openreach

Openreach's response to Ofcom's consultation "Business connectivity market review – Volume 1: Market analysis, proposed SMP findings and remedies"

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Foreword

On 2 November 2018, Ofcom published a consultation on the Business Connectivity Market Review (BCMR) setting out its proposals for the regulation of leased lines during the two-year period from April 2019 to March 2021.

In response to stakeholder queries, Ofcom later published, on 19 December 2018, a second version of the consultation to correct and clarify the inter-exchange dark fibre charge control model and scope of the remedy and to make minor corrections to the 2 November document.

This document represents the response from Openreach on the proposals in Volume 1 of the consultation relating to market analysis, proposed SMP findings and remedies, with the exception of the proposals for Quality of Service remedies, which are set out in a separate response. We have also provided a separate response on Ofcom's charge control proposals in Volume 2 of the consultation.

We note that the response date for Ofcom's consultation on the Physical infrastructure Market Review (PIMR) has been put back to Friday 1 February 2019. We reserve the right to amend or supplement this response to reflect any developments in our response to that consultation, given the close linkages between the two reviews.

Openreach is a wholly-owned subsidiary of BT looking after the fibres, wires and cables that connect tens of millions of homes and businesses to phone, broadband, and TV. We have our own Board, separate brand and 31,000 strong independent workforce, including the largest team of fibre broadband engineers in the country.

1. Executive summary

1. The proposed BCMR framework set out in Ofcom's consultation published on 2 November ("the Consultation") and revised on 19 December 2018 is intended to bridge the two-year gap between the expiry of the Temporary Conditions[1] on 31 March 2019 and the coming into force of Ofcom's new long-term regulatory approach in April 2021.[2] Under this approach, the BCMR and the Wholesale Local Access market review will be replaced by a new Integrated Market review covering both business and consumer markets and based on a five-year cycle rather than the three-year cycle in the current framework.

2. Openreach broadly supports the proposals in the Consultation taken as an overall package. In particular:

   - We agree with the proposals for lighter charge controls based on safeguard caps or fair and reasonable pricing for active services. We have been obliged to make significant price cuts on these services each year since 2013, and continuing on that path would be unsustainable and incompatible with Ofcom's aim of supporting investment. Keeping prices stable over the period to March 2021 strikes the right balance between protecting consumers from high prices, while allowing Openreach the opportunity to recover its efficiently incurred costs, and providing certainty and stability as we transition to the future regulatory framework;[3]
   - We support Ofcom's proposal that connectivity on routes between 545 BT exchanges and all carrier owned and carrier neutral data centres should be deregulated rather than as today, when there is no SMP regulation on connectivity between 56 Trunk Aggregation Nodes, 107 additional exchanges and 64 specified carrier neutral data centres only. This better recognises the extent of competition in connectivity across core networks than the current framework;
   - The proposed framework for quality of service remedies is broadly realistic and in line with the much improved standards of service that Openreach now delivers. We also agree that quality of service regulation is not needed in the High Network Reach areas[4] outside the Central London Area ("CLA") as well as in the CLA itself.

3. At the same time, there are aspects of Ofcom's proposals which we would urge Ofcom to amend to ensure that the framework in the transitional period to 2021 is proportionate, does not have unintended consequences and sets regulation on the right course for the future framework. These are summarised below and set out in more detail in the relevant sections and annexes in this response.

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1 Business connectivity markets are currently regulated under the Temporary Conditions set out in Ofcom's Statement published on 23 November 2017 at https://www.ofcom.org.uk/__data/assets/pdf_file/0019/108019/BCMR-Temporary-Conditions.pdf

2 This approach was set out in Ofcom's Statement "Regulatory certainty to support long-term investment in full-fibre broadband" published on 24 July 2018 at https://www.ofcom.org.uk/__data/assets/pdf_file/0025/116539/investment-full-fibre-broadband.pdf

3 Our comments on Ofcom's pricing proposals are set out in our separate, parallel response to Volume 2 of the Consultation and are not considered further in this response.

4 These are areas where Ofcom assesses that here are at least two network competitors to Openreach. They include the central business districts of Birmingham, Bristol, Edinburgh, Glasgow, Leeds and Manchester.

Inter-exchange connectivity and dark fibre

4. As Openreach has explained in previous Ofcom consultations and in its evidence on previous appeals, we have significant concerns about requiring us to supply dark fibre as a regulated service, and not least about Ofcom's indications that it sees a wider scope for regulating the supply of dark fibre going forward. Dark fibre is commercially available as a product in the market place, but the terms on which it is supplied will be a balance between a range of complex factors relevant to the supplier and the purchaser – e.g. ensuring efficient use of existing fibre strands and deployment of new electronics equipment by the purchaser; ensuring the supplier can fully recover the costs of assets in place and is not left exposed as, for instance, the purchaser rationalises the number of fibre strands it utilises; etc.

5. It is notable that the proposed terms on which we would be required to supply dark fibre as a regulated service bear no relation to the terms that are negotiated commercially and understate or overlook the complexities that arise in unbundling existing services in this way. They therefore risk damaging cost recovery, investment incentives and economic efficiency. Rather than supporting investment in networks to extend customer choice, introducing regulated dark fibre could have the effect of deterring investment and innovation.

6. In particular, we consider that Ofcom's proposal for imposing a dark fibre access remedy in wholesale market for inter-exchange connectivity is flawed for a number of reasons:

   a. The market definition and SMP assessment on which the imposition of the remedy relies are unsound and out of line with accepted methodologies. In particular, the market is defined such that it only covers Openreach's network, and not the much wider backhaul market on which the remedy would have a direct impact. Market shares are not taken into account in the assessment of market power. There are also a number of errors in the analysis which need to be corrected.

   b. The proposed remedy is inappropriate and disproportionate. Ofcom has overstated the benefits of the remedy and understated the risks:

      i. As currently drafted, there are no real limitations on the scope of the remedy. This means it would be open to misuse (obliging Openreach to provide dark fibre on in excess of 12 million possible routes spanning the UK). This, combined with the very low prices proposed by Ofcom, would have a serious and destabilising impact on the industry and investment in new networks and would undermine investment in competitive core networks.

      ii. Ofcom has not properly taken into account the potential impact of Duct and Pole Access ("DPA"), including the unrestricted version which Ofcom proposes should be available from around spring 2019.

      iii. Openreach and other industry participants have been investing and will continue to invest in active networks. These investments are based on business cases which require full recovery of the costs of passive fibres and electronics and on assessments of future demand for bandwidth and service quality and other customer requirements. The threat of regulation unpicking those investments and requiring Openreach to supply passive-only services will act as an undesirable constraint on innovation and investment, contrary to Ofcom's general objectives.

      iv. The remedy is focused on smaller exchanges which are likely to be closed in the transition away from legacy networks and services over the coming years. The remedy appears primarily aimed at providing low cost backhaul to LLU operators. This runs counter to Ofcom's and Government's

ambition of supporting full fibre-roll, as the predominant impact is likely to be to encourage prolonged LLU investment.

v. The proposed pricing of dark fibre access will discourage new investment, both from other infrastructure providers and Openreach, where exchanges do not yet have fibre and from those where fibre has been exhausted.

vi. The proposed pricing structure would make a bandwidth gradient for active services impossible. This would remove the commercial flexibility currently available to Openreach to set prices to efficiently recover its costs whilst maximising output.

c. The one-month implementation timescale is not achievable, since it does not allow sufficient time for the industry negotiation and systems development and implementation that would be required prior to launch. The proposed remedy is different to Ofcom's previous proposals for dark fibre, and Openreach would not be able to simply re-use the product specifications and processes developed for the 2016 BCMR.

d. The revised Legal Instrument does not reflect Ofcom's proposals as explained in the Consultation. This is not satisfactory given that the Legal Instrument is the actual measure upon which Ofcom is consulting and will impose legally binding obligations.

7. Our views on the proposed dark fibre remedy are set out in Section 2 and Annexes A-C of this response. For the reasons summarised above, we consider that it is not appropriate or proportionate to impose a dark fibre access obligation at all. Further, the design of the remedy that Ofcom is currently proposing is particularly harmful, in that:

a. The scope of the remedy is not aligned with our understanding of Ofcom's intention and fails to minimise any impacts on fibre investment by Openreach and others;

b. The proposed design of the remedy fails to reflect the topology of Openreach's NGA network rather than the legacy copper network, which will be withdrawn over the coming years;

c. The proposed design fails to minimise inefficient use of fibre and the risks of fibre exhaustion in the future; and

d. Insufficient time is provided for the remedy to be implemented.

8. Even if (contrary to our views on the proportionality of such a remedy) Ofcom were to decide to impose some form of dark fibre access obligation, it would remain possible for Ofcom to reduce the harmful effects arising from the currently proposed design of the remedy (albeit not those which inevitably arise from any dark fibre remedy). In order to do so, i) the remedy must be properly scoped, in the alternative manner set out in paragraphs 85-93 below, ii) errors in the analysis and Legal Instrument would need to be corrected, iii) guidance would be needed on what would constitute a reasonable request for dark fibre and iv) the implementation timescale must be achievable.

9. All of this would mean substantial changes to the proposals for dark fibre that Ofcom has already put forward. In view of this, Ofcom would need to publish a new, separate consultation on this aspect of the BCMR to allow stakeholders the opportunity to comment on the revised proposals. In particular, it is imperative that Ofcom revise the text of the Legal Instrument taking account of the issues identified above so that it accurately reflects Ofcom's stated intention and include the revised text in the new consultation.

