undesirable and would undermine the policy goal of promoting network competition, deregulation and the development of high speed fibre services in the UK.

- **In the CI inter-exchange market:** Ofcom should reconsider its proposal to require BT to provide dark fibre at BT-only exchanges in this review. Ofcom proposes that BT should be required to provide dark fibre only in areas where it is confident that network competition is unlikely to develop in the medium to long term.[17] We agree that it is appropriate to err on the side of caution in view of the risk that regulated dark fibre will undermine fibre investment. However, as noted above, Ofcom would need to consider the impact of DPA on competitive conditions at individual exchanges to fully understand the potential for investment by CPs. In

15 Ofcom's dig distance analysis shows that 80-90% of businesses in the Metro areas have at least two rival networks within 50m (see Table 6.6 of BCMR 2019). Furthermore, in the HNR areas outside the CLA, Ofcom finds that the average distance to the third rival is only 134m, while the for the fourth it is 387m (see Table 6.9).

16 See BCMR 2019 volume 2, para. 5.19.

17 BCMR 2019, para. 10.15.

the absence of such an analysis (and assuming it is possible to conclude with reasonable certainty the DPA would not be sufficiently used), it seems premature to require dark fibre at this stage given the risks to investment.[18]

[18] Without prejudice to the issues BT Group and Openreach raise in their responses to the PIMR and the BCMR challenging the proportionality of the dark fibre remedy.

1 Introduction

Background

24 Ofcom published the Business Connectivity Market Review ('BCMR 2019') consultation on 2 November 2018. This market review concerns the wholesale markets for business connectivity services which are used to provide high capacity services to large businesses, mobile network operators and communications providers. Ofcom is consulting on its regulatory proposals in the BCMR 2019 for the two-year period from April 2019 to March 2021 ('the review period').

25 Ofcom is also considering the related market for telecoms physical infrastructure (e.g. ducts and poles) used to supply fixed communications services in the Physical Infrastructure Market Review ('PIMR') 2019.[19] Ofcom proposes to find that BT has SMP in this market and to require it to provide unrestricted duct and pole access ('UDPA') throughout the UK within one month of the PIMR statement being published in spring 2019.

26 Regulated access to BT's network of ducts and poles is a key element of the UK government and Ofcom's strategy to promote investment in fibre-optic communications networks and increase the availability of high speed broadband and broadband services across the UK. Using DPA, rival communications providers ('CPs') can invest in their own fibre networks using BT's duct and pole network without investing in their own physical infrastructure. This will significantly increase the incentive to invest in fibre networks by lowering the cost and risk of fibre investment.

27 Ofcom required Openreach to make several improvements to its regulated DPA product in the WLAMR 2018. A key element of these changes was the relaxation of existing usage restrictions to allow it to be used for 'mixed usage' purposes. Under MUDPA CPs can deploy fibre to provide leased line services provided that the primary use of DPA is to provide consumer broadband services. While elements of the MUDPA changes have already been put in place by Openreach[20], MUDPA is expected to be fully implemented[21] by April 2019.

28 The proposed UDPA remedy will further increase the attractiveness of DPA by allowing CPs to use it to provide both non-broadband and broadband services without restriction. These changes will give CPs more flexibility in the use of DPA, enabling them to compete for a much larger proportion of wholesale leased lines than before.

29 The improvements to BT's existing DPA product required through MUDPA, and the proposed introduction of UDPA, have important implications for the BCMR 2019 since they are likely to impact on the competitive conditions in the downstream business connectivity markets in the review period. As noted, the improvements in BT's existing DPA product in the WLAMR 2018 will be available from April 2019, and Ofcom proposes that UDPA will be available from spring 2019 (i.e. one month following the publication of the PIMR Statement). This means that CPs will be able to use DPA to provide leased lines for the entire two-year period covered by the BCMR 2019.

19 The BCMR 2019 is intended to ensure that the appropriate regulations are in place when the current SMP regulations expire in March 2019. The PIMR 2019 gives effect to Ofcom's aim to introduce UDPA as an SMP regulation. Both reviews have a two-year time period from April 2019 to March 2021. Ofcom intends to carry out a consolidated Single Access Market Review in 2021.

20 For example, changes to the pricing of Openreach's PIA product were made in May 2018.

21 For example, changes to how Openreach charges CPs for network adjustments and the publication of a new PIA reference offer will be made by April 2019.

Moreover, CPs will have a clear incentive to use DPA to take advantage of profitable opportunities to provide non-broadband and broadband services. This is likely to increase network competition in more areas, strengthening the competitive constraints on BT and eroding its market power in the business connectivity and other downstream markets.

30 Given this, it is important that Ofcom fully considers the competitive impact of DPA in the BCMR 2019 and assesses the implications for market definition, SMP analysis and remedies. However, DPA is not considered in Ofcom's market definition analysis, and only to a limited extent in its SMP assessment. This approach risks understating the competitive impact of DPA in the review period and consequent errors in Ofcom's market analysis which undermine its SMP findings and remedies.

Scope of this report

31 This report set out the reasons why DPA is likely to have a material competitive impact in the review period. It is structured as follows:

- **Section 2** explains the limited consideration given to the competitive impact of DPA in the BCMR 2019 consultation.
- **Section 3** explains how DPA will increase CPs' ability and incentive to deploy fibre in the review period.
- **Section 4** considers the implications of DPA for Ofcom's BCMR 2019 market analysis.

2 Ofcom's analysis of the competitive impact of DPA is limited

Introduction

32 Under the EU regulatory framework Ofcom can only impose ex ante regulations in the business connectivity market on operators that it identifies as having SMP in the relevant market(s) on the basis of a formal market review. The market review process requires a forward-looking assessment of competitive conditions in the wholesale market for business connectivity services that considers both existing market conditions and expected or foreseeable market developments over the review period.[22]

33 Since the purpose of the BCMR 2019 is to determine whether ex ante regulation is necessary, Ofcom's market analysis must consider whether competition is effective, or is likely to become effective over the review period, absent SMP regulation in the business connectivity market (following the Modified Greenfield approach). It is crucial, however, to fully consider the impact of SMP regulations in related markets that could affect competitive conditions in business connectivity markets. These include the proposed UDPA regulation in the upstream physical infrastructure market, and the MUDPA remedy in the WLAMR 2018:

- **The MUDPA remedy:** this remedy mandates regulated access to BT's ducts and poles through Openreach's Physical Infrastructure Access ('PIA') product.[23] CPs can use PIA to deploy local access networks offering leased line and broadband services, provided the primary purpose is the delivery of broadband services.[24]

- **The UDPA remedy:** assuming Ofcom proceeds with its current proposals, UDPA will be the same in all important respects to MUDPA except there will be no restriction on the mix of broadband and non-broadband services delivered by CPs.[25] Under Ofcom's current proposals, BT must make UDPA available within one month of the PIMR 2019 statement in the spring of 2019, and we understand that it will replace MUDPA at this time.

DPA is central to Ofcom's full-fibre vision

34 As noted earlier, DPA is a key element of Ofcom's regulatory strategy to promote competitive investment in fibre networks. Absent regulated access to BT's ducts and pole networks, rival CPs that wish to deploy their own fibre networks must incur the costs and risk of building infrastructure needed to host network cables and equipment.

22 See Annex A2 for further detail on Ofcom's proposals in the BCMR and PIMR 2019.

23 PIA is the regulated wholesale service provided by Openreach in relation to the SMP obligation to provide duct and pole access to rivals.

24 This remedy relaxed the usage restriction prohibiting CPs from using BT's ducts and poles to provide non-broadband services that has been in place since Ofcom first imposed the PIA remedy in its Wholesale Local Access Market Review 2010. Openreach implements the requirement for MUDPA to be used for the primary purpose of the deployment of broadband services by requiring CPs to use PIA to provide leased lines to residential broadband connections in the ratio of at least 30:1.

25 UDPA allows CPs to use PIA to supply only leased lines should they wish to do so.

35 While rivals can, and do, build fibre networks that do not rely on DPA[26], this is more typically viable in areas of high demand where the prospective revenues are sufficient to warrant the sunk cost investment in physical infrastructure or where they have found ways to deploy network in a more cost-effective way.[27] In other areas, access to physical infrastructure can be a barrier to entry and expansion to competitive network investment.

36 DPA reduces the barriers to competitive fibre investments by allowing rival operators to deploy their own fibre using BT's duct and pole network on regulated terms. Ofcom considers that this will promote fibre investment by making it easier and quicker for rivals to rollout fibre without large investments in infrastructure. The proposed UDPA remedy is intended to further increase the attractiveness of DPA by allowing CPs to use BT's PIA product to provide leased line services as well as broadband services without restriction:

> *"We plan to introduce proposals that seek to provide unrestricted access to Openreach's ducts and poles nationwide. An unrestricted remedy would provide greater flexibility, better reflecting the needs of operators investing in full-fibre networks to provide a range of services; for example, initially leased lines to businesses, and later broadband to homes."*[28] *(Emphasis added)*

37 The advantages offered by UDPA, along with the improvements to the PIA product implemented in the MUDPA remedy, will increase CPs' ability and incentive to deploy their own fibre networks. As noted above, this will affect competitive conditions in business connectivity markets during the review period and should therefore be considered in detail in the BCMR 2019.

Ofcom only provides limited analysis of the competitive impact of DPA in the BCMR 2019 consultation

38 In practice, Ofcom's market analysis in the BCMR 2019 consultation focuses on the competitive constraints from self-build network deployment and there is little explicit analysis of the competitive impact of either MUDPA or UDPA. For example, Ofcom does not consider DPA its market definition analysis:

- **DPA is not included in Ofcom's Modified Greenfield approach:** Ofcom states that its market definition analysis for CI access services takes into account the remedies imposed in the WLAMR 2018 in relation to PIA.[29] However, it is unclear how it has done so in practice.

- **Ofcom's network reach analysis only considers self-build:** The analysis of dig distances that underpins Ofcom's network reach analysis for CI access services is based on the costs associated with self-build of network extensions and does not consider the lower costs of deploying fibre using DPA.[30]

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26 [✂]

27 For example, SSE Enterprise Telecoms has a deal with Thames Water to lay fibre optic cables throughout its waste water network.

28 https://www.ofcom.org.uk/__data/assets/pdf_file/0025/116539/investment-full-fibre-broadband.pdf, para. 1.16.

29 See BCMR 2019, para. 4.20.

30 Ofcom explicitly states that the impact of a DPA remedy is not factored into its network reach analysis, which is a fundamental part of its geographic market analysis (see BCMR 2019, para. 5.8).

39 In addition, Ofcom gives only limited consideration to the implications of DPA in its SMP analysis:

- **DPA is dismissed as immaterial in Ofcom's SMP analysis for CI access services:** Ofcom states that any usage of DPA in BT-only and BT+1 markets is unlikely to be widespread within the BCMR 2019 review period and is therefore unlikely to result in effective competition by 2021.[31] Similarly, Ofcom considers that CPs' network expansion plans indicate an absence of potential competition in each of the HNR Metro Areas and in the HNR areas in the rest of the UK.[32]

- **Limited impact of DPA at BT-only exchanges:** Ofcom argues that DPA will not result in effective network competition in the inter-exchange services market at BT-only exchanges in the medium to long-term.

40 Ofcom does, however, give some limited recognition to the potential competitive impact of DPA in its analysis of remedies. For example, Ofcom cites the potential for network deployment using DPA as part of the reason for proposing lighter remedies in HNR Metro and other HNR areas.[33] Similarly, Ofcom states that it will not mandate dark fibre at BT+1 exchanges in the inter-exchange market because of the potential for fibre deployment to these exchanges using DPA.[34]

41 Ofcom's limited consideration of DPA appears to reflect its view that any use of BT's ducts and poles by CPs will be limited during the two-year period of the BCMR 2019 and not sufficient to result in effective competition by 2021. However, Ofcom does not provide any substantive analysis of the likely impact of either the extensive changes BT is making to improve its PIA product following the WLAMR 2018, or the proposed removal of usage restrictions in the PIMR 2019, both of which will increase rivals' ability and incentive to deploy fibre networks.

31 See BCMR 2019, para. 6.70.
32 See BCMR 2019, para. 6.94.
33 See BCMR 2019, para. 10.30.
34 See BCMR 2019, para. 10.20.

3 DPA increases CPs' ability and incentive to deploy fibre in the BCMR 2019 review period

Introduction

42 In this section we explain the reasons why DPA has the potential to materially alter competitive conditions in the review period covered by the BCMR 2019. In short, CPs will be able to use an improved DPA product (i.e. either MUDPA or UDPA) to provide leased lines for the entire two-year period covered by the BCMR 2019, thereby materially improving CPs' ability and incentive to deploy fibre including in business connectivity markets only. For example, DPA will allow CPs to deploy leased lines more quickly, with less risk, and at a significantly lower cost than otherwise by removing the need to build physical infrastructure. DPA will also allow CPs to control the provisioning process for their customers, which will foster greater non-price competition.

43 For these reasons, DPA can be expected to make it more attractive for CPs to develop their own fibre networks to serve leased lined customers, rather than relying on Openreach Ethernet products. DPA is likely to be particularly attractive in the following instances:

- Where CPs wish to aggregate multiple business connectivity circuits in an area (e.g. using DPA to run a single cable with multiple fibres into a business park to connect several customers).
- Where firms, such as SSE Enterprise Telecoms, City Fibre or Virgin Media, use DPA to aggregate demand from multiple CPs to improve the economics of own network build (in addition to using their own duct).
- As part of a widespread strategic multi-service deployment across a specific part of the country (i.e. rolling out a fibre network across a particular area to provide both broadband and business connectivity).
- To make specific deployments to individual customers, particularly for more valuable VHB circuits (we note that with UDPA this need not be part of a wider mixed-usage deployment).[35]

44 [✂]

Improved DPA will be available for the entire BCMR 2019 review period

45 CPs have been able to use MUDPA to deploy fibre for non-broadband connections since May 2018, and as noted below, further important improvements to MUDPA will be available from April 2019. This improved DPA product will therefore be available to CPs for the entire BCMR 2019 review period.

46 Furthermore, Ofcom expects that the introduction of UDPA would lead to minimal disruption for BT and industry[36] and consequently only requires a short implementation period.[37] Accordingly,

35 This does not require that customer to be an anchor tenant for a wider strategic deployment.

36 We understand that under Ofcom's current proposals UDPA will be, from a product description, process and pricing perspective, essentially the same as MUDPA, but with no requirement for CPs to use BT's PIA product primarily to provide broadband services.

37 See PIMR 2019 para. 5.13.

we expect that rival operators will be able to use BT's PIA product with full flexibility shortly after the start of the BCMR 2019 review period.

47 CPs will need to complete Openreach's Customer Establishment Process to use MUDPA and UDPA. However, we understand that this will not change for the improved DPA products and CPs can complete the process before they become available. At December 2018, [✂] have been established to use BT's DPA products meaning they can place live orders. A further [✂] CPs ([✂]) are in the process of becoming 'established'.

The enhancements to DPA address the main historic limitations of PIA

48 Ofcom required Openreach to make several improvements to its existing PIA product in the WLAMR 2018 that aim to increase CPs' incentives to use PIA:

- **Relaxation of usage restrictions**: Ofcom relaxed the PIA usage restriction in the WLAMR 2018 to allow 'mixed-usage'. This gives CPs greater flexibility to use PIA to deploy local access networks that offer non-broadband services, providing the primary purpose of the network is broadband services.[38]

- **Significant reduction in charges**: Ofcom introduced a cap on PIA rental charges, alongside some important changes to the treatment of PIA costs that resulted in a significant reduction in rental.[39]

- **Enhancements to the product and processes:** Ofcom required Openreach to make several important changes to improve PIA products and processes, including: measures to ensure that CPs can access PIA on equivalent terms to BT downstream; access to digital maps to support network planning; and publication of a PIA Reference Offer.

49 Some of these improvements are already in place, including the pricing changes. The remaining changes which are required under the SMP remedies imposed by WLAMR 2018 will be implemented by 1 April 2019.

50 Ofcom has had a key role ensuring these changes are implemented including via hosting the Duct and Pole Implementation Progress Meetings which are also chaired by Ofcom's CEO. These meetings include the CEOs of Openreach, BT Enterprise and several CPs including Hyperoptic, TalkTalk, CityFibre, Virgin Media and Vodafone.

51 As set out above, UDPA will further improve the PIA product by allowing CPs to use it without usage restriction. Ofcom recognises that the removal of the usage restriction will increase CPs' incentive to use PIA and hence increase the likely impact of the DPA remedy:

> *"Limiting the scope of the PIA remedy is likely to materially increase the risk that a telecoms provider may take the view that it is not viable to invest in the first place… [t]he commercial*

38 PIA was first introduced as a remedy in the 2010 Wholesale Local Access Market Review. In its original guise PIA could be used by CPs to deploy local access networks offering broadband services but not to offer non-broadband services and take-up was very limited.

39 For example, the costs of making existing infrastructure ready for use are to be recovered from all users, up to a limit of £4,750 per km, with other ancillary charges cost-based.

business case for the initial investment therefore typically relies on using this capacity to generate as many different revenue streams as possible".[40]

DPA enables CPs to deploy more rapidly

52 DPA will allow CPs to deploy their own fibre faster than if they need to build their own ducts and other physical infrastructure.[41] Building physical infrastructure will generally result in slower roll-out compared to DPA since it involves more extensive survey and planning work, requires more extensive wayleaves and other permissions (e.g. road closures), and involves time-consuming construction work to create and install the necessary civil infrastructure. This benefit of DPA is recognised by Ofcom in the WLAMR 2018:

> *"By opening up BT's ducts and poles to enable rival operators to install their own fibre … networks can also be deployed much more quickly. For example, while it can take days to build 200 metres of duct using traditional construction methods, fibre cables can be installed in the same length of existing duct in a matter of hours."*[42]

53 In addition, the speed of fibre deployment using DPA is largely in a CP's own control, provided it has completed Openreach's Customer Establishment Process.[43] We understand that a CP is required to submit an order, known as a 'Notice of Intent', which Openreach checks and confirms. Once this is done the CP is responsible for undertaking surveys, planning and deploying their infrastructure. In most cases, the CP can determine how quickly these activities are completed, and Openreach has no significant involvement at this stage, provided no network adjustments are needed to ensure that BT's physical infrastructure is ready for use.

DPA allows CPs to better control the customer experience

54 CPs that use DPA are not reliant on Openreach to make the physical infrastructure connections to customer premises or to provision equipment. This allows CPs to better control the end-to-end customer experience compared to Openreach's wholesale Ethernet services and, therefore, provides CPs with opportunities to compete on further non-price grounds.

DPA significantly reduces own-fibre deployment costs

55 The costs of installing duct and related physical infrastructure typically represent a large proportion of the upfront costs of fibre deployments incurred by CPs. By allowing CPs to deploy fibre without building infrastructure, DPA will significantly reduce the cost of own-fibre deployments. This is recognised by Ofcom in the WLAMR 2018:

> *"By opening up BT's ducts and poles to enable rival operators to install their own fibre networks, we estimate that the up-front costs of building fibre networks could be reduced*

40 See PIMR 2019, para. 5.22.

41 Deployment based on PIA can be relatively fast once a CP has determined where it wants to deploy, since the main activities are to carry out local survey work, establish a physical connection to Openreach's duct network from its own network (if this has not been done already), blow fibre and (if required) tubing, and install equipment.

42 See WLAMR 2018, para. 1.7.

43 See Openreach's *Duct & Pole Access Physical Infrastructure Access (PIA) Product Description: Draft Reference Offer*, November 2018.

by around 50%... Effective access to existing ducts and poles can transform the business case for investing in full-fibre networks."[44]

"Our DPA remedy could transform the business case for companies investing in fibre – lowering the upfront cost by around 50% and reducing the time to market, leading to greater investment in alternative networks in the future."[45]

56 The importance of physical infrastructure costs in the total cost of self-build depends on the distance over which infrastructure is deployed. The economic dig distance model used by Ofcom in the BCMR 2019 implies that the cost of deploying new duct can be materially greater than 50% for leased lines. To illustrate, Ofcom's model indicates that the cost of providing a 1Gbit/s circuit which requires 100 metres of new duct construction is £11,000 in present value terms over five years, but only £2,300 if the duct is already in place.[46]

57 Our analysis of Ofcom's dig distance model, which we have adjusted to incorporate DPA,[47] suggests that if CPs were to use DPA instead of establishing their own duct infrastructure, the discounted cost of the 1Gbit/s circuit over 5 years would be around £3,200. This is clearly a considerable saving on the £11,000 required to self-build the physical infrastructure.