10. This would mean decoupling the consultation process, including the 'Article 7' notification to the European Commission, for the proposed remedy from the wider BCMR consultation process. However given that Ofcom does not make a compelling case that there is a material competition problem that dark fibre is needed to resolve, we do not consider this could lead to significant dis-benefits to consumers or other stakeholders.

CI Access market assessment, including impact on Very High Bandwidth ("VHB") services

11. Openreach considers Ofcom needs to reassess a number of aspects of its approach to market definition and SMP assessment in CI Access services. We consider its current approach contains a number of fundamental methodological errors which are biased against Openreach and fail to take account of the guidance in the Competition Appeal Tribunal's (CAT) judgment following BT's appeal of Ofcom's Final Statement in its 2016 BCMR ("the 2016 Appeal"). These errors lead Ofcom systematically to over-regulate Openreach.

12. Openreach is surprised that Ofcom considers it has sufficient evidence to conclude that there is a single product market at all bandwidths. In fact, on Ofcom's own evidence, Openreach considers it is clear that there is in fact a bandwidth break between 1G and VHB services.

13. Geographic analysis is key to the BCMR and also at the heart of Ofcom's future approach to regulation. Ofcom has improved its methodology for geographic analysis over that used in previous BCMRs: for example its network reach assessment now uses duct locations rather than flexibility points. However, it still has key features which lead to the extent of competition being underestimated. For example, postcode sectors where there are competing networks that supply less than 65% of the business sites that meet Ofcom's criteria (sites of businesses with over 250 employees nationally) are classed as 'BT Only', despite the fact that there could be multiple competing networks supplying up to 64% of sites.

14. Ofcom uses a number of unorthodox approaches, in particular the use of CPs' shares of connections in 2017 as the basis for its market power assessment rather than shares of the installed base. We note this is a different approach to the one Ofcom takes in Hull, where it uses the more conventional latter methodology. As a result, the Consultation reaches some conclusions which we consider unsound, including its definition of a single product market covering services at all bandwidths, in which BT[5] has Significant Market Power ("SMP") in all geographic markets except the Central London Area ("CLA") and the Hull Area. This does not take into account the different competitive conditions in particular in very high bandwidth services.

15. Ofcom also takes an unduly conservative approach, with high network reach areas outside the CLA remaining regulated despite i) the extent of competition in these areas resulting from the presence of two or more network competitors to Openreach and ii) DPA, including the unrestricted version which Ofcom proposes should be available from around spring 2019, which would significantly increase viable dig distances.

16. Given there is clear evidence of a bandwidth break between 1G and VHB services, we consider Ofcom's SMP assessment significantly understates the competitive constraints that already exist on Openreach in VHB services. Openreach considers the evidence does not point to it having SMP in the VHB access segment.

17. Even if Ofcom continues to conclude that Openreach does have SMP, Ofcom's remedies should reflect the different competitive conditions in VHB. In particular, this segment is largely based on competitive tenders and the presence of other scale players. Equivalence of Input ("EOI") obligations can be particularly problematic in such a market since such an obligation requires Openreach to offer exactly the same products

[5] Although the relevant services are provided by Openreach, SMP designations are still made against our parent company, BT plc. For this reason, this response contains references to BT as the entity with SMP.

on exactly the same terms and conditions to all customers. EOI obligations can prevent Openreach from complying with certain requirements set down by customers in invitations to tender, make it difficult for us to be able to respond on a level playing field and risk stifling innovation due to difficulties in responding to customers' bespoke requirements.

18. Our comments on CI Access are set out in section 3 and Annexes D-G of this response. Annex G comments specifically on Annex 14 to the Consultation which presents Ofcom's hypothetical SMP assessment for VHB access services. It is especially important that flaws in Ofcom's methodologies are resolved now so that regulation is set on the right course for the future framework that is expected to come into force in 2021.

Quality of service remedies

19. Although we are broadly happy with Ofcom's proposed framework for quality of service remedies, we have issues of detail with some of the specific measures. Our detailed comments on Ofcom's quality of service proposals are set out in our separate response on Question 15.1 which we have submitted in parallel with this response. Looking ahead, our view is that Ofcom should be moving away from detailed quality of service regulation and should be considering alternative, more flexible approaches based more on direct interaction between Openreach and its customers. Our separate response to Question 15.1 considers possible alternatives and invites further discussion on this topic.

General remedy – Equivalence of Inputs ("EOI")

20. Openreach must be allowed to compete fairly in business connectivity markets. However, some aspects of the general remedies that Ofcom proposes could have the effect of constraining pro-competitive behaviour. This applies in particular to the obligations for EOI and the requirement to supply services on fair and reasonable terms.

21. The EOI obligation is intended to address the competition concern that Openreach may supply BCMR services in a way that favours downstream BT Group businesses to the detriment of competitors in retail markets. EOI can directly address this concern by requiring us to ensure any services supplied to downstream businesses are provided on strictly the same terms and conditions to all other downstream providers.

22. However, this requirement should not prevent us from introducing geographically differentiated pricing or competing against new active network providers for wholesale access business, where competition between our downstream business and other retail providers would not be affected.

23. We already face situations where customers are inviting active network providers to bid for the supply of high bandwidth connectivity services under specific terms (e.g. relating to long term certainty of pricing and/or specific service requirements in specific geographic locations). We want the freedom to develop solutions and bid fairly to supply services to these customers without the risk that EOI would be interpreted in a way that triggers requirements to supply that same solution to any customer in any geographic area. In other words, we should retain the freedom to develop innovative solutions for customers in the same way as other active network providers. Such offers would clearly need to be 'fair' and compliant from a competition law prospective, but such an assessment would focus on the potential for any offers to have an exclusionary effect on network rivals, not on whether all other customers had access to the same terms of supply outside the bid process.

24. We note from Ofcom's assessment of the need for a non-discrimination requirement at paragraphs 11.48 to 11.51 that the focus is clearly on preventing preferential treatment in favour of downstream parts of BT, reinforcing the headline point set out at paragraph 10.3. We would also expect Ofcom to consider geographic differences and the specific nature of any bidding process in considering how to approach issues of 'equivalence': For instance, the services supplied under any specific bid may be very different to those supplied more generally – e.g. different geographic focus, different customer commitments, etc. Nevertheless, a concern remains that the EOI requirement could remove commercial flexibility.

25. Allowing Openreach the flexibility to respond to pressure from infrastructure rivals (direct and indirect) is critical to the (market-driven) dynamic Ofcom is looking to drive which ultimately delivers benefits to customers. The availability of DPA, including on unrestricted terms, is expected to have a significant impact on competition in the supply of active business connectivity services and lead to increasing levels of competitive pressure, particularly for VHB services and in areas with high business presence where there is already alternative network build (e.g. HNR/Metro areas). While Ofcom has provisionally concluded that we hold SMP across broadly defined product and geographic markets, there will be strong competitive pressure in looking to supply certain customers in certain areas with business connectivity.

26. Given this and the strong direction of travel towards effective competition across markets, Ofcom should reconsider the need for the EOI obligation: Openreach will not have the incentive to favour downstream BT Group businesses in these segments and markets as this would make it less competitive vis-à-vis rivals. The Commitments already require Openreach to treat all its downstream customers equally. If there is a specific concern that Openreach could engage in a price squeeze or otherwise act to the disadvantage of network rivals in areas and market segments where Ofcom continues to find SMP, obligations including the fair and reasonable requirement and the no undue discrimination obligation prevent Openreach from doing so, and general competition law also prohibits such behaviour.

27. We therefore request that Ofcom remove the EOI obligation in areas and market segments where competition is expected or that – where it finds this poses specific risks to its objectives – Ofcom is equally more specific in either limiting the legal instrument on EOI to the provision of services to downstream divisions or clarifying how it would assess EOI in the context of bids.

General remedy - Requirement to supply services on fair and reasonable terms

28. Ofcom is clear at paragraphs 11.10 to 11.11 in the Consultation that the fair and reasonable requirement is imposed to prevent Openreach imposing a margin squeeze via the terms of supply of BCMR services. However, we are concerned that a broader interpretation could be applied in practice and this may again serve as a barrier to commercial flexibility. We therefore ask Ofcom to confirm that the fair and reasonable obligation be limited to preventing Openreach supplying services on terms that would give rise to a squeeze on the margins of the retail providers competing against downstream parts of BT – i.e. the gap between Openreach charges and prevailing retail prices would be insufficient to support profitable supply by an efficient retail provider.

2. CI Inter-exchange connectivity and dark fibre

Summary of key points

- Regulated dark fibre is an inappropriate remedy which is particularly damaging to investment incentives and economic efficiencies.
- The market definition and SMP assessment on which the imposition of the proposed dark fibre remedy relies are unsound and out of line with accepted methodologies.
- The proposed remedy is inappropriate and disproportionate. It would not deliver the claimed benefits, and indeed these are overstated and there would be significant downsides. As currently drafted, the remedy would undermine investment in competitive core networks. The implementation timescale is not achievable, and the Legal Instrument does not reflect Ofcom's proposals.
- If Ofcom goes ahead with the proposed remedy, i) it must be properly scoped to address the competition concerns identified ii) errors in the analysis and Legal instrument would need to be corrected, iii) guidance would be needed on what would constitute a reasonable request for dark fibre and iv) the implementation timescale must be achievable. Ofcom should re-consult on revised proposals.

2.1 Regulated dark fibre is an inappropriate remedy which is particularly damaging to investment incentives and economic efficiencies.

29. As Openreach has explained in previous Ofcom consultations and in its evidence on previous appeals, we have significant concerns about requiring us to supply dark fibre as a regulated service, and not least about Ofcom's indications that it sees a wider scope for regulating the supply of dark fibre going forward. Dark fibre is commercially available as a product in the market place, but the terms on which it is supplied will be a balance between a range of complex factors relevant to the supplier and the purchaser – e.g. ensuring efficient use of existing fibre strands and deployment of new electronics equipment by the purchaser; ensuring the supplier can fully recover the costs of assets in place and is not left exposed as, for instance, the purchaser rationalises the number of fibre strands it utilises; etc.

30. It is notable that the proposed terms on which we would be required to supply dark fibre as a regulated service bear no relation to the terms that are negotiated commercially and understate or overlook the complexities that arise in unbundling existing services in this way. They therefore risk damaging cost recovery, investment incentives and economic efficiency. Rather than supporting investment in networks to extend customer choice, introducing regulated dark fibre could have the effect of deterring investment and innovation. In particular:

    a. Ofcom is proposing to regulate the price of dark fibre based on an *averaged* (single standardised) cost. This would not take account of the volume of active fibre currently used on the relevant routes or on the availability of spare fibres. This structure could therefore encourage inefficient CP investment in multiplexing equipment rather than purchasing of additional access services on a route where the marginal costs of fibres could be low. As a result, the balance of the economic decision to use fibre or to multiplex over dark fibre is distorted.[6]

[6] See Annex B, paragraphs 82-91 for more detail.

b. As a result of this, CPs may utilise fewer fibre strands on a route compared to those required to support active services. This increase in the average cost of a utilised strand on a route would not be captured in the pricing, which is based on current utilisation. This would then threaten cost recovery on that route, such that there would be little incentive for Openreach and other infrastructure providers to invest in fibre. The lack of incentive to invest is also true where we are required to supply dark fibre on routes where there is little current fibre causing the marginal cost of fibre to be very high.

c. Normal commercial contracting[7] for dark fibre avoids the above issues through bespoke contracting which allows bilateral consideration of impacts on supplier and purchaser supporting an industry-wide efficient outcome. Ofcom's proposed regulated pricing (in this and previous consultations) does not achieve this.

31. Further we do not consider a dark fibre remedy would bring the innovation benefits that Ofcom claims. We set out our position in relation to Ofcom's claimed innovation benefits in more detail at paragraphs 48-53 of Annex B below.

2.2 The market definition and SMP assessment on which the imposition of the proposed dark fibre remedy relies are unsound and out of line with accepted methodologies

32. Ofcom's market definition and SMP assessment of inter-exchange connectivity in the Consultation together take up just 19 pages in the Consultation.[8] This analysis is superficial considering that this is a newly-defined market that has not featured in previous BCMRs.

33. In addition, Ofcom's analysis is not well-aligned with the general understanding of the way core networks work or with the Commission's list of relevant markets susceptible to *ex ante* regulation. Aspects of the analysis are also circular and hard to understand. Ofcom states[9] that inter-exchange connectivity services provided by Openreach are trunk segments: we note that the European Commission determined almost twelve years ago that trunk segments of leased lines were no longer susceptible to *ex ante* regulation and therefore removed them from its list of relevant markets that regulators are obliged to review. In view of this, it would be perverse if trunk segments were to be regulated in the UK, which has one of Europe's most competitive telecommunications markets.

34. Confusingly, Ofcom does not explain the relationship between inter-exchange connectivity, trunk segments and core networks, and these terms are not defined in the Legal Instrument. The Consultation states that connectivity between BT exchanges forms part of a "wider set of trunk connections"[10] which includes trunk connections "to and from the network nodes of other telecoms providers". Other CPs' networks appear to form part of a separate trunk market. This raises a number of questions around the logic underlying these definitions which the Consultation does not address, in particular:

a. What is the scope of the "wider set of trunk connections" of which inter-exchange connectivity provided by Openreach is just a subset?

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7 E.g. higher up-front price and/or long term contract similar to indefeasible right of use arrangements.

8 Sections on market definitions and SMP in earlier BCMR consultations have been significantly longer

9 Consultation, paragraph 7.11

10 Consultation, paragraph 7.12

b. In which market do connections between BT exchanges and other CP networks fall? This is not made clear in the text of section 7 of the Consultation or in the draft Legal Instrument.

c. What is the relationship between core networks and the trunk market? Trunk markets have generally been understood as akin to long-distance conveyance defined by points of competitive egress out of BT's network, and this does not appear to be what Ofcom means by inter-exchange connectivity.

35. In any event, the market for inter-exchange connectivity as defined in the Consultation only applies to the Openreach network: obviously, this results in a bias towards Openreach being found to have SMP.[11]

36. The SMP assessment of this market is questionable in further ways, such that it results in over-regulation of Openreach, for example:

a. There is inadequate consideration of market shares. This matters in particular in the assessment of BT+1 exchanges: here, Ofcom's analysis does not take into account that Openreach may have a lower share than the other provider at an exchange and should therefore not be found to have SMP there;

b. Although each exchange is defined as its own geographic market, the SMP assessment is carried out using the averages of specific indicators (such as distance to competitor networks) across broad cohorts of exchanges ("BT Only", etc). This means the characteristics of individual exchanges within cohorts are not identified, and the result is that that a significant number of exchanges fall inappropriately under an SMP designation – for example the c.300 BT Only exchanges which our modelling show to be located within 600 metres of an alternative network;

c. The SMP assessments contain other errors: for example, there are 162 exchanges defined as BT Only at which Openreach sells external Cablelink to other CPs. Clearly, these should not be classified as BT Only exchanges;

d. The finding that Openreach has SMP in BT+1 exchanges relies on assertions about the possibility of collusion[12] in a market with two competitors. Even if Openreach had the ability and incentive to collude, the correct regulatory response would be a finding of joint SMP. However, we do not have the ability or incentive to collude in this market, nor is any evidence of collusion between Openreach and any other provider of inter-exchange connectivity presented.

37. These and other issues relating to Ofcom's market definitions and SMP assessments for inter-exchange connectivity are discussed in more detail in Annex A.

2.3 The proposed remedy is inappropriate and disproportionate. It would not deliver the claimed benefits and there would be significant downsides. As currently drafted, it would undermine investment in competitive core networks. The implementation timescale is not achievable

38. Irrespective of the shortcomings of Ofcom's market definition and SMP assessment, the proposed remedy does not meet the criteria for regulatory obligations in the telecommunications regulatory framework: these are required by section 47(2) of the Communications Act 2003 to be "objectively justifiable in relation to the networks, services, facilities, apparatus or directories" to which the obligation relates and proportionate to

11 We note that Ofcom has a duty under section 47(2) of the Communications Act 2003 to ensure that any SMP remedies imposed are not unduly discriminatory, objectively justifiable and proportionate.

12 Consultation, paragraph 7.66

what the obligation is intended to achieve. These requirements are accepted to mean that a regulatory remedy should be the least intrusive remedy to address the harm identified.[13]

i) The competition concern Ofcom seeks to address through the proposed remedy is not clear

39. In the original version of the Consultation, published on 2 November, Ofcom cited a number of problems that the proposed remedy was intended to address: cost issues, since backhaul would be available at lower prices, including in marginal access areas where Ofcom believes lower prices would incentivise infrastructure investment; innovation issues, since CPs using dark fibre would be able to use their own electronic equipment; and competition concerns relating to the costs associated with core infrastructure.

40. Ofcom has since effectively deleted the latter justification, changing the wording to refer to "competition concerns in backhaul" in the 19 December 2018 corrections and clarifications. However there is still no clear, unambiguous, public statement of a competition problem for which the proposed dark fibre obligation would be the least intrusive remedy. In particular Ofcom has not made any formal or pragmatic explanation of the distinction between backhaul and core or investigated the dynamics of those segments. See further section II of Annex B.

ii) The impact of Openreach providing DPA and Optical Filter Connect has not been taken into account

41. Under Ofcom's proposals in the separate consultation on the Physical infrastructure Market Review ("PIMR"), published alongside the Consultation on 2 November 2018, Openreach would have an obligation to provide unrestricted DPA ("uDPA") to other CPs from around one month after the PIMR Final Statement is published in spring 2019. These timescales are the same as those for Ofcom's planned publication of the BCMR Final Statement and implementation of the dark fibre remedy, so uDPA will be available very soon after the 2019 BCMR comes into force.

42. Ofcom has confirmed to Openreach[14] that the intent of the proposed remedy is "to allow providers the option to use dark fibre from BT Only exchanges to get to an exchange where they can receive competitive backhaul". Ofcom states that DPA will not be a viable means of providing this connectivity because rival networks are too far from the BT Only exchanges to make it economically viable for other CPs to reach them, even with DPA, and this is the rationale for proposing the dark fibre remedy.

43. Ofcom does not substantiate this assertion. In fact, whilst Ofcom states[15] that the average distance from a BT Only exchange to the nearest network of Principal Core Operator ("PCO") is 6.2km, there are cases where the distance is far shorter. Our analysis shows that c.300 BT Only exchanges are within 600m of an alternative network, and this may well be an economic dig distance,[16] particularly where the exchange is in a designated High Network Reach ("HNR") area.