DPA significantly reduces the risks of own-fibre deployment

58 Constructing physical infrastructure assets involves large up-front sunk investments that can only be recovered over long periods. While CPs can sometimes achieve longer minimum contract terms for certain retail business connectivity services (e.g. to provide backhaul from mobile cell sites), for most retail leased lines the typical minimum contract term is 5 years or less[48]. Such contract lengths are unlikely to be sufficient to fully recover infrastructure costs.

59 CPs therefore face a risk of non-recovery, particularly where competition from rivals using Openreach's Ethernet portfolio products limits the scope for accelerated recovery of the duct costs. DPA lowers this risk by reducing the extent to which CPs must make up-front investments. Although we understand that PIA requires a minimum commitment from CPs of 5 years for certain products (e.g. spine duct), this is generally a smaller outlay than would be required with self-build, and better reflects the likelihood of cost recovery at the retail level.

44 See WLAMR 2018, para. 1.7.

45 See WLAMR 2018, para. 1.28.

46 These figures are based on Scenarios 3 and 2b respectively in Ofcom's model.

47 The assumptions we have made to adapt Ofcom's model are set out in Annex A1. The PIA cost estimate is discounted using the same approach and assumptions used by Ofcom for considering the on-going rental charges for EAD LA. As we set out in Annex A1, we have adopted a highly conservative approach to incorporating DPA into Ofcom's modelling.

48 For example, see Figure 8.1 of the *Business Connectivity Services Review*, May 2015 produced by BRDC for Ofcom (https://www.ofcom.org.uk/__data/assets/pdf_file/0026/57491/bcmr_2014_report-bdrc.pdf) or paragraph 2.6 of *Business Connectivity Market Assessment*, March 2018 produced by Cartesian for Ofcom (https://www.ofcom.org.uk/__data/assets/pdf_file/0009/113112/cartesian-business-connectivity-market-assessment.pdf).

DPA will materially increase the competitive constraints on BT in some areas

60 DPA will increase the scope for CPs to profitably deploy fibre networks to provide leased line services. As set out above, CPs are likely to use DPA in a variety of ways, including:

- **Tactical** deployments of individual leased line circuits to particular customer sites, or to aggregate multiple business connectivity circuits in an area (e.g. to run a single cable with multiple fibres into a business park to connect several customers, or to provide backhaul to multiple cell sites on a route). The proposed UDPA remedy will facilitate this by removing the usage restriction that only allows DPA to be used to provide leased line circuits as part of a wider mixed-usage deployment. [✂]

- As part of a more **strategic** multi-service deployment (e.g. comprising broadband and non-broadband services) to a broader region or area. DPA is likely to be particularly attractive for this type of deployment since it will allow CPs to benefit from economies of density and scope. Multi-service operators may, for example, seek to secure one or more 'anchor tenants', such as a local council, or a business park, or indeed a mobile operator and then build out a wider network using DPA.[49]

61 In the tactical deployment use case, a CP will consider the least-cost way of providing the required service when responding to a customer's tender. Absent DPA, the CP will face a choice between purchasing an Openreach wholesale Ethernet service or self-supply using its own physical infrastructure.[50] In general, the self-build option will make economic sense only for higher value and shorter connections. Historically, this is the key reason why CPs have relied on BT's Ethernet services in many circumstances. By reducing the cost and risk of network extensions DPA will make it economic for CPs to carry out network extensions over longer distances in a wider range of circumstances. This will increase the incentive for a CP to deploy its own network and allow it to bid more competitively in tenders for business connectivity services.

62 The incentive to use DPA may be particularly strong in some strategic deployment use cases, given the potential to capture economies of scale and scope that would not be possible using Openreach's wholesale Ethernet products.

Illustrating the impact of DPA on deployment costs

63 The potential for DPA to reduce CPs' deployment costs in the tactical use case can be illustrated by comparing the total cost of ownership ('TCO') of a circuit provided using Openreach's Ethernet products to the TCO using DPA. We have derived TCO estimates for these options using an amended version of Ofcom's economic dig distance model that incorporates the cost of

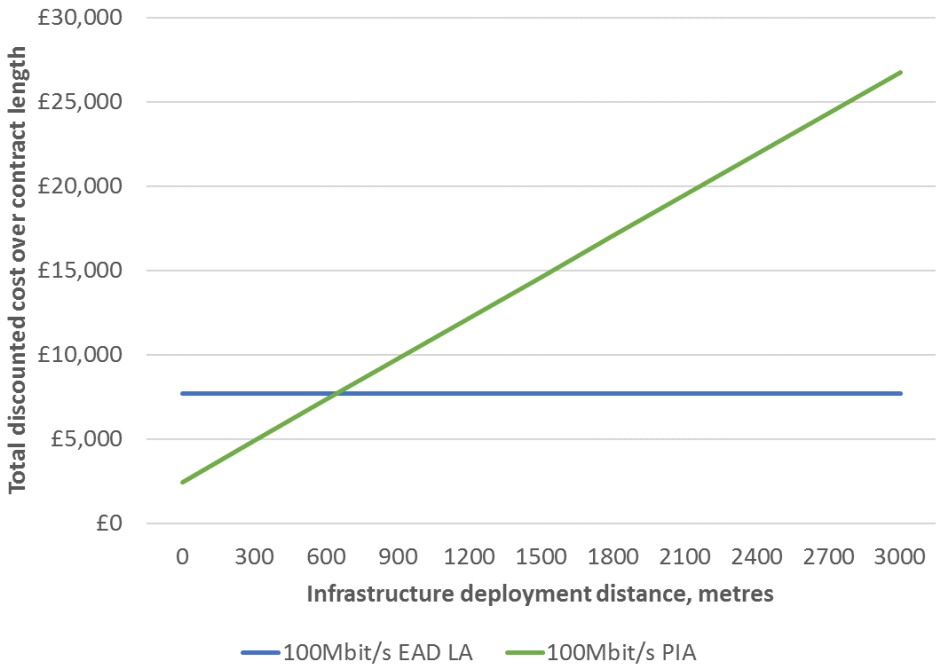
[49] There are various potential models for doing this. For example, we understand that SSE Enterprise Telecoms is working with both Three UK and Telefonica UK to aggregate their backhaul demand.

[50] Third-party wholesale services are a potential third option, where available.

deployment using PIA (see Annex A1 for details).[51] Based on this, we can assess the least-cost option in relation to individual circuits of different bandwidths, given the deployment distance.[52]

64 Figures 2 to 4 below show the five-year TCOs for 100Mbit/s, 1Gbit/s and 10Gbit/s circuits respectively. The analysis compares purchasing an Openreach EAD LA[53] to own-fibre deployment using DPA to assess the breakeven distance (i.e. the maximum route distance over which DPA is least cost option). As we set out in Annex A1, our analysis uses a conservative set of DPA assumptions.[54] A less conservative approach would result in longer breakeven distances.

Figure 2: Five-year total cost of ownership, 100Mbit/s EAD LA versus own-fibre deployment using DPA (PIA)



Source: AlixPartners

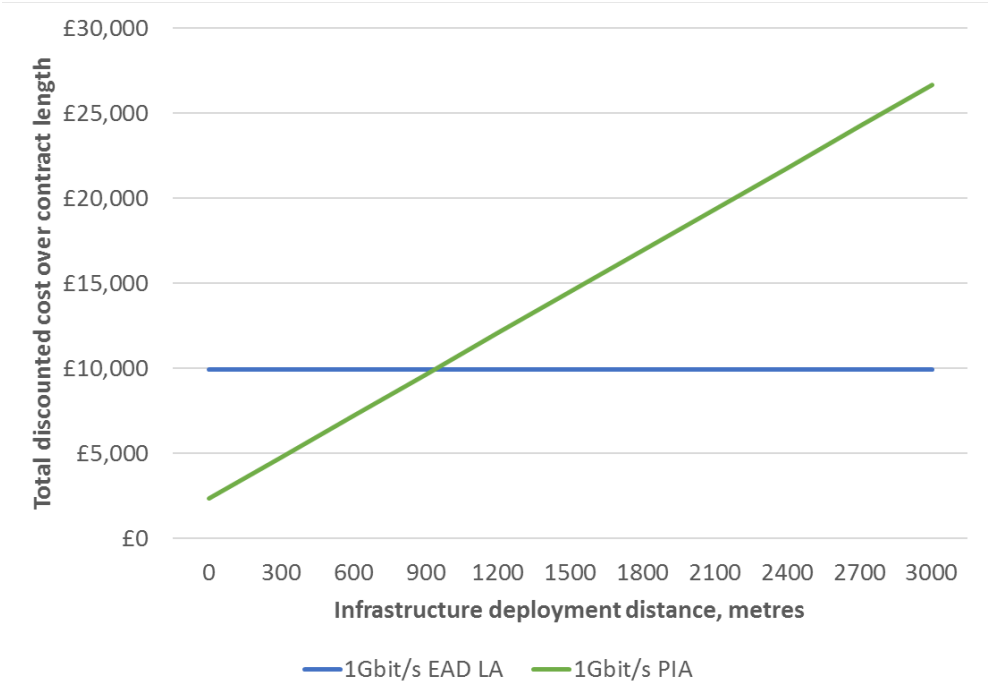
51 Our use of Ofcom's economic dig distance model should not be interpreted as our agreement with all aspects of Ofcom's calculations. Rather, it provides a practical method to illustrate the order of magnitude of the impact of including DPA into Ofcom's framework.

52 The distances in this analysis refer to route distance rather than the (shorter) radial distance used to calculate network reach in Ofcom's geographic market analysis. Route distance is appropriate here as it relevant measure of the resources used by a CP in providing a connection using DPA.

53 The focus on EAD LA is consistent with Ofcom's approach. EAD circuits are typically more expensive (for a given bandwidth). Therefore, we would expect the breakeven distance to be longer for EAD, all else being equal.

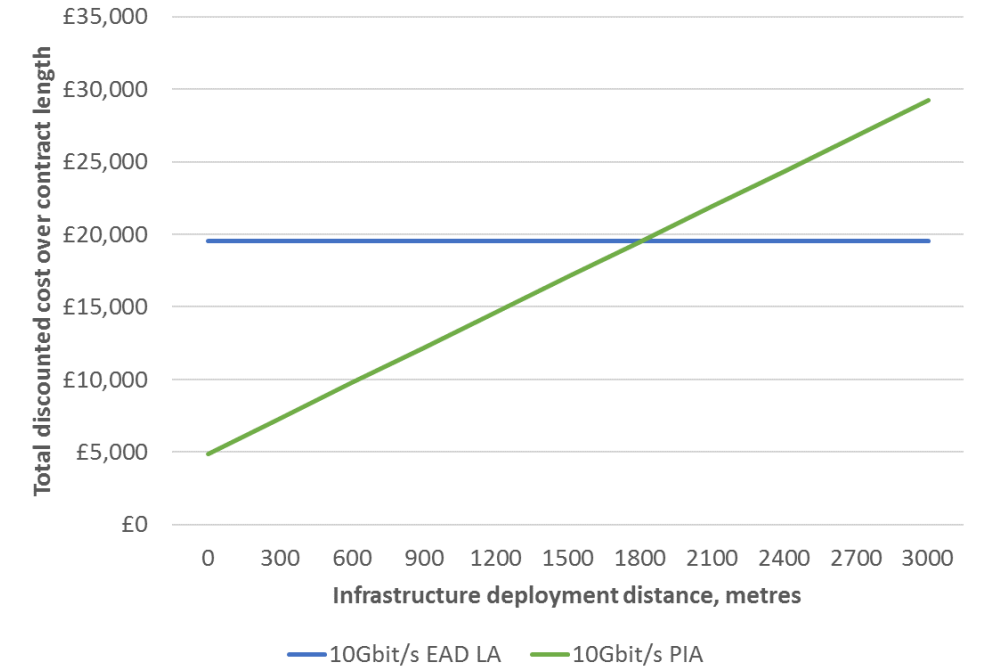
54 For example, assuming all duct is single bore (i.e. the most expensive form of duct) and including charges for blockage clearance which we understand will typically not apply in the revised network adjustments regime that will come into force in April 2019.

Figure 3: Five-year total cost of ownership, 1Gbit/s EAD LA versus own-fibre deployment using DPA (PIA)



Source: AlixPartners

Figure 4: Five-year total cost of ownership, 10Gbit/s EAD LA versus own-fibre deployment using DPA (PIA)



Source: AlixPartners

65 The analysis suggests that DPA will result in significant cost savings which will incentivise CPs to switch to DPA, particularly for shorter, higher bandwidth circuits. In particular, the analysis suggests that for extensions up to c.650m for 100Mbit/s, c.940m for 1Gbit/s, and c.1810m for

10Gbit/s circuits it is cheaper for CPs to extend their own networks using DPA rather than using an Openreach EAD LA circuit.[55]

66 The incentive to use DPA will be greatest when CPs are supplying a customer site for the first time and hence must pay the upfront costs associated with an Openreach Ethernet service connection charge. However, CPs may also seek to migrate customers who they currently supply using an Openreach EAD or EAD LA connection if this is expected to result in sufficient cost savings over the remainder of the customer lifetime.[56]

67 Given this profit incentive we would expect such deployments to happen rapidly and within the timeframe of the BCMR 2019 review period.[57] However, unlike Ofcom, we do not have access to detailed data on the location of CP networks. Therefore, we are unable to estimate what proportion of Openreach wholesale Ethernet circuits could be vulnerable to DPA substitution given such breakeven distances. However, the analysis set out in the next section implies it could be material.

55 These figures refer to route distance, not radial distance.

56 Moreover, CPs may see advantages in switching existing customers to DPA mid-contract to better enable them to compete for future contract renewals.

57 We note that the incentive and ability to use DPA will depend on whether there is sufficient duct space available, and on the prevalence of duct blockages. Ofcom has previously found that 63% of 90mm duct ends and 97% of 50mm duct ends surveyed in 2010 had at least 42% of unoccupied space (Ofcom, 2016. *Making communications work for everyone: initial conclusions from the Strategic Review of Digital Communications*, para. 4.27). Although BT stated that not all of this duct will be usable, this suggests that any restrictions on the usage of DPA are more likely to be localised rather than general. We note that Ofcom does not identify duct availability as a key constraint in its market analysis in BCMR 2019.

4 DPA has significant implications for the BCMR 2019 market analysis

Introduction

68 For the reasons set out in Section 3, DPA will materially increase CPs' ability and incentive to deploy their own fibre networks in the BCMR 2019 review period. As we have shown above, DPA will increase the scope for profitable fibre deployments by making it more economic for CPs to deploy networks over longer distances and in more areas that would otherwise be possible if they had to invest in physical infrastructure. This will result in an increase the number of CPs capable of serving business sites within given areas, including in the HNR Metro areas identified by Ofcom.

69 Given the profit incentive for CPs to switch to DPA, we would expect such deployments to happen rapidly, particularly for shorter and higher bandwidth circuits. Accordingly, we expect that DPA will result in an increase in network competition in some areas and the erosion of BT's market power during the BCMR 2019 review period. This is likely to affect competitive conditions in mixed deployments of FTTP using DPA, as well as in deployments of high capacity leased line connections. For example:

- By allowing CPs to provide connections more cheaply and easily than otherwise, DPA will increase the competitive pressure on Openreach's wholesale Ethernet products.
- Moreover, as explained further below, BT can be expected to take the potential competition due to DPA into account which will ensure that it offers competitive terms and conditions for its Ethernet services (and its retail business connectivity products).

70 The increase in network competition due to DPA has important potential implications for Ofcom's market analysis and remedy design in the BCMR 2019 which we discuss below.

Geographic market definition

71 We focus on the impact of DPA on geographic market definition since the extent to which DPA results in network deployment by CPs is likely to vary geographically. We note that DPA may also have consequences for product market definition, for example, because CPs may have a particularly high incentive to use DPA in tactical deployments to provide high value VHB circuits.

CI access service market

72 Ofcom's analysis of geographic markets for CI access services is based on an analysis of the proximity of business locations to CP networks (including BT's network). This analysis is sensitive to the buffer distance that is used to define network reach, as Ofcom acknowledges:

> *"The analysis shows that the geographic definition is sensitive to the choice of buffer distance used and that a wider buffer distance would result in us defining larger areas as having HNR […] This result is to be expected as increasing the buffer distance means that more distant networks will be identified as sufficiently proximate to the customer. This will*

increase the proportion of customers with higher network reach in any given postcode sector."[58]

73 Ofcom assumes a buffer distance of 50m, based on its analysis of the economic dig distance. This analysis compares the cost to a CP of providing individual business connectivity circuits using Openreach's Ethernet products (i.e. EAD LA) versus an extension of its own network.[59] Ofcom cross-checks its dig distance findings against evidence of actual dig distances by CPs and notes that:

> *"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."*[60]

74 The observed actual dig distances relate to a period in which CPs were not able to use DPA to provide leased lines and hence reflect the impact of the high cost of network extensions that involve the construction of physical infrastructure. These are not relevant when considering operators' willingness to deploy fibre using DPA, since this does not involve duct work. Furthermore, as explained above, fibre deployment via DPA is likely to be faster than self-build without DPA and is also largely within a CP's control.

75 We have analysed the potential impact of DPA on the distance over which it is economic for a CP to extend its network to connect a new customer site using Ofcom's economic model of dig distance which we have adjusted to include DPA.[61] Our approach has been to make only those changes to Ofcom's model that are necessary to illustrate the impact of consuming DPA from Openreach on a CP's cost stack.[62]

76 Ofcom's economic dig distance model considers three different network deployment scenarios:

- **Network extension**: where a CP needs to deploy new duct and fibre.
- **Duct connected without tubing**: the CP does not need to deploy new duct but does need to deploy tubing and blow fibre.
- **Duct connected with tubing**: the CP only needs to blow the fibre.

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58 See BCMR 2019, para 13.11 and 13.12.

59 In para. 5.17 Ofcom sets out that "*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 accessing supply-side substitution in Section 4 and is presented in more detail in Annex 10.*" Annex 10 is titled 'Economic dig distance and cost analysis'.

60 BCMR 2019, para. 5.19.

61 We note that the published version of the economic dig distance model produces results that are slightly different to those presented in Table A10.6. It is not clear to us what drives this difference. The results we present in this section are based on the Excel model released by Ofcom.

62 Only making the minimum necessary changes to Ofcom's model should not interpreted as our agreement with all aspects of Ofcom's calculation. Rather it is intended to maintain consistency with Ofcom's existing approach.

77 Our analysis of the impact of DPA on CP deployment distances considers the scenario where the required duct is connected but without tubing or fibre. We have adjusted the inputs in Ofcom's model to include the cost to the CP relating to Openreach's PIA charges. Our analysis therefore assumes the CP will need to deploy tubing, blow fibre, provide the electronics, but will rent duct access using PIA. We explain our adjustments to Ofcom's modelling in Annex A1.

78 Table 1 shows the estimated dig distance using DPA alongside Ofcom's estimated dig distances for self-build. In Table A10.6 of the BCMR 2019 consultation Ofcom only reports the results for three and five-year payback periods. However, its model also produces results for a seven-year period. Given that we understand that longer minimum contract terms can particularly arise in relation to VHB circuits used for backhaul, for example, we have also presented the results for a seven-year payback period.

Table 1: Comparison of economic radial[63] network extension distances based on own-duct deployment and use of DPA, metres

	Network extension (new duct required)	Network extension (using DPA)
Three-year payback		
EAD LA 100Mbit/s	27	284
EAD LA 1Gbit/s	43	433
EAD LA 10Gbit/s	105	1,069
Five-year payback		
EAD LA 100Mbit/s	47	463
EAD LA 1Gbit/s	69	670
EAD LA 10Gbit/s	129	1,292
Seven-year payback		
EAD LA 100Mbit/s	63	575
EAD LA 1Gbit/s[64]	97	934
EAD LA 10Gbit/s	165	1,590

Source: AlixPartners

79 This analysis shows that:

- DPA allows CPs to economically address demand 10 times further away from their existing networks than own-build network extensions.

63 Radial distances are calculated using the same route-to-radial conversion factor (i.e. 1.4) assumed by Ofcom. We are not in a position to assess the validity of this assumption or whether an alternative would be more appropriate in these circumstances with the information available to us.

64 Ofcom's modelling uses Openreach's 84-month term discount charges for 1Gbit/s circuits in the seven-year payback scenario. These charges are, in fact, higher than the 60-month term discount charges. Therefore, in practice CPs are unlikely to sign up to the 84-month term discounts – they are more likely to use the 60-month term discount charges for all retail circuits sold for 5 years or longer. Given this, the breakeven distances estimated for 1Gbit/s over a seven-year payback are conservative in this respect.

- DPA enables CPs to provide their own fibre connections to end users cheaper than even the cheapest Openreach wholesale Ethernet services (100Mbit/s EAD LA services) for distances up to just under 300m even based on just a three-year payback period.