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13 We note also that Ofcom has a duty under section 6(1) of the Communications Act 2003 Ofcom has a duty not to impose burdens which are unnecessary. Further, under section 7 of the Communications Act 2003 Ofcom needs to carry out an impact assessment where its proposals are likely to have a significant impact on persons carrying on businesses in the markets for any of the services, facilities, apparatus or directories in relation to which OFCOM have functions. Ofcom notes at paragraph 2.34 of the Consultation that the Consultation and its annexes constitutes an impact assessment for the purposes of section 7. That Impact Assessment would also need to take into account the factors set out in this response.

14 Email from Adam Lacey of Ofcom to Mike Fox of Openreach Regulatory Affairs, received at 16:44 on 19 December 2018

15 Consultation, paragraph 7.64

16 Even by Ofcom's own analysis in Table A10.5.

44. Openreach has had the benefit of reading the report prepared by Alix Partners for BT Group on this issue and agrees with the comments made.

45. We also note that Ofcom does not recognise the impact of Openreach's Optical Filter Connect product, which we launched in 2018. Using this product, a CP could wholesale services between exchanges to other CPs at very low marginal cost and would therefore be able to deliver Ofcom's objective of lower backhaul prices, which underlies Ofcom's proposal for the new remedy. The potential of other CPs wholesaling services based on Optical Filter Connect would also act as an effective competitive constraint on Openreach's ability to exercise market power in the provision of connectivity between exchanges.

46. Ofcom implies it would like to achieve wholesale aggregation investments, given it indicates that dark fibre may provide an incentive for Openreach to adjust the pricing of EBD to reflect the efficiencies of the sharing of infrastructure.[17] Openreach envisioned Optical Filter Connect being used by CPs to wholesale backhaul and replacing the legacy Ethernet Backhaul Direct ("EBD") platform, given there is little scope to reduce EBD pricing as it is already priced at LRIC. A CP who purchases Optical Filter Connect can wholesale wavelengths to other CPs if this is in the interests of the parties. Dark fibre is not necessary to wholesale. Conversely, dark fibre as discussed in Annex B, paragraphs 82-91 is likely to drive inefficient solutions.

47. We elaborate on these points further in Annex B, Section III, in the section on the role of EBD and Optical Filter Connect being underplayed by Ofcom.

iii) Scope of the remedy and impact on competitive routes and investment

48. Openreach is particularly concerned that no limits are set in the Consultation on the dark fibre remedy, such that a CP could use dark fibre to obtain connectivity all the way from a BT Only exchange to another exchange which was close to a particular destination node in a CP's network, no matter where in the UK that node was located.

49. This means the remedy as drafted would be open to misuse as it would oblige Openreach to provide dark fibre on over 12 million possible routes spanning the UK. Even if a distance limit was imposed, the number of routes on which Openreach would be obliged to provide dark fibre would still be very high: for example with a limit of 45 kilometres, the number would be over half a million. This, combined with the very low prices proposed by Ofcom (which are significantly below the prices for commercial dark fibre in competitive markets), would have a serious and destabilising impact on the industry and investment in new networks and would undermine investment in competitive core networks.

50. Further, it would have other unintended and perverse results. For example, [redacted]

51. We expand on these points in Annex B, Section IV, Scenario 1.

[17] Consultation, paragraph 12.24

iv) Limited demand, effects of industry change and potential impact on legacy network structures

52. Ofcom wants CPs to be able to use the proposed remedy on inter-exchange connectivity routes from the 4,327 exchanges that it designates as 'BT Only'. In fact, there are a number of factors which mean that dark fibre will only be taken up on routes from a subset of the BT Only exchanges and that much of this demand will be short-lived as a result of industry changes that are already underway.

53. Take-up would only be likely on a subset of routes from BT Only exchanges: the large non-BT CPs – those that Ofcom designated as Principal Operators ("POs") for the purposes of the 2018 Wholesale Broadband Access ("WBA") market and which include Sky, TalkTalk and Vodafone – only have a presence at [redacted] of the BT Only exchanges. The remaining [redacted] exchanges are mainly small rural exchanges where few non-BT CPs have found it economic to establish a presence. Of the [redacted] exchanges where WBA POs are present, there are [redacted] at which both of the two CPs which use the most backhaul connectivity, Sky and TalkTalk, are present. These facts indicate that demand for the proposed remedy would be low, such that the remedy itself would be a disproportionate intervention.

54. This will be even more the case in the future, since in response to the planned closure of WLR in 2025 in preparation for a full-fibre future, CPs transitioning to fibre products will need to migrate over the coming years to two new Openreach services:

    a. Single Order GEA ("SOGEA"), which will offer standalone or "naked" fibre broadband, i.e. without a voice service; and

    b. Single Order Transitional Access Product ("SOTAP"), which will enable customers that are currently connected via traditional copper lines to order a broadband service which is not reliant on the analogue PSTN service, which is planned to be switched off by 2025.

55. SOGEA and SOTAP will bypass smaller exchanges which have generally been designated by Ofcom as BT Only, with traffic being conveyed direct from street cabinets to 1100 Openreach NGA handover points. These are exchanges on Openreach's main fibre routes that have been selected as NGA handover points based on factors such as availability of colocation and power for CPs. Of these exchanges, only c.300 are BT Only exchanges, i.e. the exchanges from which Ofcom proposes that dark fibre should be available.

56. Further, most of the exchanges classified as BT Only will become obsolete and need to be closed as BT withdraws from copper services over the coming years: BT has announced an ambition[18] to move from 5600 exchanges to 1100 handover points with a substantial exchange closure plan.

57. If CPs are incentivised to take up dark fibre services from such exchanges, this will store up problems for the future: either CPs will have to move to other exchanges that will remain open, which could result in service disruption and transition costs, or BT will be obliged to keep redundant exchanges open, with costs of this inefficiency being inevitably passed on to customers. This would be a further economically inefficient disbenefit of the proposed remedy.

[18] See Slides 34-35 in BT's 2017/18 Q4 quarterly results, on-line at https://www.btplc.com/Sharesandperformance/Financialreportingandnews/Quarterlyresults/2017-2018/Q4/Downloads/Slides/q418-slides.PDF

58. Additional points on this issue are set out in Annex B, Section IV, under the sub-heading "Fossilising reliance of CPs on BT exchanges".

v) The proposed pricing structure would have harmful effects

59. The proposed pricing structure will make a bandwidth gradient for active services impossible 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. Ofcom has not 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 to efficiently recover its costs whilst maximising output.

vi) The remedy would not deliver the claimed benefits

60. In view of the probable low and short-lived demand for the proposed remedy, its benefits would be less extensive than Ofcom claims. In particular, the total savings to be made across the industry from lower cost backhaul are likely to be small. Other benefits claimed by Ofcom are also likely to be small-scale or not likely to arise at all. For example, it is doubtful whether CPs' selection and configuration of their own electronic equipment further to the introduction of the proposed dark fibre remedy would lead to any material product innovation, since transmission equipment is standardised as part of a global market, and all CPs rely on the same set of equipment from a restricted number of international suppliers.

61. We note that many of the benefits that Ofcom claims for the proposed dark fibre can be achieved through Openreach's existing portfolio, in particular its Optical Filter Connect product, contrary to Ofcom's assertions in paragraphs 12.32 and 12.33 of the Consultation.

62. We expand on these points in Annex B, Section III.

vi) Ofcom's implementation timescales are not realistic

63. Ofcom proposes that Openreach should make the proposed remedy available within one month of the date of publication of the BCMR Final Statement.[19] This very short timescale relies on the assumptions that:

    a. Openreach completed most of the work needed to deliver the proposed remedy in the course of its preparations to launch the Dark Fibre Access product mandated in the 2016 BCMR; and

    b. It would not be necessary for BT to make significant amendments to the earlier product in order to deliver the new product.

64. Ofcom is required under section 87(4) of the Communications Act 2003 to consider the feasibility of the proposed network access before imposing a network access obligation. In fact the assumptions that Ofcom relies on to justify its implementation timescales as technically feasible are wrong. In particular, the new dark fibre remedy is materially different to the dark fibre remedy mandated in 2016. Whilst it would be possible to re-use the design logic employed for the previous product, additional design and development would be required to meet the specification of the new dark fibre remedy. The software developed for the earlier product would need to be updated to make it compatible with the current version of Openreach's Equivalence

[19] If Ofcom's target timescales were achieved, this would mean an implementation date in the spring or at the latest in early summer.

Management Platform ("EMP") system. Operational testing would need to be successfully completed, and the Openreach people responsible for delivering the product would need to be trained.

65. Ofcom's proposed timescale would only allow Openreach one month to negotiate the Reference Offer for the proposed remedy with industry. Past experience with the dark fibre access product mandated in the 2016 BCMR indicates a strong possibility that this negotiation would be contentious and protracted. CPs would themselves need time to consider and understand the Reference Offer proposals put forward by Openreach, and Openreach would need to consider and respond to any comments or concerns that they raised. The one-month timeframe proposed by Ofcom could lead to unnecessary disputes which could have been avoided if a longer period had been allowed. A more reasonable timeframe to complete industry negotiations for the new Reference Offer would be four months from the date of publication of the final BCMR Statement.

66. In relation to Ofcom's SLA/SLG proposals for Dark Fibre, whilst we agree with Ofcom's proposals for Openreach to include SLAs and SLGs within its Reference Offer for provision and repair, these should only come into force after a suitable 'bedding-in' period. Openreach consider that a period of six months after launch of the proposed dark fibre remedy will provide both a sufficient time period and the necessary volume of orders to enable Openreach and industry to monitor performance and agree suitable metrics.

67. Implementation of the proposed remedy would require Openreach to deliver a significant programme of training for desk- and field-based teams across the country. In particular, planning teams would need to be trained to process orders and field teams would have to be trained to install, test and repair dark fibre circuits. The latter would be a significant exercise, as working with passive fibre is fundamentally different to the working on active products that our teams carry out today. We do not consider these training programmes could be delivered in one month. We would also note that the dark fibre training programme would need to be delivered in parallel with the roll-out of the uDPA product proposed in the PIMR, which is already a challenging exercise in itself.

68. Further, new products and product upgrades are implemented in system releases (generally at most two per quarter) which are scheduled months in advance and which have finite capacity in terms of the changes they include. There is no spare capacity in any releases that would allow the proposed remedy to be implemented in the timescales envisaged by Ofcom.

69. We have set out own view of the earliest possible implementation milestones in paragraph 98 below and Annex C.

vii) The Legal Instrument does not reflect Ofcom's proposals

70. Openreach is concerned that the text of the draft Legal Instrument does not reflect Ofcom's intended scope of the dark fibre remedy as set out in the Consultation and in the clarifications it provided on 19 December 2018.

71. As we have noted above, Ofcom stated in its 19 December clarifications that its intention is that the proposed remedy should apply along routes from a BT Only exchange to another BT exchange, rather than to another network node. However this is not reflected, or at the very least is unclear, in the draft Legal Instrument.

72. Under Condition 2.1(c) of the draft Legal Instrument, BT would be required to provide Dark Fibre Access in Backhaul Segments where one or more circuit end(s) terminate(s) at a BT exchange which is identified as a "BT Only" exchange in Schedule 6 [of the Notification].

73. Per Table 1 in Part 1 (Application) of the Schedule 1 of the draft Legal Instrument (pages 8 and 9), Condition 2 in its entirety applies to all of the markets in which BT has been identified as having SMP. Condition 2.1(c) therefore applies at least in principle to (i) all wholesale markets for CI Access services in which BT is identified as having SMP and (ii) the wholesale market for CI Inter-exchange Connectivity services along Non-competitive IEC Routes.

74. Whilst Condition 2.1(c) does supposedly limit the requirement to provide Dark Fibre Access to "Backhaul Segments", the definition of Backhaul Segments is as follows:

> "Backhaul Segment" is defined as:
>
> "network access providing uncontended bandwidth connecting either—
>
> (a) an operational building of the Dominant Provider to—
>
> (i) another operational building of the Dominant Provider; or
>
> (ii) an operational building of a Third Party;
>
> or
>
> (a) an operational building of a Third Party to—
>
> (i) another operational building of a Third Party; or
>
> (ii) an operational building of the Dominant Provider"

75. The definition of Backhaul Segments therefore encompasses not only routes between BT exchanges but routes between other network nodes, contrary to Ofcom's expressed intention.

76. The geographic scope of the wholesale market for CI Inter-exchange connectivity services is limited to "Non-competitive IEC Routes". These are the routes between the BT exchanges set out in Schedule 6 of the Notification (i.e. the scope does not include routes between BT exchanges and other network nodes).

77. However, the application of a remedy can extend beyond the boundaries of the defined SMP market (to the extent it is intended to remedy competition concerns identified in the market in which an operator has SMP and is proportionate to addressing those concerns).

78. The drafting in the draft Legal Instrument does not reflect Ofcom's stated intention for the application of the remedy as it is explained in the Consultation document, given that Dark Fibre Access is required to be provided on Backhaul Segments, and this encompasses not only routes between BT exchanges but also routes between other network nodes.

79. Further lack of clarity arises because, as identified above, the application of Condition 2.1(c) is not stipulated solely to apply to the wholesale market for CI Inter-exchange Connectivity services along Non-competitive IEC Routes. Rather it also applies in all of the "CI Access services" markets in which BT has been identified as having SMP.

80. It appears to be Ofcom's intention that "CI Access services" (together with the term "CI Inter-exchange Connectivity services") should be defined, since the term appears in bold in Table A of Annex 23. However, it is not. It may be that Ofcom intends CI Access services to be limited in the same way as the definition of "Access Segments", i.e. one end of a circuit must terminate at an "end-user premise" (again not defined). However, this is not clear. Paragraph 7.11 of the Consultation suggests that CI Access services encompass "terminating segments". However, such a phrase is not included in the definitions in the Legal Instrument.

81. Openreach presumes that the CI Access services market is not intended to include "Backhaul Segments". In this regard Openreach notes that at paragraph 7.12 of the Consultation, Ofcom considers that trunk connections include connections to and from the network nodes of other telecoms providers (which are presumed competitive because they are part of other telecoms providers' core networks, networks that can rival BT's).

82. Given the lack of clarity above, it is unclear from the Legal Instrument whether the Dark Fibre Access obligation could extend to the various CI Access services markets. Openreach considers Ofcom should include a separate definition for "CI Access services" (and "CI Inter-exchange Connectivity services") to make clear what network segments are included in what market and amend the legal instrument to make clear that the dark fibre remedy is only intended to apply along Non-competitive IEC Routes.

83. Whilst Ofcom published an amended version of the consultation and the draft Legal Instrument on 19 December 2018, no updates were made to address the lack of clarity identified above.

84. As the Legal Instrument is the actual measure which imposes legally binding SMP obligations on BT and it is those measures on which Ofcom is consulting, it is vital that stakeholders, including Openreach, are given an opportunity to comment on the drafting of the text of a revised legal instrument that actually reflects what Ofcom is intending with its remedy. Openreach therefore considers it is imperative that Ofcom revise the text of the draft Legal Instrument taking account of the issues identified above so that it accurately reflects Ofcom's stated intention and issue a new consultation to stakeholders on these revised measures.

2.4 If Ofcom goes ahead with the proposed remedy, i) it must be properly scoped, ii) errors in analysis need to be corrected, (iii) errors in the Legal Instrument need to be corrected, iv) guidance would be needed on what would constitute a reasonable request for dark fibre and v) the implementation timescale must be achievable. Ofcom should re-consult on revised proposals

i) Scope of the remedy and Openreach proposal

85. For the reasons outlined above, Openreach considers it would be wrong for Ofcom to proceed with the introduction of the proposed dark fibre remedy. Notwithstanding those concerns, to the extent Ofcom were to proceed with the proposed remedy, the actual remedy as designed would be disproportionate in its scope. We understand Ofcom's intended purpose for the proposed remedy, even though this is not explicit in the Consultation, is to enable the provision of backhaul from a non-competitive exchange to the nearest exchanges at which competitive backhaul was available.

86. It might be possible to define a set of rules to define the scope of the dark fibre remedy in a manner which avoids some of the most damaging consequences of the current design. Any such rules would have to reflect proper consideration of the range of constraints including: the desire to prevent inefficient aggregation across single fibres from the price distortions associated with the disparity between the marginal and average costs of fibre; the need to protect core network competition and the infrastructure already sunk by many players; the need to fit with the long-term strategic direction of investment incentives and to permit a degree of flexibility according to the local circumstances and requirements of each CP. The remedy would also need to reflect Openreach's future rather than legacy network topology and be designed to minimise the inefficient use of fibre.

87. For example, the proposed remedy could be limited so it was available from each BT Only exchange back to a specific NGA parent handover exchange. This would align with Openreach's future network design. Not all

of these NGA handover points are currently considered competitive by Ofcom. However, given their long-term strategic nature, the correct incentive should be for CPs to have their own independent build to these locations. Therefore, even where there is no competitive presence at these locations currently, this should be encouraged. This would also be fully consistent with preferring a DPA remedy where full independent build is not viable.

88. Because Openreach's specific child-parent exchange mappings are based on the presence of enduring major fibre routes, this approach would ensure more efficient fibre routing and provide greater certainty of fibre availability. As with Openreach's active Ethernet products, a separate "Resilience Option 2" would also be an option for dark fibre on these routes. The availability of Openreach separate duct for resilience would also be greater, though not guaranteed, following the NGA child exchange to parent handover exchange fibre route.

89. This option for the introduction of a dark fibre remedy would be as consistent as is possible with the long-term strategic objectives of competition as outlined by both DCMS and Ofcom. The scope is simple and clear and the location of the handover for any one BT local exchange is well defined. Note this broadly corresponds to Scenario 3 in Annex B, Section IV below, which is focused on NGA handover points.

90. Following the long-term strategic NGA handover exchange structure based on enduring fibre routes would also provide a simpler and clearer solution which would minimise the risk of inefficient fibre utilisation and the "fossilisation" of intermediate BT local exchanges.

91. Any such rules would have to conform to legal contractual freedoms available to Openreach or permissible under sector regulation and competition law more generally.[20]

92. Openreach would welcome further discussions with Ofcom on designing a practicable option along the lines discussed above, in the event that Ofcom remains committed to the introduction of a dark fibre remedy contrary to our objections to it.