- For higher bandwidth services, particularly over longer contract terms, DPA allows cheaper deployment for even greater distances (i.e. up to c.1.6km using a seven-year payback period).

80 These results indicate that DPA will increase the economic network extension distances far beyond the 50m buffer distance assumed by Ofcom. This clearly illustrates the potential for DPA to allow CPs to profitably supply individual leased lines by extending their networks over much greater distances. As explained in Section 3, DPA is likely to have an even greater impact where it is used by CPs to aggregate multiple business connectivity circuits in an area, or as part of a strategic multi-service deployment to a broader region or area. In both cases the CP would benefit from the economies of density and scope that arise with such deployments using DPA.

81 We do not have access to the detailed information on CP network locations that Ofcom has used for its geographic analysis. As a result, we are unable to model the impact of a more appropriate buffer distance assumption on competitive conditions at the postcode sector level. However, the sensitivity analysis undertaken by Ofcom shows that increasing the buffer distance from 50m to 100m, the number of postcode sectors classified as 'high network reach' ('HNR') more than doubles from 576 to 1,261.[65] Furthermore, the number of postcode sectors categorised as 'BT Only' falls by over 20%.

82 Our analysis suggests that a 100m buffer distance would still be highly conservative, and that a distance of at least 300m would be more appropriate. While we are not able to assess how this would affect the classification of postcode sectors, appropriate consideration of DPA would likely result in many more postcode sectors that are currently considered to be BT-only or BT+1 in the BCMR 2019 consultation being more appropriately reclassified as HNR areas, given the greater expected presence of rival networks in the market review period.

CI inter-exchange market

83 DPA is also relevant to the CI inter-exchange market since it will reduce the costs for CPs of establishing a presence at BT exchanges. We note that the prevalence of VHB circuits is likely to be higher in this market since CPs typically require considerably higher bandwidth for exchange connectivity. This is important as CPs will find it economic to deploy their own fibre over much longer distances for VHB connections. To illustrate, our amended version of Ofcom's economic dig distance model implies that it is more profitable for a CP to use DPA rather than EAD LA 10 Gbit/s for circuits up to c.1.6km.[66]

84 Ofcom's quantitative analysis of the inter-exchange market is more limited than for the CI Access market which limits our ability to assess the precise impact of DPA on the CI Inter-Exchange market definition. In particular, Ofcom only provides information on measures of the average distance[67] between BT exchanges and the 1st and 2nd closest rivals.

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65 As set out in Table A13.1 of the BCMR 2019 consultation. We assume the network coverage threshold remains unchanged at 65%.

66 This is based on a 7-year economic life since CPs are likely to consider longer time horizons for exchange connectivity than customer-specific deployments.

67 Measured by the mean and median distance.

- For 'BT Only' exchanges, Ofcom's estimates of the average distance to rivals is substantial at more than 6km. While this is considerably longer than the c.1.6km figure given above, there is likely to be considerable variation around this average. Given the potential for CPs to build out to an exchange on an individual exchange basis, it is therefore important to consider the impact of DPA on network deployment on an individual exchange basis. However, Ofcom does not appear to have carried out such a disaggregated analysis. Appropriately done, this may indicate that DPA will enable multiple CPs to deploy their own fibre to some of the BT-only exchanges (particularly where a CP has multiple VHB circuits connected to the exchange).

- For 'BT+1' exchanges, Ofcom estimates the median distance to the 2nd closest rival is considerably shorter at 319m. This is well within the DPA economic network extension distances reported in Table 1 above for all 1Gbit/s and 10Gbit/s scenarios considered. Furthermore, Ofcom's estimate of the average distance to the 2nd closest rival of 1,531m is within the DPA economic distance for a 7-year 10Gbit/s circuit (i.e. 1.6km).[68]

85 This analysis suggests that Ofcom has understated the likely proportion of BT+2 or more and BT+1 exchanges over the BCMR 2019 period.

SMP analysis

86 DPA is also likely to have implications for Ofcom's SMP analysis in both the CI access services market and the CI inter-exchange connectivity market.

CI access services market

87 Ofcom's SMP assessment is, in large part, predicated on BT's control of its duct and pole network. As we have explained, DPA allows BT's downstream rivals equivalent access to its duct and pole network, ensuring that the competitive advantages that BT has historically derived will be available to all CPs.

88 BT's historically high market/service shares in certain business connectivity markets will reflect this advantage since neither the enhancements to the existing DPA product nor the proposed UDPA changes were available in the period covered by Ofcom's market share analysis. These enhancements to DPA will increase the contestability of leased lines in the BCMR 2019 review period, particularly in HNR areas, gradually eroding BT's market/service share over time. Accordingly, BT's current market/service shares are likely to overstate BT's actual market power in the CI access services market.

89 These considerations imply that Ofcom should reconsider its SMP findings, taking DPA into account. Furthermore, Ofcom should place greater weight on the competitive impact of DPA on actual and potential network competition[69] in the review period, with less importance attached to historic market/service shares:

- **Increased actual network competition:** network deployment by CPs using DPA in the review period will increase network presence in BT only and BT+1 postcode sectors. If this is on a sufficient scale to meet the 65% network threshold this will result in some BT only areas

[68] We note that the sizeable difference between the median and average distances in Table A12.19 is indicative of the wide distribution of distances we would expect to observe.

[69] In appropriately defined geographic areas where it finds competitive conditions to be sufficiently homogeneous, see paragraph 351 of the Competition Appeals Tribunal judgement in Case No. 1260/3/3/16.

becoming BT+1 and potentially HNR areas, and some BT+1 areas becoming HNR areas. Similarly, increased network deployment using DPA in BT+2 areas may increase the competitive constraint on BT sufficiently to result in an absence of SMP in some of the HNR Metro and other HNR areas.

- **Stronger potential competition:** for similar reasons, DPA will also strengthen the competitive constraints from potential or likely future network presence. This can be expected to arise in two ways. First, DPA will lead to a sustained reduction in the cost of own-fibre deployment for CPs. As set out above, this increases the likelihood of CPs using DPA (in combination with their own or third-party fibre) rather than Openreach's wholesale Ethernet services (all else being equal). Openreach will be cognisant of this increased threat of switching, which will directly constrain its terms and conditions for its Ethernet services. Second, Openreach can be expected to face an indirect constraint from competition downstream. If it expects its Ethernet customers (i.e. CPs) to face greater retail competition from rivals bidding for contracts based on using lower cost DPA-based services, this will also act as a constraint on Openreach's Ethernet terms and conditions. Neither the direct nor indirect constraints rely on CPs currently using DPA, or in the case of indirect constraints, bidding being based on using DPA. Rather, they rely on Openreach considering the use of DPA by rival CPs to be sufficiently credible. For the reasons we have set out in this report, CPs are likely to have both the ability and incentive to quickly take-up DPA (i.e. within the BCMR 2019 review period).

90 In our judgement, if Ofcom was to place greater weight on the competitive impact of DPA over the review period it would likely find materially more areas will tend towards being effectively competitive over the review period. This is particularly the case in HNR Metro and other HNR areas where CPs already have a material degree of network presence which is located closer to customer sites.

91 Ofcom considers that:

> *"There are no prospects of potential competition that can effectively constrain BT in BT-Only and BT+1 geographic markets by 2021. This is already reflected in the limited availability of existing rival infrastructure."*[70]

92 Ofcom explains that most of the responses from telecom providers indicate that their network extension plans are on a very small scale or related to core networks, and also that any use of duct access is unlikely to be widespread in the review period.[71] However, the significance of operators' stated network investment plans for Ofcom's competition analysis depends upon the extent to which they actually took the planned introduction of the DPA remedy into account.

93 It would not be surprising if CPs' investment plans previously shared with Ofcom did not incorporate the use of DPA. CPs may not reflect regulatory remedies into their network plans until the introduction of such remedies, and the terms upon which they will be based, are sufficiently clear. The Reference Offer for MUDPA is still to be finalised. Furthermore, Ofcom's detailed UDPA proposals were only published (in the PIMR) alongside the BCMR 2019 consultation. Therefore, Ofcom's specific UDPA intentions may not have been sufficiently clear to CPs for them to be reflected in their formal network plans when they were requested by Ofcom. If CPs' plans have

70 BCMR 2019, para. 6.70.

71 BCMR 2019, para. 6.71 to 6.73.

not factored in the possibilities enabled by DPA, they cannot be used as evidence that DPA "*is unlikely to be in widespread use*" in the review period and "*therefore unlikely to lead to effective competition by 2021*".[72] In practice, CPs may focus on identifying where there are profitable opportunities to flex or adapt investment plans using DPA. Given this, Ofcom should ask CPs to provide sensitivity or scenario analysis carried out to explore potential uses of DPA, as well as the results of any DPA pilot studies undertaken.

94 A further consideration is that because retail business connectivity contracts typically last for longer than a year (often up to 5 years, and potentially longer in relation to anchor tenants or VHB customers) only a proportion of circuits are tendered in each year. As a result, the immediate impact of DPA in terms of lowering deployment costs for BT's rivals will only result in observable changes in market shares and network presence that develop progressively over time as CPs use DPA to address new customer demand as it arises. This means that changes in market shares and network presence can be expected to be a lagged indicator of the increase in competition that will arise throughout the review period due to the introduction of DPA. In addition, the potential change in market shares over the review period will be naturally limited by the importance of multi-year contracts in business connectivity markets (e.g. a 3-year contract from 2018-21 will not be contestable within the review period).

95 DPA can be expected to result in increased potential competition within the review period if Openreach considers it sufficiently likely that competition from CPs using DPA will arise, as set out above. This competitive constraint will result in downward pressure on BT's prices which will be observable in advance of changes in market shares and network presence.

CI inter-exchange services market

96 As noted earlier, our analysis of deployment distances using DPA indicates that CPs could profitably extend their network over longer distances than those considered by Ofcom based on self-build costs. This should be fully considered on an individual exchange basis. This is likely to show that more BT-only and BT+1 exchanges are prospectively competitive over the review period and hence should not be found to have SMP.

Remedy design

97 Ex ante remedies should only be applied in markets where BT has SMP. In addition, remedy design should be sensitive to the degree to which BT has SMP to ensure that remedies are proportionate to the potential competitive concern, taking account of the risk that regulation may itself undermine the scope for network investment and competition. The importance of designing regulation to incentivise investment in potentially competitive areas is clearly recognised by Ofcom:

> *"In potentially competitive areas, we want to create the best environment to incentivise investment. We would design regulation to encourage network deployment, recognising that competing providers will only invest in building their own networks if this is more attractive than buying wholesale services from BT."*[73]

[72] BCMR 2019, para. 6.74.

[73] Ofcom, 2018. Regulatory certainty to support investment in full-fibre broadband, para.4.15.

98 Ofcom has proposed remedies that vary across the relevant geographic markets for both CI access services and CI inter-exchange connectivity. Ofcom explains that this reflects the variation in network competition and, in the case of HNR Metro and other HNR areas in the CI access services market, the likely availability of DPA during the review period. However, our analysis suggests that Ofcom has not appropriately assessed the potential competitive impact of DPA on the business connectivity markets in the BCMR 2019 review period. This undermines the robustness of Ofcom's proposed market analysis findings, with the risk that the proposed regulatory remedies are incorrectly applied in areas where effective competition either exists now or is likely to emerge during the BCMR 2019 review period.

99 Where Ofcom has taken into account DPA and finds that BT has SMP, it is also important that it considers the increased actual and potential competition enabled by DPA when designing remedies. For example:

- **In HNR Metro areas (and beyond for VHB)**: Ofcom should consider removing the requirement to provide wholesale access in the CI access services market where there is sufficient actual and potential network competition based on DPA. Network investment based on DPA is likely to emerge more rapidly in the HNR Metro areas than elsewhere, since CPs already have material network presence and network deployment distances are typically relatively short.[74] Since DPA will allow CPs to deploy fibre profitably further from their existing networks it is likely to increase their ability to contest a greater proportion of business sites in HNR Metro areas. Moreover, as explained above, by lowering the cost of network extensions DPA will increase the competitive constraint on BT; the greater threat of entry using DPA can be expected to intensify potential competition in advance of further network deployments. For these reasons, DPA is likely to have a particularly significant impact in the HNR Metro areas, with the result that competitive conditions will be more similar to the CLA. Similarly, given the higher value nature of VHB circuits, CPs can be expected to use DPA to deploy fibre profitability further from their existing network, including outside HNR Metro areas.

- **In the other CI access markets:** as set out above, the availability of DPA may mean that for some areas network competition will materially increase during in the review period, but not to the point where Ofcom considers it to be sufficient to alter its SMP finding. In such areas, Ofcom should consider whether it is proportionate to apply more intrusive remedies (e.g. the proposed charge control, minimum quality of service remedies and equality of inputs obligations). The fact that volume or geographic discounts (unlike term discounts) do not count towards charge control compliance reduces Openreach's incentives to lower its wholesale Ethernet prices to win customers in those parts of the country where its costs are lower than average (and to charge more where costs are higher).[75] This restricts Openreach's ability to compete on price and also risks creating an inefficient misalignment of prices and costs distorting CPs' investment incentives. These distortions could result in higher industry costs that are passed on to customers in higher prices, potentially lowering take-up of fibre services.

74 Ofcom's dig distance analysis shows that 80-90% of businesses in the Metro areas have at least two rival networks within 50m (see Table 6.6 of BCMR 2019). Furthermore, in the HNR areas outside the CLA, Ofcom finds that the average distance to the third rival is only 134m, while the for the fourth it is 387m (see Table 6.9).

75 See BCMR 2019 volume 2, para. 5.19.

Such outcomes are undesirable and would undermine the policy goal of promoting network competition, deregulation and the development of high speed fibre services in the UK.

- **In the CI inter-exchange market:** Ofcom should reconsider its proposal to require BT to provide dark fibre at BT-only exchanges in this review. Ofcom proposes that BT should be required to provide dark fibre only in areas where it is confident that network competition is unlikely to develop in the medium to long term.[76] We agree that it is appropriate to err on the side of caution in view of the risk that regulated dark fibre will undermine fibre investment. However, as noted above, Ofcom would need to consider the impact of DPA on competitive conditions at individual exchanges to fully understand the potential for investment by CPs. In the absence of such an analysis (and assuming it is possible to conclude with reasonable certainty the DPA would not be sufficiently used), it seems premature to require dark fibre at this stage given the risks to investment.[77]

[76] BCMR 2019, para. 10.15.

[77] Without prejudice to the issues BT Group and Openreach raise in their responses to the PIMR and the BCMR challenging the proportionality of the dark fibre remedy.

A1 Updating Ofcom's economic dig distance model to include DPA

A1.1 Introduction to Ofcom's model

100 One of the key assumptions Ofcom uses in its network reach analysis is the buffer distance. This is the distance Ofcom uses to identify whether rival networks are sufficiently proximate to business locations.[78] Ofcom proposes to assume a buffer distance of 50m.[79]

101 As set out in Section 4, the buffer distance assumption is based on the distance that it could be economic for operators to extend their network to supply a customer. To establish this assumption Ofcom developed an economic dig distance bottom-up model for BCMR 2019. This Excel model is found in Annex 16 of BCMR 2019[80]. An explanation of the spreadsheet, and the results, is set out in Annex 10.

102 The model identifies the furthest distance operators would be willing to deploy their own infrastructure for a single leased line based on Openreach's current Ethernet (i.e. EAD LA) prices. Openreach Ethernet charges do not depend upon distance[81] but several of the costs incurred in own-infrastructure deployment do. Therefore, the model solves for the break-even distances for different circuit bandwidths and contract lengths. The model also considers different deployment scenarios for CPs:

- **Scenario A: Network extension** - where a CP needs to deploy new duct and fibre.
- **Scenario B: connected without tubing** - the CP does not need to deploy new duct but does need to deploy tubing and blow fibre.
- **Scenario C: Duct connected with tubing** - the CP only needs to blow the fibre.

103 The model is bottom-up[82], based on the following activities:[83]

- One-off distance-related passive activities:
  - Blown fibre tubing;
  - Blown fibre;
  - Duct under a footway;
  - Duct under a carriage way;

78 The buffer distance is a radial (i.e. straight line) distance, not the route distance.

79 See BCMR 2019 consultation, paragraph 5.18.

80 We note that the published version of the economic dig distance model produces results that are slightly different to those presented in Annex 10. It is not clear to us what drives this difference.

81 Up to the maximum distances for each product.

82 i.e. it builds up the costs from the individual activities required for each scenario

83 Not all activities are relevant to each scenario. For example, duct costs are not relevant in those scenarios where there is existing duct.

  - Blockage clearance; and
  - New footway boxes.
- One-off distance-independent passive activities:
  - Survey; and
  - Break through external wall(s) at customer premise.
- Active costs:
  - Electronic equipment and installation costs.

104 Ofcom makes some assumptions about the prevalence of these activities for leased lines, including:

- Duct is assumed to be 90% under a footway and 10% under a carriage way;
- A new footway box is required for every 100m of new duct;
- A customer wall break-through is required when there is new duct;
- There are 1.5 blockages per kilometre when tubing is required in existing duct[84]; and
- A survey is required in all scenarios.

105 The unit costs for each of the activities are sourced from BT's Excess Construction Costs ('ECCs') price list[85] except for:

- Blockage clearance costs – sourced from BT's PIA price list; and
- Electronic equipment and installation costs – sourced from BT's 2017/18 RFS information.

106 Costs that are incurred over time are discounted using a discount rate of 9%.

107 The model outputs are based on route distances. These are converted to radial distances using a route-to-radial factor of 1.4.

A1.2 Incorporating DPA into Ofcom's model

108 Ofcom's model only considers CP build-buy decisions based on CPs building their own infrastructure. To illustrate the impact on economic network extension distances of CPs using DPA

84 This is the low case scenario. Ofcom also includes a high case scenario (which is not apparently used) of 2.0 blockages per kilometre.

85 i.e. Ofcom assumes that CP deployment costs are the same as BT's ECC charges.

we have made changes to Ofcom's model. Our approach has been to make only those changes that are necessary to illustrate the impact of consuming DPA on a CP's cost stack.[86]

109 Our analysis is based on the scenario where the required duct is connected, but without tubing or fibre (i.e. Scenario B above). However, we have adjusted the inputs in Ofcom's model to include the cost to the CP relating to Openreach's PIA charges.[87] We therefore assume that the CP will need to deploy tubing, blow fibre, and provide the electronics, but will rent duct access using PIA. Conservatively we assume that the duct access is used for providing a single leased line. As set out above, CPs may be able to use DPA to aggregate circuits thereby benefitting from economies of scale and scope. We do not include any such economies in our analysis.

110 Ofcom's Scenario B cost stack includes items for:

- Survey;
- Blown fibre tubing;
- Blown fibre;
- Blockage clearance; and
- EAD electronics equipment and installation.

111 We retain each of these cost items and Ofcom's assumptions for each.[88] This is likely a conservative assumption for the scenario we are considering; we understand that under the changes to PIA introduced under the WLAMR 2018 MUDPA regime, Openreach will not charge CPs for blockage clearance from April 2019 if the costs of such activities are less than the £4,750 per km network adjustment limit set by Ofcom.

112 To reflect a CP using BT's PIA product rather than their own duct we have included the following additional items in the cost stack:

- **Lead-in duct**: although not used in its calculation, Ofcom's model contains an assumed lead-in length of 25m. We have used this assumed distance and applied the rate of 55p per metre per year (i.e. the highest lead-in rate) from BT's PIA price list[89].

86 Only making the minimum necessary changes to Ofcom's model should not interpreted as our agreement with all aspects of Ofcom's calculations. We have not subjected the model to a detailed methodology or input review. Rather our use of Ofcom's model is intended to illustrate the impact of taking DPA into account in a manner that maintains consistency with Ofcom's existing approach.

87 Consistent with Ofcom's approach (and therefore the prices for other services contained within the modelling) we have used the charges currently in force. However, these may be subject to change prior to the review period.

88 We also retain Ofcom's assumptions in relation the pricing of Openreach's wholesale Ethernet services. As such, for a seven-year circuits we use the Openreach 84-month term discount charges. These charges are higher than the 60-month term discount charges. In practice it is therefore unlikely that CPs will take out the 84-month term discount products. Rather CPs are likely to use the 60-month term discount product for all retail circuits sold for 5 years or longer. The use of the 84-month term discount charges is therefore conservative.

89 Although largely unused all the relevant PIA price lists are included in Ofcom's model.

- **Spine duct**: we assume that all duct that is not lead-in duct is single bore. We therefore, conservatively[90], apply the rate of 28p per metre per year from the PIA price list.