93. Separately, Openreach considers that the requirements of the remedy would also need to reflect the current industry technical and safety practices in operation regarding the use of lasers. Because of this it is our view that any dark fibre remedy should include the distance limitation previously proposed by Ofcom for the dark fibre remedy in the 2016 BCMR. Ofcom's proposal to remove the distance limitation overlooks the existing 45 km 'main link' (exchange to exchange) radial distance limitation in use today for the Openreach active portfolio and upon which all current operational planning processes are based. The current distance limitation is based on proven engineering principles concerning the optimum reach of a circuit before amplification is required and the technical (and safety) limit in how far Openreach could reliably test a fibre.

ii) Correction of errors in Ofcom's analysis

94. There are also a number of errors and anomalies in the classification of exchanges to the BT Only, BT+1 and BT+2 categories and the SMP designations that need to be corrected and resolved, as they lead to over-regulation of Openreach. In particular:

    a. There are 162 exchanges defined as BT Only at which Openreach sells external Cablelink to other CPs;

[20] See the Openreach response of 29 December 2017, paragraphs 289-294 on this matter.

b. We estimate there are c.300 BT Only exchanges that are classified as BT Only but which, based on our modelling,[21] are within 600 metres of an alternative network;

c. The implication[22] of paragraph 7.68 in the Consultation is that there are BT+1 exchanges where Openreach has a lower service share than the other operator. We should not be found to have SMP at these exchanges.

95. Further, Openreach has set out comments relating to Ofcom's approach to the pricing of the proposed dark fibre remedy in our response to Volume 2 of the Consultation. To the extent that Ofcom proceeds with the proposed remedy, these points would need to be addressed.

iii) Correction of errors in the Legal Instrument

96. We have made a number of comments on the draft Legal Instrument at paragraphs 70-84 above. In addition to those we note that Ofcom also proposes that the dark fibre remedy be provided in accordance with the same systems and processes as Ethernet services (Condition 2.1(a) of Annex 23) or WDM Services (Condition 2.1 (b) Annex 23). Ethernet and WDM services are not necessarily provided using the same processes or in the same manner, and the previous dark fibre remedy mandated in 2016 was designed to replicate the processes in use for the Ethernet Access Direct (EAD) product. We understand that Ofcom considers it would make practical sense for the dark fibre remedy to be "linked to EAD".[23] If Ofcom proceeds with the proposed dark fibre remedy, it should provide clarity on this point in the BCMR Final Statement

iv) Guidance on what would constitute a reasonable request for dark fibre

97. Ofcom has indicated that it considers arrangements concerning the provision of new infrastructure should be the same as those relating to active services.[24] Openreach considers the limits of a regulatory network access obligation, in particular what constitutes a "reasonable request", should align to the principles Ofcom set out in its 2018 Wholesale Local Access Market Review ("WLA") Final Statement in relation to the PIA remedy. We make a number of points below.

a. A dark fibre access remedy should be not broadly interpreted, but should be limited to access to already existing duct and fibre. This would be:

i. consistent with the approach undertaken by Ofcom in the WLA 2018 Final Statement with reference to the PIA remedy, where network extension has been explicitly excluded by Ofcom from the scope of any access obligation, as well as with Ofcom's 2018 Strategy Paper on supporting investment in full-fibre broadband, which advocates an holistic approach between the WLA and BCMR markets;

ii. in line with general competition law provisions, which do not compel dominant undertakings to build new infrastructures or expand the capacity of existing ones to allow market entry or growth of new players; and

iii. proportionate considering the benefits and risks attached to dark fibre as outlined by Ofcom in the Consultation, in particular because a broad interpretation of the access remedy would likely

21 This modelling is based on our understanding of the location of Virgin Media's network

22 The relevant information is redacted

23 Email from Matthew Thomas of Ofcom to Katherine Roche of Openreach, received at 11:21 on 18 December 2018

24 Consultation paragraph 12.107

have a significant impact on other operators' incentives to invest (contrary to Ofcom's assumptions) and might also likely result in investment not being feasible or commercially viable for Openreach, possibly leading to under-recovery of costs in some circumstances.

b. "Reasonable request" should be interpreted along the lines of the criteria which have been used by Ofcom in establishing whether a network adjustment falls within the scope of the PIA obligation, namely if it is necessary, feasible and if it improves efficiency. Openreach outlines a number of key scenarios in this regard in Annex B.

v) Implementation timescale

98. The timescale for implementation should be changed to make it realistic, reflecting the issues of capacity and timing in our systems release schedule. In our view, Openreach would need five months to launch the dark fibre remedy utilising two development cycles as set out below, assuming publication of the BCMR Final Statement in April 2019. These are the earliest possible releases that could be used, since all releases before July 2019 are taken up with changes agreed with our customers, including developments on our critical DPA and FTTP products. For the avoidance of doubt, if there is any delay in the publication of Ofcom's Final Statement, the timescales would be correspondingly delayed. More detail is given in Annex C.

Release	Deliverable
July 2019	'Soft launch' in August, enabling customers to place a limited numbers of orders and allowing Openreach to test the software and processes internally and in the live environment with CPs.
September 2019	Full product launch in October, delivering remaining capabilities including, for example, migrations and ceases.

vi) The need for re-consultation

99. In this section, we have argued that – notwithstanding our arguments about the appropriateness of introducing a dark fibre remedy at all – if Ofcom decides to go ahead with the dark fibre for inter-exchange connectivity, it needs to clearly set out the scope of the remedy; correct the errors in its analysis and the Legal Instrument; provide clear guidance for industry on what would constitute a reasonable request for the remedy; and change its implementation timescale to allow enough time for the required industry negotiations and development and implementation of new systems and processes.

100. This would mean substantial changes to the proposals for dark fibre that Ofcom has already put forward. In view of this, Ofcom would need to publish a new, separate consultation on this aspect of the BCMR to allow stakeholders the opportunity to comment on the revised proposals.

101. This would mean decoupling the consultation process, including the 'Article 7' notification to the European Commission, for the proposed remedy from the wider BCMR consultation process. However given that Ofcom does not make a compelling case that there is a material competition problem that dark fibre is needed to resolve, we do not consider this would lead to significant dis-benefits to consumers or other stakeholders.

3. CI Access market definition and SMP assessment

Summary of key points

- Ofcom's approach contains a number of methodological errors which are biased against Openreach and lead to over-regulation, in particular: reliance on 2017 new connections as a basis for market shares; Ofcom's interpretation of supply-side substitution as the primary source of competitive constraint; and the geographic methodology used, which does not properly recognise network competition.
- We are surprised Ofcom considers the evidence leads to the conclusion that there is a single product market at all bandwidths: we consider the evidence points to a break between 1G and VHB.
- We disagree with Ofcom's assessment that Openreach would still have SMP in the VHB segment even if it was a separate market.

3.1 Summary

102. Openreach considers Ofcom needs to reassess a number of aspects of its approach to market definition and SMP assessment in CI Access services. We consider its current approach contains a number of fundamental methodological errors, which are biased against Openreach and fail to take account of the guidance in the Competition Appeal Tribunal's ("CAT") judgment following BT's appeal ("the Appeal") of Ofcom's Final Statement in its 2016 Business Connectivity Market review. These errors lead Ofcom systematically to over-regulate Openreach.

103. We highlight in particular the use of CPs' shares of connections in calendar year 2017 as the basis for Ofcom's market power assessment rather than shares of the total installed base. As a result of this methodology, Ofcom's conclusions are unsound, including its definition of a single product market covering services at all bandwidths, in which BT has SMP in all geographic markets except the CLA and the Hull Area.

104. The relevant provisions governing Ofcom's powers to impose SMP conditions are contained in the Common Regulatory Framework under EU law and specifically Directives 2002/21/EC ("Framework Directive") and 2002/19/EC ("Access Directive"). In summary, SMP remedies can only be imposed following a market analysis carried out in accordance with Article 16 of the Framework Directive: see Article 8(2) Access Directive. Article 16 of the Framework Directive requires the NRA's first step to be the undertaking of a market definition exercise in accordance with Article 15(3) of the Access Directive and taking utmost account of the Commission Recommendation and Guidelines referred to therein.

105. The domestic legal framework reflects the Common Regulatory Framework and is contained for the most part in the Communications Act 2003. In particular it stipulates, under s 6(1) of the Communications Act that "*Ofcom must keep the carrying out of their functions under review with a view to securing that regulation by Ofcom does not involve (a) the imposition of burdens which are unnecessary; or (b) the maintenance of burdens which have become unnecessary.*" In summary, the regulatory framework is essentially permissive, requiring Ofcom to target regulation only in circumstances where such regulation is necessary.

106. In spite of the essentially permissive regime, Ofcom takes an unduly burdensome approach to regulation, with HNR areas outside the CLA remaining regulated despite the extent of competition in these areas resulting from the presence of two or more network competitors to Openreach. Ofcom does not take into account the different competitive conditions in very high bandwidth services, and this leads to these services being re-

regulated everywhere outside the CLA. Openreach considers this is surprising given that during the period in which such services have not been regulated under the 2017 Temporary Conditions Statement, prices have only reduced, suggesting there are significant competitive constraints to Openreach exercising any supposed market power.

3.2 Product Market Definition

107. Openreach is surprised that Ofcom considers it has sufficient evidence to conclude that there is a single product market at all bandwidths. In fact, on Ofcom's own evidence, it is clear that there is a bandwidth break between 1G and VHB services.

108. Ofcom's conclusions on the 2016 BCMR were substantively overturned by the CAT in its Judgment. Openreach is concerned that Ofcom's analysis is once again unsound.

109. Ofcom considers that the demand side analyses using Critical Sales Loss calculations are ambiguous. This is because Ofcom considers that Openreach's VHB prices are 'high' and that as such it cannot rely on them being a suitable competitive benchmark. However this is not well founded, as discussed further in Annex D, paragraph 28. However, on their own terms they are clear-cut, showing that there is a break most likely between 100M and 1G and certainly one from 1G to 10G/VHB services.[25] We present more detailed comments and evidence on this at Annex D, section III.