- **Joint box facility hosting**: we assume 32 joint boxes per kilometre[91] and a rate of £2.01 per box per year from the PIA price list. We understand that for every joint box there will be a charge into the box and out of the box, therefore the effective charge is £4.02 per box.

- **Distribution joint hosting**: we assume one distribution point (i.e. 'Customer Apparatus In-line Splice hosting and distribution joints') per circuit at the rate of £18.11 per year from the PIA price list.

- **Joint box breakthrough**: we assume that the CP will need to breakthrough from its duct into BT's duct. We use the 'Joint box breakthrough' charge (£566.35) on the PIA price list as a proxy for this cost.

113 We understand that Openreach currently has a minimum term for spine duct rental of five years, although the minimum term for other PIA products can be less. Conservatively, we assume that all PIA charges have a minimum five-year term and therefore include a minimum five years of PIA charges in our analysis.[92]

114 We treat each of these costs in an equivalent manner to Ofcom's original model. Therefore, costs that occur over time are discounted using the same discount rate used by Ofcom.

90 The charges for two or more bore spine duct are materially higher, hence why this is a conservative assumption.

91 Ofcom's modelling does not include assumptions on joint box hosting. We have therefore discussed with BT what a reasonable, but conservative, assumption could be for the purposes of our modelling. Based on these discussions, we have assumed 32.

92 i.e. 5 years of charges are included for 3- and 5-year TCOs, and 7 years of charges are included for 7-year TCOs.

A2 Overview of the BCMR 2019 and PIMR 2019 consultations

A2.1 PIMR 2019

115 The PIMR 2019 considers the upstream market for telecoms physical infrastructure and provides the legal basis for Ofcom to introduce UDPA.[93] Ofcom's key proposals on market definition and SMP are:

- **Single infrastructure product market**: Ofcom defines the market as the supply of access to telecoms physical infrastructure that comprises the ducts, poles and underground chambers used to supply fixed telecoms services.
- **Separate geographic markets**: Ofcom defines four geographic markets that mirror the markets defined in the BCMR 2019.
- **BT has SMP in all markets**: Ofcom finds that competition is not effective in all four geographic markets and hence that BT has SMP throughout the UK.

116 Ofcom explains that BT's SMP in the physical infrastructure market stems from its ability to deploy new fibre networks more flexibly, at lower cost, at greater speed, and with more extensive coverage and less risk than competitors who lack the advantage of BT's ubiquitous network. Absent regulation, Ofcom considers that BT would have the ability and incentive to distort downstream competition and/or harm consumers.[94]

117 Ofcom's analysis clearly indicates that it considers that BT's control of a ubiquitous physical telecoms infrastructure is the key bottleneck that underpins its SMP in infrastructure market and in downstream markets. This reflects the economic reality that building physical infrastructure involves large, risky, and sunk investments in civil infrastructure.

A2.2 BCMR 2019

118 The BCMR 2019 concerns the wholesale market for business connectivity services used to provide high capacity services used by businesses, mobile network operators and communications providers. This market is downstream from the physical infrastructure market since wholesale business connectivity services rely on physical infrastructure as an essential input.

119 Ofcom defines separate product markets for contemporary interface (CI) access services, and CI inter-exchange connectivity. We outline Ofcom's proposed findings in relation to product and geographic market definition, SMP and remedies for these markets below.

[93] Since this market is not one of the markets identified in the 2014 EC Recommendation hence Ofcom must apply the three-criteria test to demonstrate that ex ante regulation is required. Ofcom states the physical infrastructure market is the most upstream wholesale market that is related to retail markets in which competition problems have been found. See PIMR 2019, para. 3.6.

[94] For example, by refusing to supply access to its physical infrastructure, setting excessive wholesale prices or engaging in price squeezing, or discriminating against downstream rivals in favour of its own downstream businesses.

CI access service market

120 The CI access service market includes the wholesale supply of the connections to end-user business sites (e.g. office buildings or mobile base stations). These connections are provided at different bandwidths, with most circuits being at 100 Mbit/s, 1 Gbit/s, and 10 Gbit/s. Circuits with a bandwidth in excess of 1 Gbit/s are referred to as very high bandwidth ('VHB') circuits.

Product market definition

121 Ofcom proposes to define a single product market for CI access service that covers all bandwidths and includes all wholesale fibre Ethernet and WDM services used to connect end customers to fibre networks, as well as dark fibre used to supply CI access services. This is based on:

- Pricing evidence of chain of substitution with a potential break between 1 Gbit/s and VHB services.
- Ease of supply-side substitution across all bandwidths where suppliers already have a connection.
- Evidence that competitive conditions do not vary by bandwidth where there is no existing connection. This conclusion is based on evidence that the dig distance for network extensions is similar across bandwidths (based on self-build by CPs).

Geographic market definition

122 Ofcom's analysis of geographic markets is based an assessment of network reach in different postcode sectors. This involves the calculation of the number of telecoms providers other than BT that have network within reach of the business sites in each postcode sector.

- The network reach calculation is based on an estimate of the maximum dig distance (referred to as the 'buffer distance') that would be economic for a CP considering building a network extension from a flex point on its network to supply a site to which it is not connected.
- Ofcom uses a buffer distance of 50m that is based on its modelling of the economic dig distance based on the cost of self-build, and evidence of the actual dig distances observed.
- Ofcom assumes that a CP covers a postcode sector only if it is within the buffer distance and hence deemed able to supply at least 65% of the large business sites in the sector.

123 Based on its network reach analysis, Ofcom aggregates postcode sectors to define several separate geographic markets that reflect the presence of rival networks to BT. These are:

- BT only areas.
- BT+1 areas.
- HNR areas (BT+2) in Birmingham, Bristol, Edinburgh, Glasgow, Leeds and Manchester ('Metro areas').
- All other HNR (BT+2) areas in the rest of the UK (taken together).

- The Central London Area ('CLA').

SMP analysis

124 Ofcom proposes to find that BT has SMP in all geographic markets except the CLA.

125 In the BT only and BT+1 markets Ofcom explains that its SMP finding reflects BT's high service shares in excess of 50%, the limited availability of rival infrastructure close to customer sites, high barriers to entry and expansion, and the limited prospects for competition. In this regard, Ofcom states it considers any usage of DPA is unlikely to be widespread within the period of the BCMR 2019 review and therefore unlikely to result in effective competition by 2021.

126 In the Metro areas and the other HNR areas in the rest of the UK, Ofcom explains that its SMP finding reflects BT's high service share over 50%, evidence of BT's competitive advantage from being closer to a significant proportion of customer sites, BT's economies of scale and scope, high barriers to entry and expansion, and the limited prospects for potential competition.

Remedies

127 Ofcom proposes to implement remedies that vary by geographic market, in recognition of the variation in the degree of competition in different areas:

- BT only and BT+1 areas: Ofcom proposes to cap prices at their current level through a CPI-CPI control, and impose minimum quality of service standards at all bandwidths in BT only and BT+1 areas where there is no or limited competition.

- HNR areas (Metro and other BT+2 areas): Ofcom proposes lighter remedies in these areas with a requirement to provide network access at fair and reasonable prices, instead of a charge control, and no minimum quality standards.

128 Ofcom states that the lighter touch remedies in the HNR areas where there is already some competition take into account that unrestricted DPA is likely to become available during the review period.[95]

CI inter-exchange connectivity market

129 The CI inter-exchange connectivity market considers the connections between BT exchanges in different geographic markets. These comprise both backhaul connections between BT exchanges that serve as access aggregation nodes and core nodes, as well as core connections between exchanges that serve as core nodes. These leased line connections are important for fixed broadband operators such as Sky and Talk Talk as they are needed to backhaul broadband traffic from BT exchanges where they have equipment to their core networks.

Product and geographic market definition

130 As in the CI access services market, Ofcom proposes to define a single product market that includes all bandwidths on the basis of ease of supply-side substitution where a telecoms provider

[95] BCMR 2019, para. 10.30.

has an existing connection to the BT exchange. Ofcom considers that the conditions of competition vary at each exchange and proposes to define each BT exchange as a separate geographic market.

SMP analysis

131 In relation to SMP, Ofcom proposes to find that BT has SMP at all BT only exchanges, on the basis that there is a de facto monopoly at these exchanges, and it would not be economic for other operators to extend their networks to the vast majority of BT only exchanges, given the distances involved.

132 Similarly, Ofcom proposes to find that BT has SMP at all BT+1 exchanges where it faces competition from fewer than two other Principal Core Operators.[96] It argues that the presence of one rival network is not sufficient to ensure effective competition, and that it would also not be economic for other CPs to extend their networks to these exchanges.

Remedies

133 As in the CI access services market, Ofcom proposes to implement remedies that vary by geographic market with a requirement for BT to provide access to dark fibre at cost for connections from BT only exchanges, but not BT+1 exchanges.

134 Ofcom explains that this variation in remedies reflects the fact that it is confident that network competition is unlikely to develop in BT only exchanges as a result of DPA in the medium to long term.[97] However, Ofcom does not provide any detailed supporting analysis.

[96] To be classified as a Principal Core Operator, a telecoms provider must own its own fibre network, have a substantial footprint, and have capacity to offer wholesale inter-exchange connectivity. BCMR 2019, footnote 163.

[97] BCMR 2019, para. 10.15.


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Response to Ofcom's consultations on the Physical Infrastructure and the Business Connectivity Markets

Annexes 2-6

25 January 2019

Contents

A2 Weighted Average Cost of Capital

2.1 Ofcom has lowered its WACC estimate for the BCMR to 8.0%, from 9.8% (nominal, pre-tax) in its 2016 BCMR and 8.9% in the 2018 WLA. Ofcom continues with its disaggregated WACC approach, disaggregating the BT Group WACC into 'Openreach Access', 'Other UK Telecoms' and 'Rest of BT'. The 'Other UK Telecoms' WACC is applied to business connectivity markets, and specifically to dark fibre at BT-only exchanges in Ofcom's current BCMR proposals (where it proposes a cost-based charge control).

2.2 Ofcom's reduction in the WACC for 'Other UK Telecoms' relative to the 2018 WLA is driven by three principal changes:

- A reduction in the real total market return (TMR), the sum of the risk-free rate and the equity risk premium (ERP), from 6.3% to 5.8% in real terms against RPI;
- A reduction in the real risk-free rate, from 0% to -1.25% in real terms against RPI; and
- A reduction in the asset beta, from 0.73 to 0.65.

2.3 We have major concerns with all three of the above changes. Given the Government's stated aim of encouraging fibre investment, it would be inappropriate of Ofcom to lower its estimate of the cost of capital at this time. Ofcom's proposed reduction in the 'Other UK Telecoms' WACC from 8.9% in its March 2018 WLA decision to 8.0% in its BCMR consultation, in the space of only eight months, creates uncertainty for investors looking to commit capital, particularly because there has been no significant change in market fundamentals since the WLA decision. Ofcom recognises the uncertainty around estimating individual parameters underpinning its WACC calculation, and it should therefore exercise caution to ensure investors have sufficient certainty to invest in major capital projects such as fibre rollout.

2.4 Whilst the WACC applies to dark fibre at BT-only exchanges in Ofcom's current BCMR proposals, the estimate may have an impact on future Ofcom WACC determinations. Ofcom has historically relied on its previous determinations in informing future WACC estimates. For example, Ofcom's approach to estimating the total market return 'TMR' in this consultation and in the 2018 WLA determination includes references to prior regulatory precedent. Therefore, it is crucial that individual parameter estimates for this BCMR are set based on reliable and robust evidence, given Ofcom may rely on these estimates at future reviews, including the integrated market review due to commence in 2021.

2.5 We explain our concerns with Ofcom's changes further in this Annex, but in summary:

- **Total market return**: Ofcom places too much weight on some specific forward-looking Dividend Growth Model 'DGM' evidence, whilst ignoring other DGM-based estimates. Given that the DGM requires the use of subjective assumptions that produce a wide confidence interval for estimates, long-run historical evidence, based on actual observed returns, remains the most objective method for setting the expected TMR, and also captures the inherent stability in the TMR over time. We consider a real TMR (CPI-deflated) of 7.0%, based on long-run historical

evidence, as opposed to Ofcom's estimate of 6.7%, is therefore the most reliable estimate for this BCMR.

- **Risk-free rate:** Ofcom uses short-run averages of gilt yields, which result in unstable estimates across regulatory reviews. This creates unnecessary uncertainty for investors. Whilst long-run historical averages suggest a real risk-free rate slightly below zero, we show that interest rates are set to increase over the period. Given this, Ofcom's March 2018 real-risk free rate estimate of 0% remains appropriate. A real risk-free rate estimate of 0% is also consistent with ten and fifteen year historical averages of gilt yields, capturing the expectation that interest rates are expected to increase towards their long-run historical average in the coming years.
- **Asset beta**: Ofcom's estimate of 0.65 underestimates the asset beta for business connectivity markets, because it does not recognise that these markets tend to be more risky than the other services that fall within 'Other UK Telecoms'. There has been no material change in the systematic risk of business connectivity markets since Ofcom's 2016 BCMR decision. We therefore conclude its 2016 BCMR beta estimate of 0.70 remains appropriate.

2.6 We also estimate a higher cost of debt based on the higher risk-free rate above, which is a consequence of Ofcom's approach to estimating the cost of new debt as the sum of the risk-free rate and debt premium. A higher risk-free rate of 0% increases Ofcom's cost of new debt estimate from 2.9% to 4.2%, and consequently increases the overall cost of debt from 4.0% to 4.2%. We agree with Ofcom's move towards calculating the cost of debt as a weighted average of existing and new debt costs, including its calculation of the cost of existing debt based on BT's actual embedded debt costs.

2.7 Reflecting these amendments to the Ofcom approach, we estimate a WACC (nominal, pre-tax) for BCMR of 8.8% compared to Ofcom's estimate of 8.0% as set out below.

Table 1.1 - WACC Estimate with BT's proposed amendments

	Ofcom Estimate	BT Estimate
Real RFR	-1.25%	0.0%
RPI	2.9%	2.9%
Nominal RFR	1.6%	2.9%
Nominal ERP	7.2%	6.3%
Debt beta	0.10	0.10
Asset beta	0.65	0.70
Asset beta weight	65%	65%
Fwd-looking gearing	35%	35%
Equity beta	0.95	1.02
Cost of equity (post-tax)	8.4%	9.3%
Cost of equity (pre-tax)	10.2%	11.3%
Debt premium		
Corporate tax rate	17%	17%
Cost of debt (pre-tax)	4.0%	4.2%
WACC (pre-tax nominal)	**8.0%**	**8.8%**

2.8 In this annex, we discuss Ofcom's proposed approach to estimating each of the three parameters in paragraph 1.7 above, and propose alternative estimates.

Total Market Return

2.9 Ofcom's reduction in the TMR is driven by more weight being placed on forward-looking evidence derived from a dividend growth model 'DGM', rather than long-run historical averages that it placed weight on previously.[1] The forward-looking DGM estimates rely on subjective assumptions. Altering these assumptions to credible alternatives leads to materially different TMR estimates. Ofcom's approach is not, therefore, robust to reasonable alternative assumptions.

2.10 Long-run historical evidence continues to be the most appropriate basis for setting the TMR, pointing to a real TMR (CPI-deflated) of 7.0%, higher than Ofcom's estimate of 6.7%.[2]

2.11 Ofcom presents four types of evidence to estimate the TMR:[3]

- Historical ex post evidence: this suggests a TMR of around 6% to just over 7%;
- Historical ex ante evidence: this suggests a TMR of 6% or lower;
- Forward-looking evidence based on a DGM: Europe Economics estimates a range of 6.4% to 6.7%; and
- Empirical evidence of a positive relationship between the risk-free rate and TMR: Ofcom argues that the decline in gilt yields has coincided with a reduction in the TMR, which implies a lower TMR than in the past.

2.12 On the basis of the above, Ofcom provisionally concludes on a TMR range of 6.25% to 7.0%, derived in large part from Europe Economics' DGM evidence. The lower bound in Ofcom's range of 6.25% is not rooted in a particular empirical approach, as it is lower than Europe Economics' DGM estimates, and is not specifically derived from any of the alternative approaches Ofcom describes. Although Ofcom presents historical ex ante evidence that suggests a TMR of 6% or lower, and Europe Economics presents TMR estimates from other regulated sectors of 5% to 6.5%, Ofcom does not explicitly link its lower bound TMR estimate of 6.25% to either of these methods. Ofcom concludes on a point estimate of 6.7%, at the mid-point of its range.

Historical ex-post evidence

2.13 The most common approach to estimating the TMR is to draw on historical realised returns. This approach assumes that historical realised returns provide an unbiased estimate of the expected return over long time periods. Because the TMR tends to be relatively stable over time, long run historical returns are the most reliable method for

[1] Ofcom previously placed more weight on long-run historical averages of realised equity market returns. See for example, Ofcom (28 March 2018): "Wholesale Local Access Market Review: Statement", Appendix 20, paragraph A20.108, p105.
[2] In its BCMR consultation, Ofcom has reduced its estimate of the TMR (RPI-deflated) from 6.3% to 5.8%. Its real TMR (RPI-deflated) estimate of 5.8% equates to a real TMR (CPI-deflated) estimate of 6.7%. Henceforth in this section, when we refer to TMR estimates, we refer to the CPI-deflated estimates for consistency with Ofcom's analysis.
[3] A21.58

estimating the *expected* TMR going forward, as they capture, more accurately than other methods, this long-run stability.

2.14 Europe Economics themselves explain why a historical ex post approach provides an objective method for estimating the TMR:[4]

> *'The rationale for using this long time period (as long a time period as possible) is that it maximises the amount of information available on which to form a forward-looking estimate, i.e. an expectation about future market returns. The benefit of having as much information as possible is that the total market return, by definition, includes risky assets, and therefore the actual outturn in any one year is a poor indicator of expected returns in the future…By using very long-run series of returns, we aim to capture a significant portion of the total probability distribution of returns that an investor today might account for in decisions about the future.'*

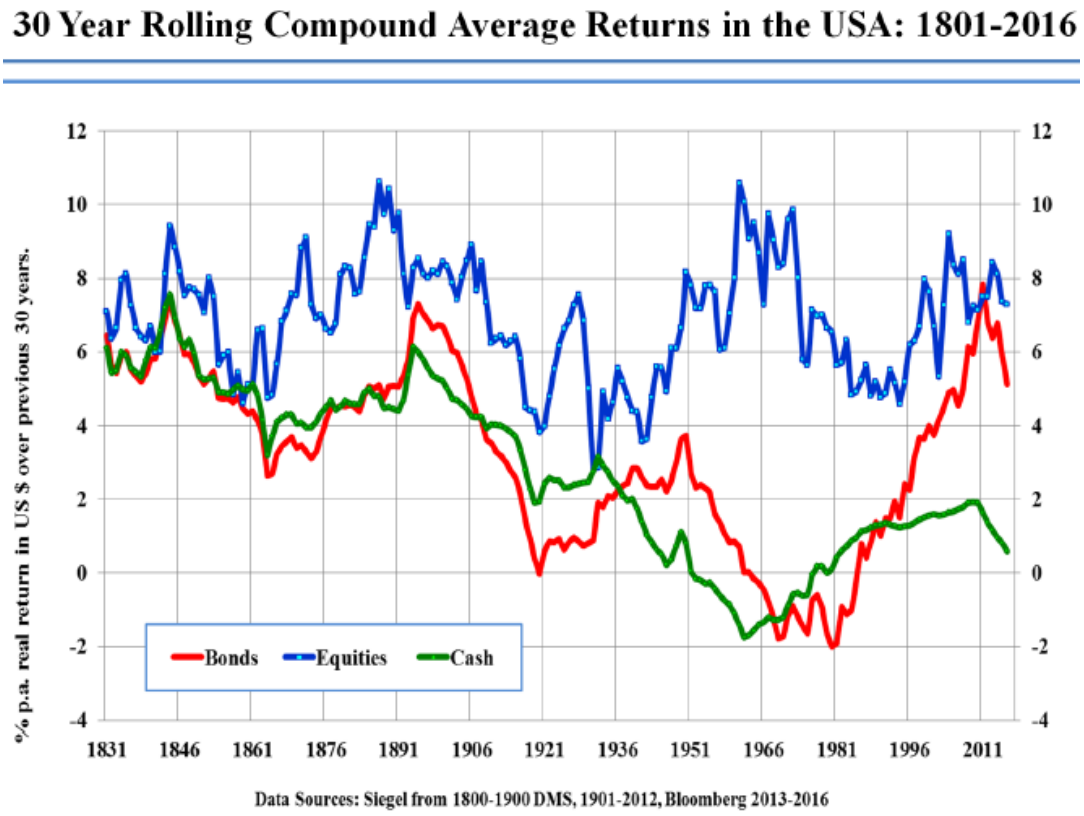
2.15 Ofcom uses the Dimson, Marsh and Staunton database to calculate the TMR based on long-run historical returns. This database is the standard reference point for UK regulators as well as financial practitioners. Based on this data source, Europe Economics estimates a TMR of 7.0%. This TMR estimate is the most objective estimate for setting the TMR for the BCMR (for the reasons that Europe Economics give).

2.16 We note an academic study commissioned by UK Regulators' Network (UKRN) in early 2018 supports the use of long-run historical realised returns to estimate the TMR.[5] The study concluded that long-run stock returns are stable in real terms, even following periods of very low interest rates, as shown in the figure below. Hence, there is no reason for investors to expect the TMR to be any different from its long-run historical average.

[4] Europe Economics (October 2018): "Cost of Capital: Total Market Return", p6.

[5] Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p38.

Figure 1.2 – Stability in equity returns in the long-run compared to instability in bond and cash returns



Source: Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p38.

Historical ex-ante evidence

2.17 Ofcom also presents TMR estimates based on historical *ex ante* evidence, where the TMR is estimated based on dividend yields and dividend growth rates. Ofcom finds that this approach provides a TMR estimate of 5.7% at most, lower than historical *ex post* estimates.

2.18 Ofcom suggests that relatively high realised returns (i.e. *ex post* returns) in the second half of the 20th century might have been based on unrepeatable factors, or simply good luck, such that historical *ex post* evidence could overstate future expected returns.[6]

2.19 This view appears to be prompted by adjustments made by Dimson, Marsh and Staunton (DMS) in their 2018 study[7] (which is cited by Ofcom) to strip out the portion of historical equity risk premia (derived from historical realised returns) which might be attributable to non-repeatable luck.[8]

[6] A21.52

[7] Dimson, E, Marsh, P, Staunton, M (February 2018): "Credit Suisse Global Investment Returns Handbook 2018", p31-36.

[8] DMS find that globally diversified investors might expect an arithmetic average ERP over treasury bills of 5.0%, which equates to an expected TMR of 5.9%. They state 'If we assume that the historical real growth rate of dividends on the world

2.20 But there is no clear evidential basis for the DMS adjustment. DMS simply assume that a proportion of historical dividend growth (decomposed from historical realised returns) can be attributed to good fortune, but this assumption is not supported by objective evidence showing that historical growth in dividends can be attributed to good fortune (or indeed bad fortune). Accordingly, the DMS study does not provide conclusive evidence of a reduction in expected market returns relative to historical realised returns.

2.21 We also note that the 2018 academic study (commissioned by UKRN) concluded that adjustments to historical realised returns (such as the ones in the DMS study) are not practical in a regulatory context. The UKRN study notes there is not yet a clear academic consensus on the quantitative link between valuation ratios and future returns, and hence an adjustment in a regulatory context would not be defensible using established academic theory.[9] The study concludes that unadjusted historical realised returns remain the most objective and defensible method for estimating the TMR in a regulatory context.

2.22 We consider that historical *ex ante* evidence is not appropriate for setting the TMR (nor should it be used to inform a TMR range) because they rely on adjustments that are not based on objective assumptions. The bottom end of Ofcom's TMR range (6.25%) appears to be partly informed by this historical *ex ante* evidence, and excluding this evidence would increase the bottom end of the range (and change the mid-point).

Forward-looking evidence

2.23 Ofcom commissioned Europe Economics to consider the most appropriate method for estimating the TMR in light of financial market conditions since the global financial crisis. Europe Economics argues that more weight might be placed on a forward-looking DGM than has been the case in the past. Further, that financial market conditions since the global financial crisis have resulted in lower market returns, and so less weight should be placed on long-run historical data.

2.24 We do not agree with the suggested role for DGM in estimating the TMR (nor Ofcom's reliance on the Europe Economics estimates). As Europe Economics themselves show, different assumptions about long-run dividend growth can result in a significant difference in the TMR estimate, and there is no objective method for determining the most appropriate assumptions. By contrast, long-run historical data provides an objective method because it represents *realised* returns, and is not, therefore, subject to varying assumptions about long-run dividend growth as is the DGM approach.

2.25 Moreover, the DGM results are volatile over time, which creates additional regulatory risk for investors, who place value on stability in the WACC estimate over time. This is particularly true in telecoms markets, where certain investments are made over a long time horizon with long asset lives.

index was at least half attributable to past good fortune, then the prospective premium on the world index declines to around 3½% per year.' Dimson, E, Marsh, P, Staunton, M (February 2018): "Credit Suisse Global Investment Returns Handbook 2018", p36.

[9] Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p41.

2.26 The subjectivity of Europe Economics' DGM can also be demonstrated by comparing its results with alternative DGMs developed by other independent parties. For example, both the Bank of England and Bloomberg publish TMR estimates based on a DGM, which are widely used by investors to calculate expected returns. Their results are typically higher than Europe Economics' estimates, providing strong evidence that DGM results are sensitive to underlying assumptions and therefore unsuitable as a tool for setting the TMR parameter in a regulatory context.

Table 1.3 – Comparison of Europe Economics TMR estimates with Bank of England and Bloomberg

Source	Total Market Return Estimate (Nominal)
Europe Economics for Ofcom	8.4% - 8.7%
Bank of England	c. 10.4%
Bloomberg	c. 13%

Note: We have restated Europe Economics' real TMR range of 6.4% to 6.7% in nominal terms, assuming 2% CPI inflation. Source: Ofcom 2018 BCMR Consultation, paragraph A21.54, p214, Figure A21.5, Bloomberg.

2.27 The Bank of England's ERP estimates (based on its DGM) are presented below. There are key differences between the Bank of England and Europe Economics in their assumptions on long-run dividend growth.

- The Bank of England assumes weighted-average international GDP growth forecasts (where the weights are the proportion of revenues generated by FTSE All-Share companies across different regions).[10]
- Europe Economics uses projections of UK GDP growth to forecast dividend growth.

2.28 Ofcom assumes the FTSE All Share Index is a benchmark investor's reference index.[11] Any TMR estimates based on the DGM should, therefore, reflect the expected market return of the FTSE All Share Index. Since the companies that make up the FTSE All Share Index earn revenues internationally, and not just in the UK, the expected market return of the index should reflect international growth prospects rather than solely UK domestic growth. The TMR based on the DGM should reflect international revenue growth rather than UK revenue growth alone (which is the approach adopted by Europe Economics).

2.29 The figure below compares long-run GDP growth forecasts for the UK (the Europe Economics basis for forecasting dividend growth) with international long-run GDP growth forecasts, derived from the weighted average GDP growth forecast for the countries in which FTSE All-Share companies derive their revenues (the Bank of England

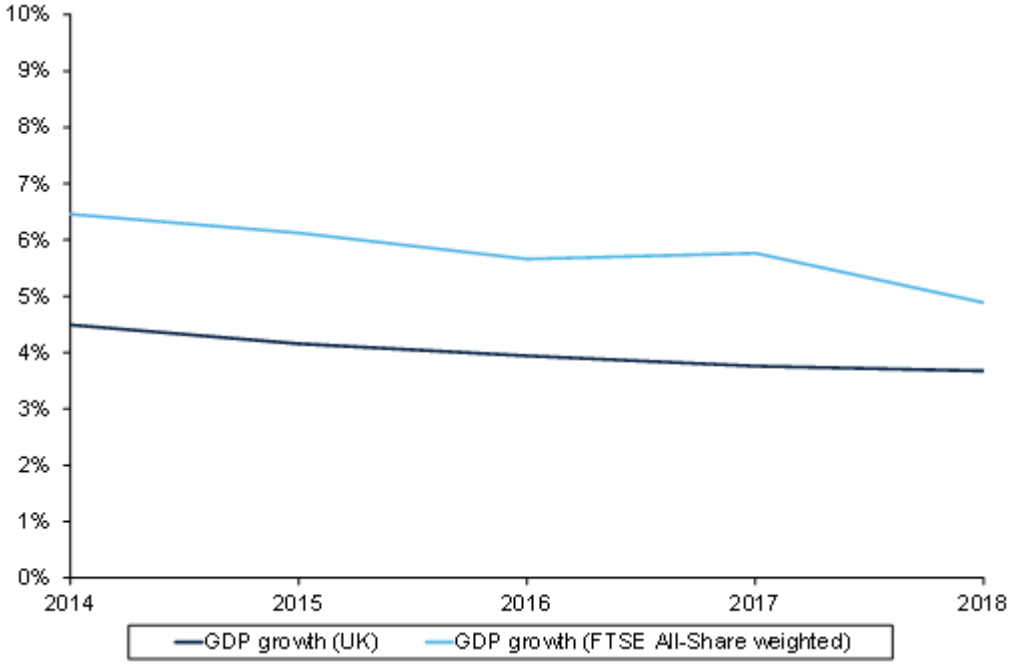
[10] The Bank of England notes that the FTSE All-Share has a high degree of international exposure. Firms in the index generate around 70% of their revenues outside of the UK. As a result, the Bank of England's dividend discount model attempts to capture the influence of the overseas growth outlook on the prospects for an equity index's dividend growth. The model assumes that at long horizons dividends are expected to grow in line with a weighted average of the long-term GDP forecasts for different regions. See Dison, W, Rattan, A (2017): "An improved model for understanding equity prices", Quarterly Bulletin 2017 Q2, p91.

[11] Ofcom's beta estimates for UK companies is based on a regression against the FTSE All Share index, implying its reference market is the FTSE All Share index. Source: A21.96.

approach).[12] The figure shows that the IMF has consistently forecast higher international long-run GDP growth than UK GDP growth over the past five years.

2.30 This implies estimates of the TMR for the FTSE All-Share index based on UK GDP growth would underestimate the actual TMR because FTSE All-Share companies are expected to grow at a faster rate in the long-run using more appropriate international GDP growth estimates. Therefore, Europe Economics' use of projections of UK GDP growth to forecast dividend growth in its DGM is not appropriate.

Figure 1.4 – Forecasts of UK growth are lower than international GDP growth



Source: Oxera analysis based on data from Bloomberg and IMF (2018): "World Economic Outlook"

2.31 The Bank of England's DGM analysis current implies an ERP of around 9%.[13] As current spot rates on 10-year UK gilts are around 1.4%, this implies a nominal TMR of 10.4%, around 1% higher than the top end of the TMR range presented by Europe Economics based on its DGM. The difference in estimates highlights the subjectivity of TMR estimates based on the DGM.

[12] The figure shows GDP growth forecasts from the IMF, and the weighted average international GDP growth forecast is calculated using weights that represent the proportion of revenues generated by FTSE All-Share companies across the different regions in which they operate.
[13] Ofcom, Figure A21.5

Figure 1.5 - Bank of England ERP estimates derived from a DGM

Source: Ofcom (November 2018): "Business connectivity market review", p217, Figure A21.5.

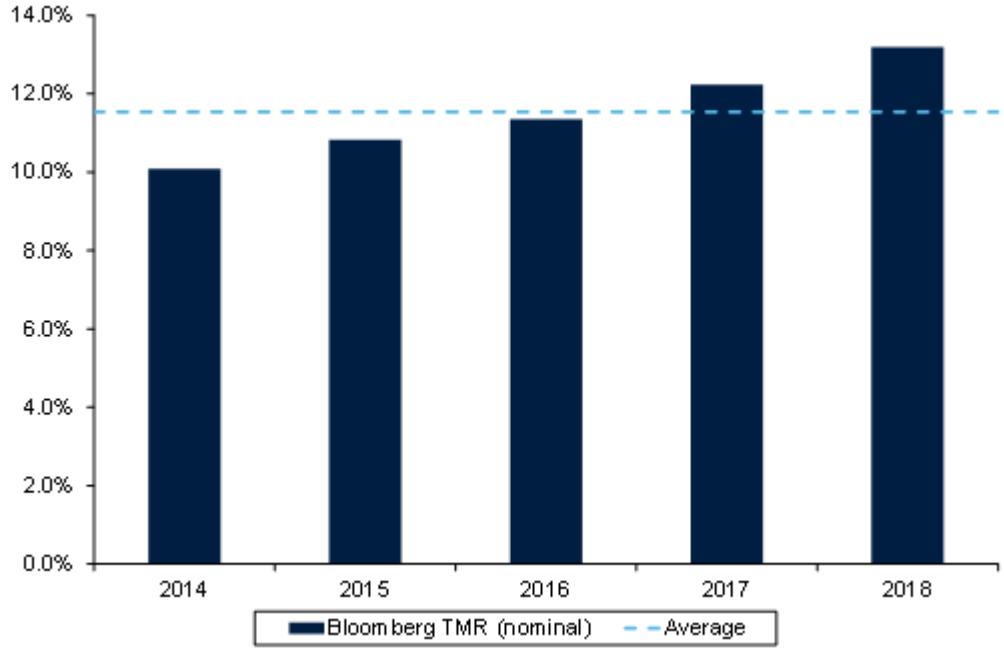
2.32 Ofcom considers it is reasonable for Europe Economics' estimate of the ERP to be lower than the estimates presented by the Bank of England, since the estimate "*of the RFR, from which* [Ofcom's] *ERP is derived, is informed by more recent evidence on government gilts*".[14] However, Figure 1.5 above shows that the Bank of England's ERP estimates based on its DGM have been stable over the last 4-5 years, so shortening the averaging period of government gilts to give more weight to recent evidence would not materially change the Bank of England's TMR results. Ofcom has therefore not justified why Europe Economics' assumptions are more appropriate than the Bank of England's.

2.33 We have also compared Europe Economics' TMR estimates with Bloomberg's estimates. Bloomberg estimates the TMR using its own proprietary three-stage DGM. These estimates are widely used by investors and industry professionals.

2.34 Bloomberg's estimate of the UK nominal TMR in 2018 was around 13%, more than 3% higher than the top end of Europe Economics' range. Bloomberg's TMR estimates have been consistently higher than Europe Economics' range for the past five years. This places further doubt on Europe Economics' DGM analysis, highlighting that DGM-based estimates tend to vary widely depending on the choice of dividend growth assumptions.

[14] A21.66

Figure 1.6: Bloomberg DGM TMR estimates



Source: Oxera analysis based on data from Bloomberg

2.35 Finally, we note that the UKRN 2018 study also argued against the use of DGMs to estimate the TMR in a regulatory setting. The study argued that DGM estimates tend to provide a very wide range of results depending on the assumptions used,[15] and therefore identifying a reasonable range and an appropriate point estimate for the purposes of regulation is challenging:[16]

> "*we cannot point to a methodology for using DDM* ['Dividend Discount Model', also known as Dividend Growth Model] *to calculate the EMR* ['Expected Market Return'] *that would be simultaneously implementable and defensible*"[17]

Relationship between risk-free rate and TMR

2.36 Ofcom argues that there is a positive relationship between the TMR and the risk-free rate. Europe Economics estimates correlation coefficients between the real TMR, based on its DGM estimates, and risk-free rate based on gilt yields between 2004 and 2018, and finds that the correlation coefficient is between 0.3 and 0.6. Because gilt yields have declined since the global financial crisis, Ofcom argues the TMR must have also declined, which warrants a lower estimate than in its previous decisions.[18]

2.37 However, Europe Economics' analysis of the correlation in returns is based on a very short period of data. Given TMR estimates based on the DGM tend to be volatile over time, a long period of data is required to establish a well-founded link between the risk-

[15] Wright, S, Burns, P, Mason, R, Pickford, D (2018): "Estimating the cost of capital for implementation of price controls by UK Regulators - An update on Mason, Miles and Wright (2003)", p44-46.
[16] Ibid., p47.
[17] The 'expected market return' is also known as the total market return in this context.
[18] A21.55 – A21.56.

free rate and the TMR. Academics have reviewed such long-run historical data to evaluate whether there is a causal link. Siegel (1998), who analysed 200 years of US stock market data, finds a remarkable degree of stability in equity returns over time, in contrast to the risk-free rate:[19]

> *"the growth of purchasing power in equities not only dominates all other assets but is remarkable for its long-term stability. […] This remarkable stability of long-term real returns is a characteristic of mean reversion, a property of a variable to offset its short-term fluctuations so as to produce far more stable long-term returns. […] As stable as the long-term real returns have been for equities, the same cannot be said of fixed-income assets."*

2.38 Finance theory explains that there is a negative relationship between the risk-free rate and the ERP which is associated with increased risk aversion and the so called "flight to safety" effect during periods of economic and financial crisis. At times of economic uncertainty, investors dispose of risky assets such as equity in favour of assets such as government bonds which offer a reasonable proxy for risk-free assets. This reduces the price of equities and increases the premia for holding risky assets, while reducing yields on risk free assets.[20]

2.39 Empirically, a number of studies have found that the negative relationship between the risk-free rate and ERP is one-for-one in the long run (which implies that the TMR is stable over time). For example, the 2018 UKRN study highlighted the stability of equity market returns compared to bond returns, implying the risk-free rate and ERP are inversely related with a one-for-one relationship in the long run. Figure 1.2 shows that periods of negative real interest rates, such as the current interest rate environment, are not unique. The 1950s and 60s were also periods of negative real interest rates, and also coincided with an ERP above the long-run average.

2.40 Given the expected TMR is inherently unobservable, we do not consider it appropriate for Europe Economics to infer a positive correlation between the risk-free rate and TMR based on only 14 years of data. The long-run historical data demonstrates there is an inverse one-for one relationship between the risk-free rate and ERP, such that the TMR is stable, and hence the TMR should not be lowered following a decline in the risk-free rate. [21]

TMR conclusion - Ofcom has placed too much weight on forward-looking DGM evidence, even though it relies on subjective assumptions on dividend growth, which if changed, lead to higher estimates of the TMR. Long-run historical evidence remains the most objective method for setting the expected TMR, and also captures the inherent stability in the TMR over time. Therefore a real TMR (CPI-deflated) of 7.0%, based on long-run historical evidence should be used.

[19] Siegel (1998), Stocks for the Long Run. McGraw-Hill, second edition, p.11, 13.
[20] Wright, S. et al. (September 2006), Report on the Cost of Capital – provided to Ofgem, Smithers & Co Ltd;
[21] We note that even if there is a positive relationship between the risk-free rate and the TMR, Ofcom's TMR estimate does not take account of the expectation that interest rates are likely to rise in the coming years. The market is currently forecasting that interest rates will increase, and under Ofcom's view of a positive relationship with the TMR, this will result in an increase in TMR relative to current levels.

Risk-free Rate

2.41 BT does not agree with Ofcom's proposed change to the risk-free rate based on the use of spot rates and short-term averages rather than long-term averages as this will result in estimates that are likely to be volatile over time. If spot rates are used, Ofcom should recognise market expectations that rates will rise over the review period. Our reasoning is set out below.

2.42 Ofcom estimates a real risk-free rate of -1.25%,[22] compared to 0% in its WLA decision in March 2018. This is mainly because Ofcom gives more emphasis to shorter-run and spot yields of index linked gilts 'ILG' than to longer run average yields.

2.43 Ofcom argues that long-run averages result in a risk-free rate that is slow to adjust to current market data, and therefore may not result in efficient price and investment signals.[23] Noting that low gilt yields have persisted for a long period of time since the global financial crisis and are unlikely to return to pre-crisis levels soon, Ofcom concludes that short-run averages and spot yields are now more relevant for setting the risk-free rate. Ofcom calculates the 5-year average yield as -1.25% and the spot yield as -1.7%, based on data up to August 2018, and selects the 5-year average as its final point estimate.

2.44 Ofcom's change in method towards short-run averages has two principal drawbacks: (1) it does not reflect market expectations that interest rates will increase, and (2) it results in unstable risk-free rate estimates over time, creating unnecessary regulatory instability.

2.45 Ofcom's reduction in the risk-free rate since its March 2018 WLA decision by 125bps is particularly at odds with changes in interest rate expectations over that period. Market indicators, including from the Bank of England and other independent forecasting agencies, all point towards an increase in interest rates in the coming years. Despite no discernible change in market fundamentals for interest rates since its 2018 WLA decision and with interest rates expected to move upwards, Ofcom has exercised its own discretion in changing its methodology to reduce the risk-free rate by 125bps.

<u>Ofcom's approach does not factor in current expectation of increasing interest rates</u>

1.1. Table 1.7 below shows forecasts of the Bank of England Base Rate by a range of different forecasting agencies, as reported by HM Treasury. The forecasts reported in August 2018, Ofcom's data cut-off date, show the base rate was expected to increase from an average of 0.64% in 2018 to 1.71% by 2021, an increase of more than 100bps. More recent forecasts from November 2018 also predict a similar increase in the base rate.