110. Further, Ofcom does not examine whether there are groups of products within the supposed chain which are worth monopolising. As is made clear in the CAT's Judgment, it is a necessary condition that none exist for a chain of products to be in the same product market (see in particular paragraphs 326-329 of the CAT's judgment). It is not sufficient merely to test that each link in the chain is constraining in both directions. This is a necessary, but not a sufficient, condition.

111. The possibility of combining a series of 'sub-markets' such as 100M and 1G into one overall chain of substitution requires considerable assumptions to be made. Ofcom's own assessments indicate these are implausible especially under a true Modified Greenfield Approach ("MGA").

112. On Ofcom's new analysis, the primary source of competitive constraint relied upon to define a single product market is now supply-side substitution. However, this represents a misunderstanding of the role of supply-side potential entry in the delineation of market boundary analyses.

    a. Customers who have multiple suppliers at any one site cannot benefit from additional entry from a SSNIP as there is no additional supply-side entry which can be envisaged.[26]

    b. Where customers are not served by multiple operators – as will be the position in the vast majority of cases - Ofcom provides no evidence that a SSNIP will induce infrastructure expansion. Indeed, such analysis that has been provided suggests that willingness to dig will be strongly influenced by the value of the site itself. This ought to lead Ofcom to conclude there is in fact a bandwidth break in the product market between 1G and VHB services.

[25] Ofcom's considers that the results of the critical sales loss calculations are ambiguous.

[26] The 2018 Commission Guidelines paragraph 41 explicitly states that 'NRAs may also take into account the likelihood that undertakings not currently active on the relevant product market may decide to enter the market'. By definition in this instance the undertakings are already active on the relevant product market.

113. Conversely, Ofcom relies on the risks of sunk costs to attribute Openreach with market power from its ubiquitous network, but this is the same manifestation of supply-side limitations.

114. The other factors cited for a chain, such as competitive conditions, either do not support Ofcom's hypothesis of a single product market or are tangential and not actually evidenced, such as customer inconvenience of acquiring new supply limiting dig distance variations by bandwidth.

115. If supply-side conditions dominated the assessment of a single product market in such a simple and straightforward way, it would very likely have been at the forefront of Ofcom's Defence to the Appeal. In fact, in the report by Ofcom Director of Economics Katie Curry ("the DoE Report") of some 250 pages, the role of supply-side substitution is dealt with in a mere two pages [46-47] and given no prominence whatsoever. The entirety of Section F ('Product Market Definition') of the Judgment is demand-side focused. It is remarkable that Ofcom now feels able to identify supply-side substitution as providing almost a complete answer to the issue.

116. Still further, Openreach considers that contrary to what Ofcom states, it does not have SMP in VHB were it to be considered as a separate product market. In fact, Ofcom has only actually analysed Access and of its own admission has not looked at service share for the Inter-Exchange (IEX) market. Ofcom explicitly deregulates Openreach where there is PCO presence at BT+2 exchanges as not having SMP. Openreach considers that for large parts of the UK it does not have SMP in Access for VHB and also disputes its SMP designation at BT+1 exchanges.

117. Openreach further considers that there are additional errors of principle and application in Ofcom's economic CI Access product market analysis:

    a. Ofcom fails to apply MGA correctly both in the wider context of DPA which will affect the market within the review period.

    b. Ofcom does not appear to appreciate that basing the definition of leased lines around a very specific regulatory remedy (EAD) is not in conformity with what the industry understands as a leased line. This is biasing the analysis on bandwidth breaks.

    c. Ofcom's analysis does not properly account for downstream-upstream linkages which would show that the value of a site and the bandwidth gradient are intrinsic elements of both wholesale and retail markets. In fact, Ofcom explicitly accepts the bandwidth gradient is intrinsic in this market.[27]

    d. Openreach considers that EFM services have wrongly been excluded from the CI Access product market that Ofcom has defined. Although the total system size of EFM is likely falling, there is still new provision by downstream BT suggesting that this service continues to provide a constraint for 10M EAD services

3.3 Geographic Market Definition

118. Openreach considers Ofcom has made a number of significant errors in the methodology used to define geographic markets for CI Access. This leads Ofcom to incorrectly restrict the number of High Network Reach ("HNR") areas. Openreach sets out its comments on Ofcom's geographic market analysis in full at Annex E. However, we note in particular that:

[27] Consultation, Annex A7.10, Footnote 28

a. Ofcom continues to use a notional database for potential demand. This is biased and significantly understates the likely presence of rival infrastructures to provide CI services.

b. Openreach is concerned at the lack of key competitor information on circuit locations. This is critical to perform a sense check on the conclusions Ofcom draws by using actual circuit connections.

c. There are reasons to believe that the use of fibre flexibility points for some CPs rather than the duct network itself will lower the estimated coverage of rival networks. However, Openreach supports in principle the move to use actual duct networks rather than fibre flexibility points.

d. Openreach does not consider the 50m rule is appropriate under an MGA, particularly in the context of Ofcom imposing an unrestricted duct and pole access remedy. Further, there are issues of the accuracy of being able to plot rival infrastructures within this range. Examples are provided showing this.

e. The sensitivity analysis conducted by Ofcom indicates that the 65% coverage threshold is likely too high. In the light of other factors which tend to understate rival infrastructure presence, Openreach submits that a 50% threshold would be more appropriate.

119. Openreach considers that Ofcom's revised approach continues to make a number of fundamental errors in assessing geographic markets and fails adequately to take account of the CAT's Judgment. Too few postal sectors are identified as HNR arising out of a combination of methodological errors and weaknesses as summarised above.

120. Additionally, as set out above, given that on Ofcom's own evidence there is a bandwidth break, Ofcom should have ensured that the geographic markets are defined for each separate product market separately as set out in the Judgement (see paragraph 392 of the Judgment).

3.4 SMP Assessment

121. Openreach does not agree with the methodology Ofcom uses to assess market power and the resultant findings. Openreach's concerns on Ofcom's SMP assessment stand even if Ofcom had correctly defined the product and geographic markets, which, as set out above, is not the case. We set out below a summary of our concerns which are expanded on in Annex F.

122. Ofcom's reliance on a single year of connections for 2017 as indicative of service share is inappropriate and biased against Openreach. It is fraught with data problems and unsustainable in the context of the European Commission Guidelines and the requirements to establish SMP. It is not reasonable for a market review not to include accurate information from all infrastructure networks, particularly on the inventory of current circuits.

123. The geographic elements which are critical in particular in the assessment of competition in HNR areas outside CLA have serious problems. First, 2017 connections data are partial and not necessarily representative of the installed base. Second, there are clear biases in the database of notional sites of demand for CI services, a high proportion of which do not and will never have CI services but which are counted as if they were, lowering CP presence to the sites that really do want these services.

124. Ofcom's conclusions on service shares of particular geographies are stated to be insensitive to the assumptions made on coverage and buffer distance. However, Annex 13, Tables A13.11 and A13.12 all have the service

shares redacted,[28] and it is not possible for Openreach to comment on the unclear text associated with these key tables. This is in spite of previous market reviews publishing even more granular information of this type.

125. For both of these factors Ofcom has not selected areas where competitive conditions are both homogeneous within the market and different to the surrounding areas. Further, postcode sectors are too large to be used in these areas. This is likely an even more acute issue for VHB services.

126. Additionally, Openreach is particularly concerned by Ofcom's hypothetical SMP assessment for VHB services which it uses as a sensitivity analysis. In this analysis, the data issues and problems referred to above are even more acute. Openreach considers that the analysis in Annex 14 is inadequate and Openreach does not agree with the conclusions drawn:

a. The statistics underpinning the service shares in the various geographic markets and the willingness to supply a VHB service which feature in the SMP analysis - all have serious shortcomings for all CI services and which will all be greatly magnified for VHB services in access.

b. We disagree that 10G or multiples of 10G will be the norm for MNOs within the next 3-5 years. We agree this market is going through a lot of change, but the exact demands are unclear, as they change regularly, and differ from MNO to MNO. [29] [redacted]

c. The fact that BT has national coverage does not detract from the fact that as infrastructure providers will target their networks for sites which have higher revenue and therefore justify extending further their own networks there are very large areas where there will likely be effective competition.

d. The pricing and margins on VHB for Openreach provides no evidence for SMP for the reasons set out in the section above on Ofcom's CI Access product market definition analysis.

127. The general shortcomings of the SMP assessment in CI Access Section 6 are even more acute in VHB as explained below. Openreach does not consider that it does have SMP in VHB provision in access save perhaps in very few geographic areas and where there is no realistic likelihood of exercise of any market power which would justify ex ante regulation.

128. Ofcom has failed to take the opportunity to consider the competitive outcomes during the period in which it did not regulate VHB services in 2017. No competition problems arose in consequence, and there remains no obvious basis now for ex ante regulation.

129. Unless Ofcom addresses the numerous concerns raised above, including collecting full and accurate information from Virgin Media, Openreach is clear that the SMP assessment for CI Access cannot be sustained.

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28 Ofcom did finally provide unredacted versions of these tables on 11 January 2018, but this was too late for us to be able to take them fully into account in this response: our preliminary thoughts are included in Annex F.

29 Information on MNO requirements has changed since Ofcom issued its original s135 requests and the general requirement is for 10G or even 1G.