[22] A21.31
[23] A21.27 - A21.28

Table 1.7: **HM Treasury Consensus Forecasts of Official Bank Rate**

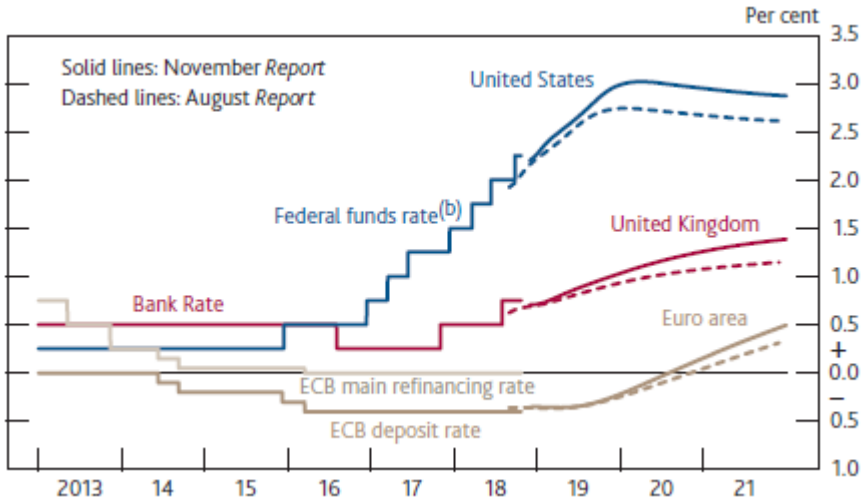
	2018	2019	2020	2021	2022
August 2018 Forecast	0.64%	0.98%	1.42%	1.71%	1.99%
November 2018 Forecast	0.64%	0.98%	1.34%	1.59%	1.84%

Note: Table shows new forecasts of Official Bank of England Base Rate. Source: HM Treasury: "Forecasts for the UK economy, Table M4, August 2018, November 2018.

2.46 This increase in the Bank of England base rate is likely to result in a similar increase in gilt yields given the strong degree of correlation between the base rate and gilt yields in the long-run. We would therefore expect gilt yields to also increase up to 2021, in line with forecasts of the base rate.

2.47 The Bank of England also reports market-implied interest rates up to 2021 based on swap rates. The market is pricing in an increase in interest rates of at least 80bps by 2021, broadly consistent with the forecasts reported by HM Treasury above. Forward-looking evidence clearly points to an increase in interest rates relative to current levels.

Figure 1.8 – Market Implied Path for Interest Rates



Source: *Bank of England Inflation Report November 2018, Chart 1.7, p6.*

2.48 We note Ofcom does present some evidence on forward rates on gilts, which are around -1.5% over the course of the BCMR. Ofcom uses this forward rate evidence to justify setting a risk-free rate estimate above spot rates of around -1.7%. However, as shown in Ofcom's Figures A21.2 and A21.3, forward rates are a poor predictor of future yields. For example, the forward rate for the 5-year gilt in three years' time reported in June 2014 was around 0.1%, compared to an actual 5-year gilt yield in June 2017 of around -2.0%. This discrepancy between the forward rate and the actual yield can be consistently observed in the data Ofcom presents.

2.49 The evidence above on the future path of interest rates suggests that Ofcom's position, that rates are unlikely to revert back towards pre-crisis levels for the foreseeable future, is incorrect. In fact, interest rates have already started to increase and are predicted to continue to do so up to 2021 by around 80-100bps.

2.50 A further factor that could cause gilt yields to increase up to 2021 is higher sovereign risk due to Brexit. Rating agencies have already downgraded UK's sovereign credit rating due to Brexit,[24] and have highlighted risks of further downgrades depending on how risks associated with Brexit unfold. Any further downgrades to UK's sovereign rating will result in higher gilt yields, and therefore a higher risk-free rate. Ofcom has not factored in the risk of such a rating downgrade in its risk-free rate estimate, and therefore its estimate does not reflect potential scenarios that could affect market interest rates.

Short-term averages lead to volatile risk-free rate estimates over time

2.51 We also consider Ofcom's change in approach to using short-term averages results in unnecessary regulatory instability. By definition, short-term averages include fewer data points than long-run averages, and hence they are more volatile over time. Using short-term averages could then result in large changes in the risk-free rate estimate across regulatory decisions, and even between a consultation and final decision. Ofcom previously accepted this argument when using long-run averages, as it noted "using averages avoids putting too much weight on spot rates which may be volatile and avoids large swings from one regulatory decision to the next".[25]

2.52 These arguments continue to be as relevant as they were before. Regulatory stability encourages investor certainty and incentivises investment. We see no reason for Ofcom to now shift away from long-run averages, which are the most reliable method for ensuring stable risk-free rate estimates over time. For this reason, the risk-free rate should be estimated on the basis of long-run averages, in line with the approach taken by Ofcom in its March 2018 WLA decision (a matter of months ago).

Risk free rate conclusion - Ofcom proposes to use shorter-run averages of gilt yields, but this will create unnecessary uncertainty for investors. Longer run averages are less volatile and reduce uncertainty. Whilst long-run historical averages suggest a real risk-free rate against RPI which is slightly below zero, interest rates are set to increase over the period. Given this, Ofcom's March 2018 real-risk free rate estimate of 0% remains appropriate.

Asset Beta

2.53 Ofcom has lowered its estimate of the 'Other UK Telecoms' asset beta from 0.73 to 0.65, driven by a reduction in the empirical beta estimates for UK and European telecoms companies. Ofcom continues with a beta disaggregation approach, where it estimates the BT Group beta first, and then disaggregates it into three constituent elements: 'Openreach Copper Access', 'Other UK Telecoms' and 'Rest of BT'. Ofcom considers the 'Other UK Telecoms' beta is the most appropriate for capturing the risk associated with BT's business connectivity markets. With respect to Ofcom's beta analysis, we have considered the following:

[24] Financial Times (22 September 2017): "UK downgraded by Moody's amid Brexit pressures".
[25] A21.24

- Ofcom's estimate of the BT Group beta;
- The appropriateness of using the 'Other UK Telecoms' beta for business connectivity markets;
- Ofcom's beta range for 'Other UK Telecoms'; and
- Implications of Ofcom's beta estimate for 'Other UK Telecoms' on betas for 'Openreach Copper Access' and 'Rest of BT'.

BT Group Asset Beta

2.54 Ofcom's estimates BT Group's asset beta as 0.71, a reduction from 0.78 in its 2018 WLA statement. Ofcom presents rolling 2-year and 5-year beta estimates, and notes that BT's 2-year beta dropped sharply in June 2018, and attributes it to a 'referendum effect', where volatile data around the June 2016 referendum drops out of the two-year estimation window. Because of the degree of uncertainty associated with the referendum and its associated impact on BT's beta, Ofcom has moved to 5-year estimation windows, which it considers "*strikes a better balance between regulatory stability and efficient price and investment signals*".[26]

2.55 We agree with Ofcom's adoption of a 5-year estimation window in light of the impact of Brexit on BT's beta. When setting a beta for a future regulatory period, market volatility associated with atypical market events could skew historical beta estimates such that they do not reliably capture forward-looking risk. By extending the estimation window from two to five years, Ofcom places less weight on these atypical events, and hence its beta estimate is less likely to be biased.

2.56 The limitation of extending the estimation window to five years is that it places less weight on recent market information, and hence the beta estimate may not reliably measure the market's current perception of a firm's systematic risk. Ofcom has to balance its view of the estimation window at each regulatory review to take account of both the current market view of systematic risk as well as adjusting for atypical events that skew beta estimates temporarily.

2.57 At future regulatory reviews, Ofcom will continue to evaluate whether the decline in BT's beta due to the referendum effect is reflected in BT's beta. Ofcom's consultant, NERA, argues that the decline in BT's beta could be due a 'foreign earnings' effect. NERA hypothesises that UK-focused companies in the FTSE All Share index underperformed the index because of sterling depreciation following the Brexit vote. As a result, their beta fell when estimated against the FTSE All Share Index. NERA presents evidence of declining asset betas for BT, TalkTalk and Sky following the Brexit vote, all of which are primarily UK-focused, whereas the beta for Vodafone, which is internationally diversified, remained largely unaffected.

2.58 The implication of NERA's analysis is that if sterling appreciates in the next few years, UK-focused companies should outperform the FTSE All Share Index, and hence their betas should increase. Ofcom should allow some headroom in its beta estimate to allow for the risk of future changes in the exchange rate. In such settings, Ofcom should err on the side of caution and select a beta above the mid-point of its range to avoid the

[26] A21.100

risk of selecting too low a point estimate, thereby harming investment incentives.

Using the 'Other UK Telecoms' beta for Business Connectivity Markets

2.59 After estimating the BT Group beta, Ofcom disaggregates it into 'Openreach Copper Access', 'Other UK Telecoms' and 'Rest of BT'. Ofcom argues the 'Other UK Telecoms' beta appropriately captures the risk associated with BT's business connectivity markets, and estimates a range of 0.55 to 0.75, selecting a point estimate at the mid-point of the range. Ofcom's point estimate of 0.65 is a reduction from its WLA statement estimate of 0.73.

2.60 Ofcom's beta point estimate of 0.65 does not adequately capture the systematic risk associated with BT's business connectivity markets. As Ofcom notes in its consultation document, 'Other UK Telecoms' includes a wide range of BT services, including business connectivity markets, mobile, fixed retail services, TV and other retail services. Ofcom makes no distinction in risk between each of these different elements.

2.61 In estimating the beta for BT's business connectivity markets, Ofcom has resorted to disaggregating BT Group's asset beta as a pragmatic approach to assessing risks associated with individual regulated markets. Although there are no pure-play listed comparators for these services, under this beta disaggregation approach, each of Ofcom's constituent elements are not comprised of services that all have the same risk. This is not appropriate. Ofcom argues that the constituent elements in 'Other UK Telecoms' face similar risk because (1) they all rely on the same fixed telecoms networks, and hence have similar degrees of operational gearing, and (2) because they involve sales to customers who can scale demand in response to changes in wider economic conditions. However, we disagree with Ofcom's reasoning on both counts.

2.62 The different business segments in 'Other UK Telecoms' do not all rely on the same fixed networks. Although business connectivity markets rely on fixed networks, with high fixed and sunk cost (resulting in higher operational leverage), not all retail markets do. For example, BT's mobile revenues are classified under 'Other UK Telecoms', and rely principally on mobile network infrastructure, which typically has lower fixed and sunk costs than fixed networks, and hence has lower operational leverage. Even for BT's fixed line retail services, which are also classified under 'Other UK Telecoms', these revenues rely on wholesale inputs that vary by the volume of customers served, implying that fixed line retail costs are largely variable and operational leverage is low. Therefore, in comparison to business connectivity markets, operational leverage for mobile and fixed retail services are much lower, and so beta risk for business connectivity markets should be higher for mobile and fixed retail services, all else being equal.

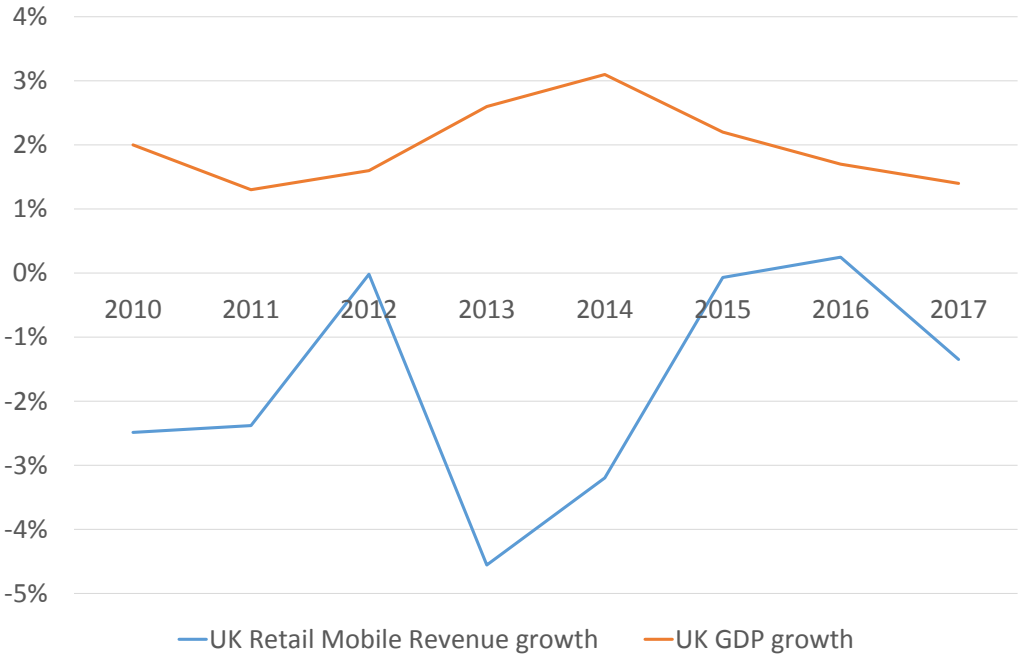
2.63 We disagree with Ofcom's suggestion that customers for all the different services in 'Other UK Telecoms' can scale demand to a similar degree in response to changes in macroeconomic conditions. The degree to which customers scale demand in response to changes in the economy depends on their income elasticity, (i.e. the sensitivity of their demand o changes in income). Within 'Other UK Telecoms', demand for business access services are more likely to vary with changes to the economy than demand for fixed retail or mobile services, because business customers tend to be more sensitive to changes in the economy than residential customers of fixed or mobile services. Ofcom alludes to this when comparing the relative risk of leased lines with Openreach copper

access:[27]

> *"Wholesale leased lines revenue is also likely to be more variable due to volume changes, whereas revenues from local access connections – particularly to residential properties – will typically vary less with the economic cycle"*

2.64 The lower volume risk associated with mobile telecoms is shown in Figure 1.9, which highlights the insensitivity of UK retail mobile revenue growth to changes in UK GDP growth, pointing to low income elasticity of demand. In fact, the correlation coefficient over the period from 2011 to 2017 is negative, potentially suggesting countercyclical movements in UK mobile revenue growth. The evidence demonstrates that investors would expect mobile services to face lower volume risk than business connectivity markets.

Figure 1.9 – Trend in UK retail mobile revenue growth is insensitive to UK GDP growth



Source*: Ofcom Communications Market Report 2014-18, Office for National Statistics; Note: UK retail mobile revenues are converted to real CPI prices. UK GDP growth represents Q on Q4 growth for the 4th quarter in each year.*

2.65 We therefore conclude business connectivity markets are likely to be more risky than the other services categorised under 'Other UK Telecoms', both because they face higher operational leverage and because demand for them is more sensitive to changes in macroeconomic conditions. Our comparison of relative risk of individual services that are categorised under 'Other UK Telecoms' is summarised below.

[27] A21.117

Table 1.10 - Summary of Relative Risk across Services in 'Other UK Telecoms'

	Business Connectivity Markets	Fixed Line Retail Services	Mobile Retail Services
Operational leverage	High	Low	Medium
Volume Risk	High	Medium	Low

2.66 Further, Ofcom's beta analysis ignores the fundamental risk profile of business connectivity markets, and does not address why beta risk has declined compared to its BCMR decision two years ago. NERA presents volume risk for leased lines between 2011 and 2018, which shows broad stability both in monthly variances in leased lines and in the ratios of actual volumes to forecast volume. This points to no change in overall volume risk for leased lines compared to two years ago.

2.67 Moreover, BT is still exposed to volume risk under Ofcom's BCMR consultation proposals, just as it has been in the past under price controls which do not flex with volumes. Given this, and in the absence of any reasoning to the contrary, we do not see any justification for Ofcom to lower its beta estimate from its 2016 BCMR decision.

2.68 In recognition of differences in risk between different segments within 'Other UK Telecoms', Ofcom should select a beta estimate for business connectivity markets above the mid-point of its range of 0.55 to 0.75 for 'Other UK Telecoms'.

Ofcom's choice of comparators to estimate the beta for 'Other UK Telecoms'

2.69 Ofcom's beta range for 'Other UK Telecoms' is informed by beta estimates for UK listed telecoms operators and European listed telecoms operators.

2.70 Ofcom begins by estimating an average UK telecoms operator beta of 0.62, which incorporates betas for TalkTalk, Sky and Vodafone. However, Ofcom then notes that Sky's beta has been depressed since early 2018 because it has been subject to bid speculation for an extended period, which means it should be excluded from the UK comparator set. We agree with Ofcom that Sky should be excluded from its comparator set. Bid speculation leads to a company's share price being affected by temporary market speculation, and hence the resulting beta estimate does not capture the true covariance with the market. Excluding Sky increases the average UK telecoms beta to 0.66.[28]

2.71 Ofcom also presents empirical beta estimates for European listed telecoms operators, estimating a range of 0.39 to 0.66 against the FTSE All Europe Index and 0.43 to 0.74 against the FTSE All World Index. Our analysis suggests that NERA has not estimated the betas of some of these European comparators against an appropriate reference index.

2.72 As part of the analysis of asset and equity betas for BT Group, NERA used a FTSE All-

[28] Sky has been delisted from the London Stock Exchange since 7 November 2018. Ofcom can therefore no longer inform its beta estimate based on Sky, and we expect its updated beta estimates for UK listed telecoms operators in its BCMR statement to only refer to TalkTalk and Vodafone. Source: https://www.lseg.com/sites/default/files/content/documents/MARKET%20NOTICE%202018-067%20Delisting%20of%20SKY%20Plc.pdf

Europe benchmark for the European comparator sample. Overall, this approach is appropriate for the European comparator sample. However, we note that the European comparator sample includes a number of non-euro quoted companies (namely Telenor, Swisscom and Tele2). It is not clear if the currency differentials for these companies have been accurately accounted for.

2.73 Therefore, we have re-estimated the equity betas for Telenor, Swisscom and Tele2 benchmarking against the relevant domestic index and calculated the asset beta on the basis of levels of gearing reported by NERA.[29] The results are presented in Table 1.11 below.

Table 1.11 – Asset Betas for Telenor, Swisscom and Tele2 when estimated against appropriate domestic reference index

Five-year Asset beta	*Telenor*	*Swisscom*	*Tele2*
NERA	0.51	0.47	0.65
Estimated against domestic index	0.65	0.51	0.69
Difference	**0.14**	**0.04**	**0.04**
Two-year asset beta			
NERA	0.40	0.48	0.74
Estimated against domestic index	0.58	0.54	0.69
Difference	**0.18**	**0.06**	**-0.05**

Note: Oslo Bors Index, Swiss Market Index and OMX Stockholm 30 Index were used to estimate the equity beta of Telenor, Swisscom and Tele2 respectively. The cut-off date is 20 July 2018. The asset betas are derived on the basis of gearing reported by NERA.

Source: Oxera analysis based on data from Bloomberg and NERA (2018), 'Cost of Capital: Beta and Gearing for the 2019 BCMR', 11 October, p. 32, Table 3.9.

2.74 Table 1.11 shows that the asset betas for Telenor, Swisscom and Tele2 are higher on average if they are estimated against an appropriate domestic reference index. As a result of these changes, the top end of the European Telecoms five-year asset beta range increases from 0.66 to 0.69 as the updated asset beta for Tele2 places an upward pressure on that range. The average 5-year asset beta for the European telecoms operators would also increase as a result of this correction to the beta estimation approach.

2.75 We conclude that Ofcom should adjust the empirical evidence it has relied on to inform its asset beta estimate for 'Other UK Telecoms'. Removing Sky from the sample increases the average beta for UK telecoms operators' to 0.66 and adjusting the betas for non-Eurozone operators to reflect the appropriate domestic reference index increases the top end of the European telecoms beta range to 0.69. Both of these estimates are higher than Ofcom's beta point estimate for 'Other UK Telecoms' of 0.65. Taken with the evidence above comparing leased line risk with other segments in 'Other

[29] NERA (2018), 'Cost of Capital: Beta and Gearing for the 2019 BCMR', 11 October, p. 32, Table 3.9.

UK Telecoms', Ofcom should therefore increase its beta estimate from 0.55 to 0.75.

Implications on beta for 'Rest of BT'

2.76 An implication of Ofcom's approach to disaggregating BT Group's beta is that it must consider whether the beta estimate for 'Rest of BT' is plausible. Rest of BT principally consists of BT's Global Services division, which provides a range of ICT services, such as managed networks, cloud computing and IT consulting.

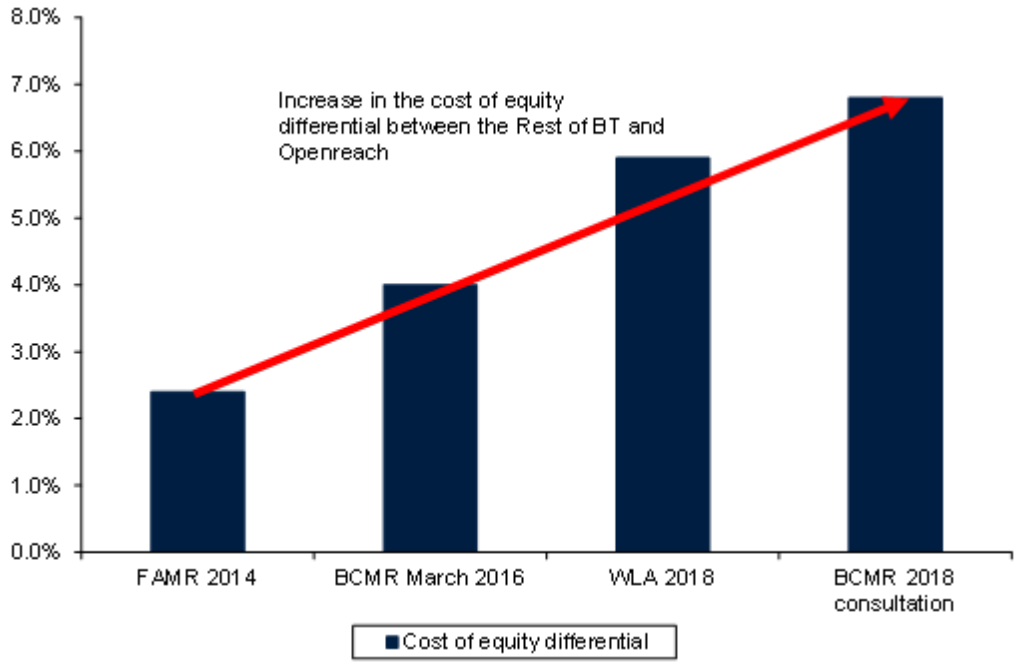
2.77 Ofcom estimates an asset beta range of 0.70 to 1.25 for 'Rest of BT', reflecting the wide range in estimates for global ICT comparators. Ofcom evaluates whether its point estimate for 'Other UK Telecoms', combined with its BT Group beta estimate and 'Openreach Copper Access' beta estimate results in a plausible point estimate for 'Rest of BT'. Its calculations imply an asset beta point estimate of 1.17 for 'Rest of BT', which is well above the average of the range for global ICT comparators (and is in fact at the top end of the range). This provides evidence that the betas for regulated parts are set too low, i.e. had some of the other betas been set higher (e.g. betas for Openreach or 'Other UK Telecoms'), then the residual beta for 'Rest of BT' would have been closer to the mid-point of the comparator range.

2.78 Ofcom should also have undertaken a relative risk assessment of 'Rest of BT' versus 'Other UK Telecoms', to determine whether the gap in its asset beta estimates for the two segments is plausible given fundamental systematic risk drivers. 'Rest of BT', primarily comprised of BT's Global Services unit, supplies voice and data connectivity services as its core product internationally, through products such as BT Connect.[30] These services are similar in systematic risk to many of the services Ofcom categorises under 'Other UK Telecoms'. For example, Ofcom categorises retail fixed voice services in 'Other UK Telecoms', which includes voice services provided to UK enterprise customers. The systematic risk for voice services provided to UK enterprise customers is likely to be similar to voice connectivity provided by Global Services to international customers. Moreover, Ofcom has not shown any evidence of Global Services having higher operating leverage than 'Other UK Telecoms' to explain its higher asset beta for Global Services. The gap in Ofcom's beta estimates for 'Rest of BT' and 'Other UK Telecoms' is therefore not supported by an assessment of relative risk.

2.79 Figure 1.12 shows the difference in the determined cost of equity for 'Rest of BT' and Openreach across Ofcom's recent determinations.

[30] BT Connect includes a set of services that connect customers to their people, their customers and to the cloud. They include hybrid IP, Ethernet and internet virtual private network services. Source: BT Group plc, Annual Report 2018, p94.

Figure 1.12 - Equity betas – Ofcom final determinations on cost of equity in recent reviews



Source: Oxera analysis based on Ofcom regulatory precedent

2.80 We consider that Ofcom's latest determinations have set the disaggregated betas incorrectly, such that the gap between the beta estimates for 'Rest of BT' and Openreach is now implausibly large.

2.81 An asset beta of 0.70 for 'Other UK Telecoms' combined with Ofcom's beta estimates for BT Group and 'Openreach Copper Access' would imply an asset beta of 0.95 for 'Rest of BT'. This resulting estimate for 'Rest of BT' is much closer to the mid-point of the range for global ICT comparators (0.70 to 1.25) and ensures greater consistency of Ofcom's beta estimates in the round.

Asset beta conclusion - We consider Ofcom's asset beta estimate for 'Other UK Telecoms' of 0.65 is too low, primarily because it does not account for the higher risk faced in business connectivity markets than in other segments comprising 'Other UK Telecoms'. An asset beta of 0.70, equal to Ofcom's 2016 BCMR estimate is more appropriate, as there has been no fundamental shift in systematic risk for business connectivity markets over the last year. We also find Ofcom's implied asset beta of 1.17 for 'Rest of BT' implausibly high, because it is not based on an assessment of relative risk between BT's different business segments. Our implied asset beta estimate of 0.95 for 'Rest of BT' is more consistent with empirical evidence for comparators and an assessment of relative risk.

Cost of Debt

2.82 We agree with Ofcom's change in approach to the cost of debt which is to use the actual cost of debt plus a forecast for the cost of new debt issued over the forecast period. As Ofcom notes, the use solely of forward-looking debt costs would not allow an efficiently financed firm fair opportunity to recover efficiency incurred costs in the current circumstances. We do however suggest that Ofcom updates its estimate of the cost of new debt in the Statement as yields on BBB bonds have been increasing since August 2018 (the cut-off point in Ofcom's data as in Figures A21.9 and A21.10).

2.83 We note that Ofcom should increase its risk-free rate estimate from -1.25% to 0.0% (see paragraph x). Because the cost of new debt is estimated as the sum of the risk-free rate and the debt premium, an increase in the risk-free rate would increase Ofcom's cost of new debt estimate from 2.9% to 4.2%.[31] Consequently, Ofcom's overall cost of debt estimate would also increase from 4.0% to 4.2% (once the cost of existing debt is also taken into account).

[31] Cost of new debt = Nominal risk-free rate + Debt premium. The nominal risk-fee rate equals the sum of the real-risk free rate of 0% and the RPI inflation estimate of 2.9%. The debt premium equals 1.3%, based on Ofcom's estimate. Source: A21.77.

A3 Regulation of BT core nodes (A3)

3.1 This Annex raises a number of specific issues important to BTs downstream business units:

- A pragmatic solution is needed to avoid the regulation of some core connections that were not regulated under the 2017 Legal Instruments.[32]
- Cablelink data provided by BT appears to be missing from Ofcom's geographic market analysis, likely resulting in the unnecessary regulation of a number of BT exchanges and we ask Ofcom for a re-assessment using the best available data to correct for this.
- The proposed re-regulation of a number of exchanges since the Temporary Statement is inconsistent with the threshold for regulation having changed from three to two Principal Core Operators (PCOs). We are asking that – where work has begun on building connectivity to these exchanges – these circuits should be exempted from the proposed re-regulation.
- BT understands that under Ofcom's proposals, connections between BT exchanges and non-exchange buildings would not be regulated as they are not listed in Schedule 6. We would welcome Ofcom's confirmation that under its proposals regulation would not apply to connections between BT exchanges and buildings not listed in Schedule 6.

A pragmatic solution for core connections not regulated under the 2017 Legal Instruments

3.2 Ofcom have taken an exchange based approach to geographic market definition of the inter-exchange connectivity market.

3.3 As Ofcom state in paragraph 3.13 of the Consultation, demand for interexchange connectivity '*comes from telecoms operators that need to carry aggregated traffic between BT exchanges to reach their own network*'[33]. This approach to market definition does not capture core connections[34] accurately. If implemented it would adversely impact BT's existing core network significantly, without bringing any benefits to CPs. As explained in more detail below, this is because:

- Firstly, CPs generally do not require access to BT core nodes or connections as they backhaul traffic to their own core network;
- Secondly, non-BT CPs do not locate core nodes within BT exchanges and so cannot derive benefit from the proposed regulation of some BT core connections; and

[32] Ofcom, Business Connectivity Markets, Temporary SMP Conditions in relation to business connectivity services, 23 November, 2017

[33] BCMR 2018 Consultation, para 3.13

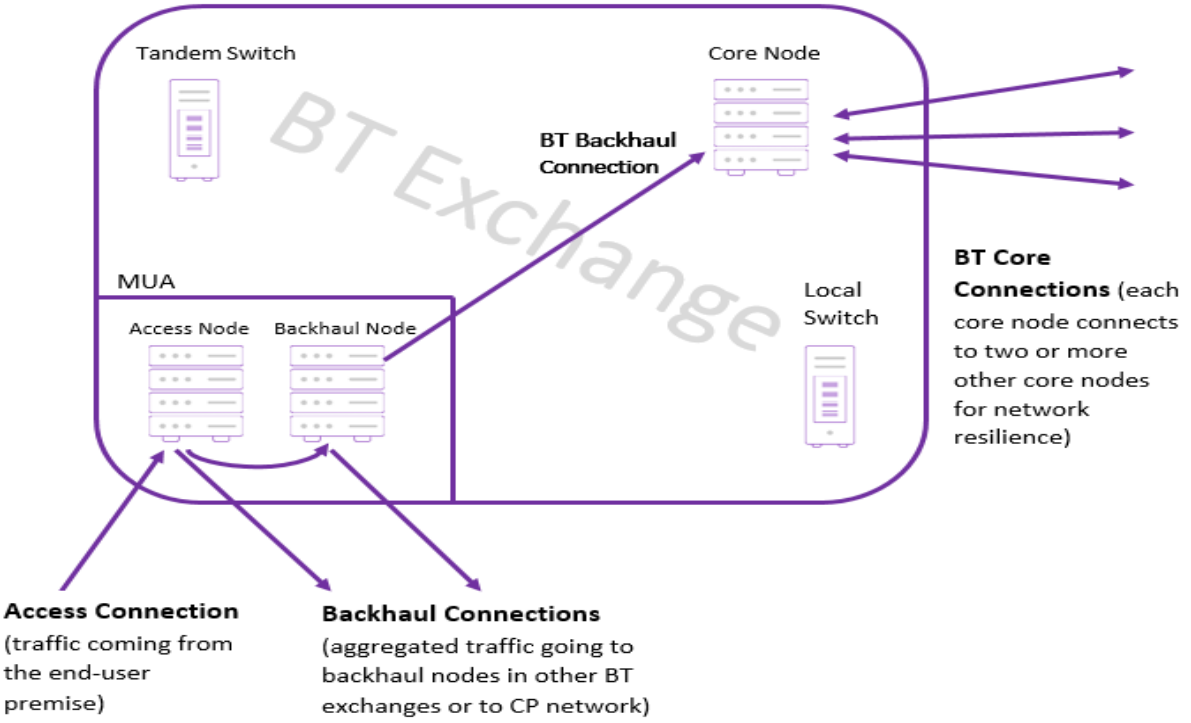
[34] BCMR 2018 Consultation, para 3.7 '*Core connections (and nodes) may transport more communications services due to aggregation of backhaul traffic and generally have higher capacity than backhaul connections (and nodes). Core nodes are typically located in a city of significant population within 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.*'

- Thirdly, regulation of these core connections would cause significant network disruption and reduce the reliability of BT's core network.

3.4 Ofcom's approach assumes CPs '*need to carry aggregated traffic between BT exchanges to reach their own networks*'[35]. In practice, CPs do not need access to the whole exchange to backhaul aggregated traffic - they only require access to the multiple user area (MUA).

3.5 As Ofcom acknowledge[36], where there is SMP, CPs rely on Openreach regulated products to backhaul aggregated traffic to their own core network from BT exchanges. CPs therefore only require access and backhaul connections in order to aggregate traffic from the end-user's premise to their own network – all of which is contained in the MUA.

Figure 2.1: Stylised illustration of the topology of a BT



3.6 Figure 2.1 above shows that the topology of the exchange is far more complex, with BT core nodes, local switches and tandem switches all co-located in the exchange, along with the MUA.

3.7 BT core nodes are located elsewhere in the exchange, not in the MUA. Non-BT CPs do not get, nor require or benefit from, access to BT core nodes and thus BT's core connections because CPs do not require access to BT's core network (and if the relevant exchange is regulated, can already obtain backhaul on regulated terms from Openreach from the MUA[37] as shown in figure 2.1).

[35] BCMR 2018 Consultation, para 3.13.
[36] BCMR 2018 Consultation, para 7.7.
[37] BCMR 2018 Consultation, para 7.41.

3.8 Therefore some BT core connections have become regulated simply because they are co-located in an exchange where PCOs have little or no backhaul presence rather than on the basis that the core connections themselves are in demand and uncompetitive.

3.9 We believe that at least [✂][38] core nodes could become subject to SMP regulation under Ofcom's proposals for the Inter-exchange connectivity market. Table 2.2 sets out the list of core nodes that either historically had an exemption from an equivalence of input (EOI) obligation (Core Nodes) or were deemed to be competitive under the previous market review (Competitive Core Nodes). Under Ofcom's proposals in this BCMR, it appears that core nodes that were previously exempt from EOI[39] could now be subject to this obligation and core nodes previously deemed to be competitive could now be regulated.

Table 2.2: BT Exchanges where increased regulation is proposed compared to the 2017 Temporary Statement[40]

[✂]

3.10 The regulation of connections between BT core nodes would require BT to unnecessarily re-engineer parts of its core network to consume Openreach inputs, increasing [✂]. Ofcom has not identified any customer or competitive benefits of imposing such a requirement. As connectivity between these and other BT core nodes has never been subject to regulation, BT has designed its core network to create product characteristics that cannot be replicated using current Openreach products. [✂].

3.11 BT core nodes have been located in exchanges to give maximum geographic coverage and to maintain high levels of service availability to all regions of the UK – for example by providing [✂]. Regulating BT's core nodes would have impact beyond these nodes themselves, driving re-engineering of core network connectivity and [✂]

3.12 In addition, Ofcom's proposals would mean that BT's core network would have to use two management systems; one for BT and one for Openreach. This will unnecessarily complicate fault management of BT's core traffic.[41]

3.13 We believe that a pragmatic solution is possible. In previous market reviews, Ofcom have provided BT with an exemption from EOI obligations for core nodes that did not fall within the deregulated Competitive Core Market[42]. This enabled BT to operate a core network without a requirement to consume Openreach inputs. A similar approach

[38] We note that core nodes at [✂] have been included as uncompetitive exchanges despite not being exchanges. Including these, we believe [✂] core nodes could be re-regulated.

[39] Following the removal of the exemption from the legal instruments: Condition 4.2 of the 2017 BCMR Legal Instruments includes reference to a specific exemption for core connections which is not included in the 2019 BCMR Legal Instruments.

[40] As set out in Ofcom's 'Business Connectivity Markets, Temporary SMP conditions in relation to business connectivity services' (23 November 2017). Annex 1, Schedule 20 (Core Nodes) and Schedule 22 (Competitive Core Node).

[41] Because Openreach inputs would be fault managed by Openreach systems and not BT systems, BT would not have end-to-end visibility of its core network and this would result in such complexity when fixing faults.

[42] As detailed in the BCMR 2016 Legal Instruments, 4.2 (b), p16 '*The obligation in Condition 4.1 to provide network access on an Equivalence of Inputs basis shall not apply to: (b) a Backhaul Segment connecting:(i) the operational building of the Dominant Provider which is a Core Node and another Core Node;*
(ii) the operational building of the Dominant Provider which is a Core Node and a Competitive Core Node; or
(ii) two operational buildings of the Dominant Provider within a Trunk Aggregation Node;'

that extends to include the 'Competitive Core Nodes' that now sit in uncompetitive exchanges should be adopted again. This would ensure BT will not need to consume Openreach inputs for its core connections. Ofcom could adopt a similar and pragmatic solution in this review. We ask that Ofcom continues its previous approach and does not require BT to consume Openreach backhaul products for core connections between existing BT core nodes.

3.14 This will enable BT to continue to provide a highly resilient and flexible core for its customers and end-users without affecting Ofcom's objective of providing greater backhaul competitiveness. CPs would not be disadvantaged by this as they would still be able to buy connectivity to their own network as Openreach would continue to be required to make available the appropriate backhaul product.

Missing Cablelink data

3.15 Ofcom has confirmed that both direct and indirect connections provide sufficient constraint on BT, and therefore will impact the competitive status of an exchange. Ofcom note that '*telecoms providers purchasing External Cablelink variants are doing so to connect to PCO's network to receive an interexchange connectivity service'*[43].

3.16 In a statutory information request dated 14 September 2018, Ofcom requested further information on BT's provision of external Cablelink variants. In our response dated 21 September 2018, BT reported sales of a significant number of Cablelink circuits to PCOs, which are connected to a fibre supplied by the PCO.

3.17 We have identified that for 4 exchanges listed in Schedule 6 as 'BT only' exchanges BT in fact supplied Cablelink circuits to other PCOs. As a result we believe Ofcom's analysis underestimates the PCO presence at BT exchanges and it is essential that Ofcom updates its model for its final decision[44]. We are asking Ofcom to include this information in its analysis and expect it to lead to a small but significant number of exchanges being reclassified.

3.18 Finally, we believe Ofcom has used MDF identifiers ('ID') as references to buildings. However an MDF ID references an MDF within a building and there could be more than one MDF in a building. This therefore means there is no clarity as to whether an exchange is deregulated or not in some buildings where there are multiple MDFs. For example, [✂] MDFs are housed in the same building. However, Ofcom's list of exchanges only includes [✂] and not [✂]. It would be helpful if Ofcom could clarify that its intention is that list refers to the whole BT building/site with both exchanges, and not just the part of the building dedicated to serving the Roath area (in this example).

[43] BCMR 2018 Consultation, para 7.53.

[44] In Annex 15 of the BCMR 2018 Consultation Ofcom state their intention to gather more information from purchasers of external cablelink and BT Egress and this may change the number of BT exchanges subject to regulation.

Proposed re-regulation of exchanges since the Temporary Statement

3.19 There are a number of exchanges where, in the 2018 BCMR consultation[45] Ofcom proposes BT has SMP while, in the 2017 Statement[46], Ofcom found these same exchanges to be competitive; this despite the fact that Ofcom proposes to change the threshold for regulating exchanges from BT+3 Principal Core Operators ('PCOs') in the 2017 Temporary Statement to B+2 PCOs in the 2018 BCMR consultation. While we agree that the threshold of BT+2 is likely a better reflection of competitive constraints than that applied previously, it is difficult to understand how a lower threshold could result in re-regulation of some exchanges.

3.20 Ofcom's proposals have an adverse impact on BT's core network build as BT has already begun to build to these exchanges using core connectivity for new services[47] and some of this is near completion. The lead time to convert this to an Openreach backhaul based solution will result in delays.

3.21 As outlined above, a pragmatic solution is possible. We believe that where deregulation under the 2017 Statement has led to increased core build to those sites, such connections should also be exempt from EOI obligations.

The status of connections to and from nodes and buildings that do not fall within Schedule 6

3.22 Ofcom have confirmed in its consultation document that the purpose of the inter-exchange market assessment is to establish which connections between BT exchanges are not competitive[48]. This is reiterated in Ofcom's clarification on 19 December 2018, which confirms the dark fibre remedy would only apply to backhaul connections linking BT only exchanges to other BT exchanges.

3.23 BT understands that under Ofcom's proposals, connections between BT exchanges and non-exchange buildings would not be regulated as they are not listed in Schedule 6. This is relevant to BT as a number of EE core nodes and BT operational buildings[49] do not fall within the Schedule 6 list of exchanges. These BT and EE buildings are not exchanges, and they do not contain an MUA area, nor frame to which other CPs would need access to aggregate and collect traffic.

3.24 We would welcome Ofcom's confirmation that under its proposals regulation would not apply to connections between BT exchanges and buildings not listed in Schedule 6.

[45] BCMR 2018 Consultation, table 7.6.
[46] Ofcom, Business Connectivity Markets, Temporary SMP Conditions in relation to business connectivity services, 23 November, 2017, Legal Instruments, Schedule 20.
[47] [✂].
[48] BCMR 2018 Consultation, para 7.41.
[49] As well as all non-BT CP sites.

A4 Data Centres (A4)

4.1 We welcome Ofcom's proposal to deregulate connections between the nodes of third party CPs, carrier owned data centres as well as carrier neutral data centres, but would welcome further clarification on the definition of a data centre and the precise scope of deregulated circuits.[50]

4.2 The list of data centres Ofcom published on 22 December 2018 contains over 900 data centre locations upon which its analysis was based. We understand that this list represents all data centres which Ofcom consider to be competitive.

4.3 We request clarification that under Ofcom's proposals:

- Any connection between a data centre and any BT exchange would not be subject to SMP regulation;
- Any connection between two data centres would not be subject to SMP regulation; and
- Any connection between a data centre and a customer site (which is not a datacentre or exchange) located in an area where Ofcom is proposing to find SMP in the (proposed) business access market would be subject to SMP obligations (and considered as part of the business access market).

4.4 We also note that Ofcom's proposed legal instruments do not contain any references to data centres. For the avoidance of doubt, it would be helpful if the legal instrument made clear which specific types of connections (as per our request for clarification above) are consider to be competitive and therefore not subject to SMP regulation.

[50] BCMR 2018 Consultation, para 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 …'.*

A5 Deregulation of Traditional Interface Services (A5)

5.1 We agree with Ofcom that the time is right to deregulate legacy Traditional Interface (TI) services. Volumes on the platforms[51] supporting TI services are declining rapidly and maintenance costs rising as platform equipment becomes obsolete. There will come a time when it is no longer sustainable to continue to provide these services, and deregulation is key to allowing a timely managed closure of the underlying platforms.

5.2 In this annex we set out why we support Ofcom's proposals and provide evidence to support its conclusions.

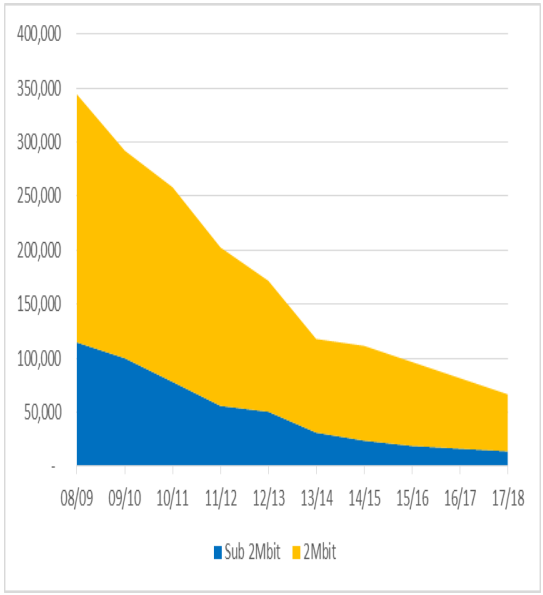
The market for legacy TI services is in long term decline as customers migrate on to more modern alternatives

5.3 Demand for legacy TI services has been in long term decline, with volumes falling by around 80% over the past decade. This trend has continued since Ofcom's last market review. Today, internal BT volumes account for the majority of the market. Figures 4.1a and 4.1b below shows the decline in TI Local Ends from 230K in 2008/09 to 53K in 2017/18 (corresponding to a 16% decline per year over the period).

Figure 4.1: Volumes of low bandwidth PPC Connections and Local Ends

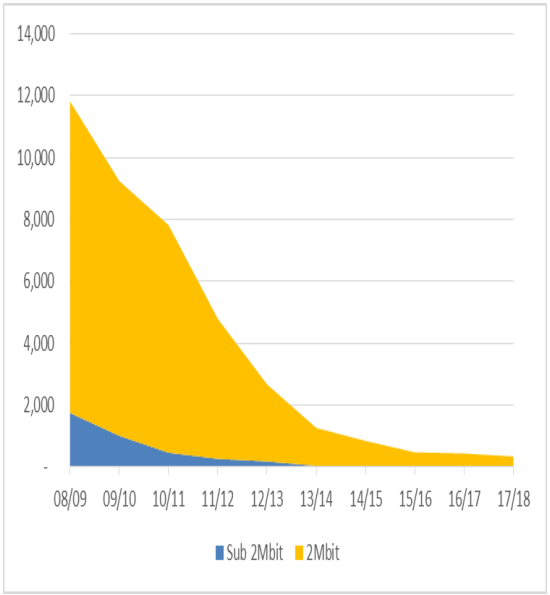
4.1a

Low Bandwidth TI Volumes*



4.1b

Low Bandwidth TISBO Connections Volumes



*PPC Local End volumes

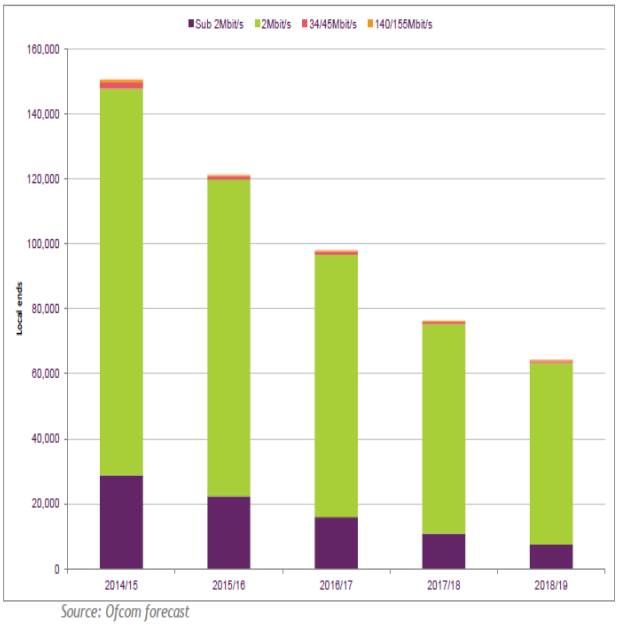
[51] SDH and PDH platforms

5.4 This is in line with Ofcom's forecast set out in its 2016 review, as illustrated in Figure 4.2, and we expect volumes to continue to decline by a further [✂] over the next review period.

Figure 4.2: Comparison of Ofcom forecasts to BT actuals for TI local ends

4.2a[52]

Figure 6.3: Ofcom forecast of TI local ends (installed base by bandwidth)



Source: Ofcom forecast

4.2b

BT actuals for TI local ends (installed base by bandwidth)

[✂]

5.5 The long term decline in the legacy TI platform has been driven by businesses switching to newer alternative technologies which offer lower transport costs, greater flexibility and are often required for new applications. Since Ofcom's last market review, TI customers are now provided with a number of viable alternatives as fibre and Ethernet rollout have become increasingly ubiquitous. FTTP build is likely to continue this trend.

5.6 Additionally, price reductions for Ethernet services have substantially reduced previous price differentials, making switching to Ethernet based services more economically viable. Table 4.3 below sets outs a comparison of the key characteristics of alternatives to a PPC now available.

[52] BCMR 2016 Statement, Volume 2, pg. 142.

Table 4.3: Available alternatives to low bandwidth PPCs

	PPC[53]	*Point- to Point Ethernet (carrier class)[54]*	*National Ethernet Fibre[55]*	*National Ethernet EFM/ GEA[56]*	*Broadband Access (FTTC)[57]*	*Broadband Access (FTTP)[58]*
Contention	Dedicated	Dedicated	Dedicated	Dedicated	Shared	Shared
Distance Limitations	Not Limited	Not Limited	Not Limited	Not Limited	Not Limited	Not limited
Service Availability	99.85%	99.93%	99.93%	99.93%	N/A	N/A
Coverage	99%	99%	99%	EFM 82% GEA 73%	73%	2.83%
Symmetry	Symmetric	Symmetric	Symmetric	Symmetric	At least 2M each way	At least 2M each way
Price	£2,800	£3,498	[✂]	[✂]	£228	£228
Connection	£2,217	£1,850 (£656)	[✂]	[✂]	£54	£104

5.7 While many customers are migrating onto more modern alternatives, those that remain on TI services will be supported by an increasingly ageing platform. The PDH and SDH platform is now used to support only a few 'soon to be withdrawn' services, i.e. PSTN voice and 20C broadband services, in addition to TI services.

5.8 As the platform ages and use of it declines, it is vital to have a clear, managed closure plan that encourages any remaining customers to migrate to alternatives. These platforms are over 30 years old, and sourcing equipment and spare parts for maintenance is becoming increasingly difficult. Significant work is also required to re-engineer existing components to repair and extend their usability.

5.9 Additionally, employees with expertise of the SDH and PDH platforms are at the end of their careers and are now retiring. It is no longer economic to continue to train engineers to manage these services given the decline in usage and that the majority of demand is for newer services.

5.10 At the same time, as costs are not falling in line with declines in volume, unit costs are expected to rise. Figure 4.4 below shows how the rate of decline in TI costs and revenues have fallen between 2014/15 and 2017/18.

Figure 4.4: SDH and PDH platform revenues and costs

[✂]

[53] PPC based upon 2km main link distance (MLD) (current average MLD across installed base – 15km terminating, 4km regional trunk, 2km national trunk)

[54] Point to point EAD assumes 10km MLD excludes connection charge £1,925.

[55] National Ethernet Fibre assumes 2Mbit/s on 100M LA Etherway (3 year term free connection)

[56] EFM assumes 2 Mbit/s on 3 pairs (3 year term free connection); GEA 2Mbit/s on 80:20 Etherway

[57] Broadband Access typical bandwidth inclusive price offered by BT Enterprise is £18-20 per month with Openreach 80/20 rentals at cost of £9.95 per month

[58] For the transition variant of FTTP with Openreach 80/20 rentals at cost of £9.95 per month- Coverage source think broadband for Openreach https://labs.thinkbroadband.com/local/uk

5.11 Whilst variable costs have fallen in line with volumes, fixed costs remain high and are likely to increase further as legacy equipment and expertise become increasingly scarce; costs are becoming increasingly sticky as volumes drop.

5.12 In short, increasing fixed cost must also be shared by a diminishing customer base, as TI customers continue migrate onto other services and PSTN and legacy broadband services are withdrawn. Whilst we do not want customers to experience price shocks, we nonetheless need the flexibility to recover legacy network costs and manage the transition to alternatives.

5.13 Figure 4.5 below shows the trend in BT's returns (ROCE) for the period 2014/15 to 2017/18 alongside Ofcom's forecasts when setting the current charge control. This shows BT's returns to be in line with Ofcom's forecasts and we expect this trend to continue.

Figure 4.5: BT Return on Capital Employed ('ROCE') compared with Ofcom's forecast

[✂]

5.14 With modern alternatives now more widely available at similar prices, we expect customers continue to migrate way from TI services for their business connectivity needs. Continued regulation of the SDH and PDH platform would likely result in artificially maintaining demand for TI services, keeping the network running long past its natural lifespan, impacting reliability and cost efficiency. Therefore we agree with Ofcom that regulation is no longer warranted or justified and support Ofcom's proposal to deregulate TI services.

5.15 To provide existing TI customers with confidence in BT's long term plans, we have made a number of assurances on the future availability, reliability and price of TI services in a letter to Ofcom[59]. In it, we set out the need for a pragmatic regulatory approach in this area and put forward assurances on availability, reliability and price:

- **Availability** – we are committed to continuing to support TI services until March 2021 subject to demand and will provide customers with sufficient notice of withdrawal ahead of a planned 2025 platform switch-off;
- **Reliability** – we will continue to support the platform on a reasonable endeavours basis in order to meet service delivery and quality requirements as set out in PPC contracts;
- **Price** – We would not expect to increase prices by more than CPI+8% per annum to reflect increasing costs. This pricing flexibility will enable BT to cover its costs while also creating the right incentives for customers to migrate.

Ofcom's conclusion that the TI market does not pass the three criteria test is consistent with the approach taken by other NRAs

5.16 We agree with Ofcom's assessment that the market no longer passes the three criteria

[59] Letter from Gerry McQuade to Jonathan Oxley, 3 July 2018 – https://www.ofcom.org.uk/__data/assets/pdf_file/0021/124734/bt-low-bandwidth-wholesale-ti-services.pdf

test, and believe that this is consistent with the approach taken by other national regulatory authorities (NRA) across Europe.

5.17 Estonia, Hungary, Sweden and Austria have all de-regulated low bandwidth TI services on the basis that alternative infrastructures provide sufficient constraint, thus tending towards effective competition. Specifically, the Estonian regulator (ETSA) found that many low bandwidth leased lines users are switching to broadband inputs[60]. Similarly the Hungarian regulator (NMHH) found that effective competition did not stem from a change in market share but from the decreasing average price of higher bandwidth alternatives[61].

5.18 With TI services in the UK experiencing similar constraints from Ethernet alternatives, we agree with Ofcom's assessment that the TI market fails the second criterion of the three criteria test, tending towards effective competition.

[60] EC's comments pursuant to Article 7(3) of Directive 2002/21/EC – C(2014) 9845 – EE/2014/1675

[61] Opening of Phase II investigation pursuant to Article 7 and Article 7a of Directive 2002/21/EC as amended by Directive 2009/140/EC – C(2018) 6084 – HU/2018/2107

A6 Responses to Ofcom's consultation questions and cross references

The following provides cross-references to the relevant parts of the main document in the BT Group response to the PIMR and BCMR ('Main Document'); as well as to the (separate) Openreach responses to the BCMR and PIMR consultations where relevant, that answer Ofcom's question.

Physical Infrastructure Market Review

3.1 Do you agree with our proposed market definitions? We do not agree that there is an economic market in '*telecoms physical infrastructure used to host fixed elements of a network*' given that other physical networks are, and can be used for this purpose, and that the Access to Infrastructure regime is due to be enhanced in 2019 which will increase their availability in future. Such networks can substitute for telecoms networks and therefore ought to be included in the market. See also chapter 2 in the Main Document as well as the Openreach response to the PIMR consultation.
3.2 Do you agree with our proposed SMP assessment? We do not agree with Ofcom's SMP assessment which not only excludes substitution from non-telecom physical infrastructure but also fails to recognise the extent of competition from existing telecom physical infrastructures, whether from Virgin Media or other end-to-end competitors active in HNR areas including the CLA. BT should not be deemed to have SMP in an upstream market where there is no SMP in the absence of the PIA remedy under consideration. In view of this, we do not agree that BT has SMP which justifies UDPA in the CLA at all; and in HNR areas at least for VHB services. See also chapter 2 in the Main Document as well as the Openreach response to the PIMR consultation.
4.1 Do you agree with our proposed general remedies? See chapter 2 of the Main Document and the Openreach response to the PIMR. See also chapter 2 in the Main Document as well as the Openreach response to the PIMR consultation.
5.1 Do you agree with our proposed specific remedies? See chapter 2 of the Main Document and Openreach response.
5.2 Do you agree with our assessment not to impose a dark fibre backstop remedy in this review period? Yes. Introducing regulated dark fibre today is likely to deter investment and innovation rather than support it. Duct and pole access should be allowed to play out before Ofcom even consider imposing a dark fibre remedy as it is likely to undermine the investment duct and pole access is intended to incentivise. See Main Document to the BCMR (chapter 5) and the Openreach response to the PIMR.
6.1 Do you agree with our proposal regarding the level of the financial limit?

See chapter 2 of the Main Document to the PIMR and BCMR and the Openreach response to the PIMR on this question.
6.3 Do you agree with our proposed approach to the recovery of productisation costs? See the Openreach response to the PIMR.
7.1 Do you agree with our proposed approach to regulation of PIA charges? We accept the continuation of prices as set in the 2018 for the next two years. However, a long-term view is needed of the sustainability of duct and pole pricing as demand from new network operators increases as is likely in the period beyond 2021. This should ensure that whatever happens to Openreach's share of active services, there should be a fair opportunity for Openreach to recover the efficiently incurred costs of providing shared access to its physical infrastructure. This is a principle that Ofcom should state up-front so that DPA access takers are aware that the regime operates in this way. See also chapter 2 of the Main Document and the Openreach response to the PIMR.

BCMR: Volume 1

4.1 Do you agree with our proposed approach to product market definition? We do not agree with Ofcom's approach to product market definition as set out in chapter 3 of the Group response to the PIMR and BCMR and in greater detail in the Openreach response to the BCMR.
5.1 Do you agree with our proposed approach to geographic market analysis for CI Access? See above.
5.2 Do you agree with our proposed definition of geographic markets for CI Access? See above.
6.1 Do you agree with our proposed approach to SMP assessment for CI Access in the UK excluding Hull Area? See above.
6.2 Do you agree with our proposed SMP findings for CI Access in each of the geographic markets defined? See above.
7.1 Do you agree with our assessment of inter-exchange connectivity? See Annexes 2 and 3 above and the Openreach BCMR response.
7.2 Do you agree with the proposed market definition? See Openreach BCMR response.
7.3 Do you consider that our list of BT exchanges for de-regulation is correct? See Annex 2 above.
7.4 Do you agree with our list of Principal Core Operators (PCOs)?

See Openreach response to the BCMR.
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 European Commission Recommendation? We agree with Ofcom's assessment that the market no longer passes the three criteria test. This is consistent with the approach taken by other national regulatory authorities (NRA) across Europe.
10.1 Do you agree with our proposed approach to remedies? See chapters 3, 4 and 5 of the Main Document and the Openreach response to the BCMR.
11.1 Do you agree with the general remedies that we propose? As above.
12.1 Do you agree with the aims and effect of our proposed dark fibre remedy? As above.
12.2 Do you agree with our proposed scope of the remedy? As above.
12.3 What scope do you expect to have for cost savings as a result of the proposed dark fibre remedy? See chapter 5 of the Main Document and the Openreach response to the BCMR.
12.4 How many orders for dark fibre would you envisage placing during the two-year period? See Openreach response to the BCMR.
12.5 Do you agree with our proposed timeline for dark fibre implementation? See Openreach response to the BCMR.
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? See chapters 3, 4 and 5 of the Main Document to the PIMR and BCMR and the Openreach response to the BCMR.
14.1 Do you agree with the specific remedies for interconnection and accommodation that we propose? See Openreach response to the BCMR.
15.1 Do you agree with our proposals regarding the application of QoS standards, KPIs, SLAs and SLGs over the period of this review? We welcome Ofcom's decision to review Openreach QoS obligations. It is important that these services standards are scrutinised and remain appropriate for industry. We broadly agree with Ofcom's QoS proposals for the next review period and believe that on the whole they will help to support service delivery to our customers subject to the specific issues Openreach raised in its response to the BCMR consultation. Obligations set out in the last market review have contributed to a step-change improvement in Openreach service level performance. BT customers prioritise service

delivery over compensation, and therefore our focus remains on improving how well we deliver services rather than compensating customers when things go wrong. For BT therefore it is vital that any measures imposed on Openreach are clear, effective and drive the correct behaviour both within Openreach and the industry.

Ofcom's has set out guidance for future negotiation of SLGs in paragraph 15.185 of the Consultation. We are pleased to see this as it provides much needed clarity on costs, such as brand damage, that have previously been in contention due to their intangible nature.

In principle, BT does not believe higher levels of SLGs are effective at improving Openreach service delivery performance. Rather it incentivises gaming of the system. Therefore it is important that the SLGs are not set at too high a level and that only the essential costs are included in setting them.

BT would like to see a number of additional new measures introduced by Openreach to improved visibility and clarity of Openreach delivery. These have been raised at the Ethernet Service Forum:

- "**Radio Silence" reports.** These would give us a meaningful update every 10 days from Openreach. The current set of measures for KCI2/3 on legacy and the equivalent on EMP 1.2/2 currently has a pass or fail measure in place. Once an order has failed there is no measure of by how long this has failed by, so in some cases this could be 2 hours in others 2 months. Adding a continuous cycle time type measure to this would give us a more informed view as to whether remedial action is needed by Openreach.
- **The Stand-alone survey (SAS).** This is a particularly important issue for BT as we use these regularly. Stand-alone survey gives CPs an option to instigate a planning survey by Openreach ahead of a circuit order being placed. If the SAS process has already been used to assess the requirements of the site and planning activities completed, we think it is reasonable for a live order to be expedited through the order process.

16.1 Do you agree with the remedies in the Hull Area that we propose?

NA

BCMR: Volume 2

2.1 Do you agree with the proposed form of charge controls?

See chapter 4 of the Main Document and the Openreach BCMR response.

3.1 Do you agree with each of our proposals in relation to the design of charge controls for active services at 1 Gbit/s and below?

See chapter 4 of the Main Document and the Openreach BCMR response.

3.2 Do you agree with each of our proposals in relation to the design of charge controls or active VHB services?

See chapter 4 of the Main Document and the Openreach BCMR response.

3.3 Do you agree with each of our proposals in relation to the design of charge controls for accommodation services, Excess Construction Charges and Time Related Charges?

See chapter 4 of the Main Document and the Openreach BCMR response.

4.1 Do you agree with our proposals in relation to the design of a charge control for inter-exchange dark fibre? See chapters 4 and 5 of the Main Document and the Openreach BCMR response.
5.1 Do you agree with each of our proposals in relation to the implementation of charge controls? See chapter 4 of the Main Document and the Openreach BCMR response.