4. General and specific remedies applying to both CI Inter-exchange connectivity and CI Access

Summary of key points

- Some aspects of the general remedies that Ofcom proposes could have the effect of constraining pro-competitive behaviour. This applies in particular to the obligations for EOI and the requirement to supply services on fair and reasonable terms.
- EOI should not be interpreted in a way that prevents us from responding to our customers' needs where competition between BT Group downstream businesses and other retail providers would not be affected. This applies in particular to market segments characterised by competitive tenders and the presence of large scale players.
- Ofcom should confirm that the fair and reasonable obligation is limited to preventing Openreach from supplying on terms that would give rise to a margin squeeze on retail providers competing against BT Group downstream businesses.
- We support the changes that Ofcom is proposing that would align specific BCMR remedies with the corresponding remedies imposed in the 2018 WLA Market Review.

130. Ofcom notes that:

"Over time, we expect competing full-fibre networks, capable of supporting both business and residential services, will provide an effective alternative to BT's dominance in wholesale markets for large parts of the UK."

131. Ofcom's strategic focus in across the PIMR and BCMR is on introducing upstream passive remedies that can promote investment in these competing multi-functional full fibre networks. The intended direction of travel is therefore towards more competition in the provision of active access services across residential and business connectivity markets.

132. As we have highlighted in section 3, there is already extensive competition in active access services for a large number of business customers, particularly where those customers are demanding the highest bandwidth connectivity services and are located in close proximity to customers demanding similar services – e.g. in business districts in UK towns and cities or business parks, etc. The economics of network build (i.e. the costs of extending networks to reach the customer balanced against the value opportunity of supplying the customer) will mean that such customers will already benefit from a choice of network provider. If Openreach provides shared access to its ducts and poles network on unrestricted terms, these competitive pressures will only increase – whether from truly multi-functional full fibre network suppliers serving both residential and business customers or from networks focussed on supplying high value services to business customers.

133. In this response, we propose that Ofcom takes a truly forward-looking approach to assessing the competitiveness of wholesale business connectivity access markets that gives due weight to existing and potential future competition in determining on a geographic basis where Openreach holds SMP. We believe that the proposals within the consultation would, if implemented, represent an unnecessarily cautious approach by, for instance, introducing an SMP designation on VHB services in all areas outside the CLA.

134. However, to the extent that Ofcom maintains this position in the final statement, it is vital that the intended direction of travel for the competitiveness of BCMR markets is reflected in the approach taken to setting SMP remedies and imposing constraints on Openreach's commercial activities. In short, Openreach must be allowed to compete fairly to supply active wholesale access services in the face of increasing competitive supply from other active network suppliers. This should be uncontroversial. Indeed, Ofcom signals (paragraph 10.3) that it has taken account of the potential future impact of introducing an unrestricted DPA requirement in considering what remedies to impose in BCMR markets where Openreach holds SMP. However, we are concerned that the remedies imposed may still have the effect of constraining pro-competitive commercial behaviour.

135. In general, a finding of SMP raises concerns about our ability and incentive to either:

a. exploit customers providing services on terms that would not be sustainable in a competitive market – e.g. high price, low quality, insufficient innovation, etc; and/or

b. distort competition in downstream markets by, for instance, offering preferential terms to other businesses within the BT Group.

136. Any remedies placed on Openreach as a result of the SMP finding need to be targeted at these concerns, taking full account of the nature of the risks of specific behaviours arising in the relevant market and the broader impacts that imposing any remedies may have across the market.[30] Ofcom should look to introduce a set of remedies that strike the right balance between mitigating appropriately identified risks and supporting the development of competition and competitive outcomes. Where Ofcom acknowledges that competition will grow, remedies should not have the effect of preventing Openreach from adopting commercial strategies in response to that competition where such strategies would not have the effect of exploiting customers or distorting competition in favour of downstream parts of BT.

137. Ofcom's proposed set of remedies reflect this to some extent. In particular, Ofcom does not propose to introduce cost-based charge controls on active BCMR services given the prospect of increased market entry utilising unrestricted DPA.

138. Ofcom sets out its specific competition concerns for BCMR markets at paragraph 10.13. We have set out below the remedies Ofcom is proposing to impose to directly address these concerns as described in Section 11 and elsewhere:

[30] For instance, imposing prescriptive regulatory rules – e.g. setting out detailed product specifications and determining price levels for services across a defined portfolio – runs the risk of limiting the scope for technological and commercial innovation within markets. This can then deter entry and lead to suboptimal outcomes.

Stated Competition Concern	Proposed remedy to address concerns
Openreach would have incentive and ability to refuse to provide access to its network or not provide access on terms that would secure efficient investment and innovation, both in the relevant wholesale markets and the related downstream retail markets	Requirement to provide network access on reasonable request and on fair and reasonable terms
Openreach would have the incentive and ability to favour downstream retail businesses to the detriment of competitors in the relevant retail markets, by both price and non-price discrimination	Requirement to not discriminate unduly including EOI
Openreach would have the incentive and ability to fix and maintain some or all of its prices at an excessively high level or engage in a price squeeze	Requirement to provide services on fair and reasonable terms
Openreach would have the incentive to increase prices in areas with limited or no competition to subsidise price reductions in more competitive areas (or where it considers rivals may build)	Safeguard (CPI-CPI) caps in areas outside Metro/HNR areas
Openreach may not have sufficient incentives to continuously deliver an adequate level of service quality in the provision and repair of wholesale services and this will impact detrimentally on all downstream providers of leased lines, including BT's retail businesses, which would be to the detriment of consumers	QoS remedies

139. Notwithstanding our challenges to Ofcom's proposals to determine that we hold SMP across all bandwidths in all areas outside the CLA (which would obviously limit the scope of any remedies faced), the remedies proposed could represent a reasonable balance to the extent that they only restricted the behaviours set out in the list of competition concerns. However, we are concerned that the remedies could impose broader restrictions on our behaviour. We therefore ask Ofcom to take action to limit the scope of the proposed remedies or provide assurances about the way in which these remedies would be interpreted within BCMR markets. We have two key concerns:

Equivalence of Inputs ("EOI")

140. Openreach must be allowed to compete fairly in business connectivity markets. However, some aspects of the general remedies that Ofcom proposes could have the effect of constraining pro-competitive behaviour. This applies in particular to the obligations for EOI and the requirement to supply services on fair and reasonable terms.

141. The EOI obligation is intended to address the competition concern that Openreach may supply BCMR services in a way that favours downstream businesses to the detriment of competitors in retail markets. EOI can directly address this concern by requiring us to ensure any services supplied to downstream businesses are provided on strictly the same terms and conditions to all other downstream providers.

142. However, this requirement should not prevent us from introducing geographically differentiated pricing or competing against new active network providers when competing for wholesale access business, where competition between downstream BT Group businesses and other retail providers would not be affected.

143. We already face situations where customers are inviting active network providers to bid for the supply of high bandwidth connectivity services under specific terms (e.g. relating to long term certainty of pricing and/or specific service requirements in specific geographic locations). We want the freedom to develop solutions and bid fairly to supply services to these customers without the risk that EOI would be interpreted in a way that triggers requirements to supply that same solution to any customer in any geographic area. In other words, we should retain the freedom to develop innovative solutions for customers in the same way as other active network providers. Such offers would clearly need to be 'fair' and compliant from a competition law prospective, but such an assessment would focus on the potential for any offers to have an exclusionary effect on network rivals, not on whether all other customers had access to the same terms of supply outside the bid process.

144. We note from Ofcom's assessment of the need for a non-discrimination requirement at paragraphs 11.48 to 11.51 that the focus is clearly on preventing preferential treatment in favour of downstream parts of BT, reinforcing the headline point set out at paragraph 10.3. We would also expect Ofcom to consider geographic differences and the specific nature of any bidding process in considering how to approach issues of 'equivalence': For instance, the services supplied under any specific bid may be very different to those supplied more generally – e.g. different geographic focus, different customer commitments, etc. Nevertheless, a concern remains that the EOI requirement could remove commercial flexibility.

145. Allowing Openreach the flexibility to respond to pressure from infrastructure rivals (direct and indirect) is critical to the (market-driven) dynamic Ofcom is looking to drive which ultimately delivers benefits to customers. The availability of DPA on unrestricted terms is expected to have a significant impact on competition in the supply of active business connectivity services and lead to increasing levels of competitive pressure, particularly for VHB services and in areas with high business presence where there is already alternative network build (e.g. HNR/Metro areas). While Ofcom has provisionally concluded that we hold SMP across broadly defined product and geographic markets, there will be strong competitive pressure in looking to supply certain customers in certain areas with business connectivity.

146. Given this and the strong direction of travel towards effective competition across markets, Ofcom should reconsider the need for the EOI obligation; Openreach will not have the incentive to favour downstream BT Group businesses in these segments and markets as this would make it less competitive vis-à-vis rivals. The Commitments already require Openreach to treat all its downstream customers equally. If there a specific concern that Openreach could engage in a price squeeze or otherwise act to the disadvantage of network rivals, in areas and market segments where Ofcom continues to find SMP, obligations including the fair and reasonable requirement and the no undue discrimination obligation prevent Openreach from doing so, and general competition law also prohibits such behaviour.

147. We therefore request that Ofcom remove the EOI obligation in areas and market segments where competition is expected, or that – where it finds this poses specific risks to its objectives – Ofcom is equally more specific in either limiting the legal instrument on EOI to the provision of services to downstream divisions or clarifying how it would assess EOI in the context of bids.

Requirement to supply services on fair and reasonable terms

148. Ofcom is clear at paragraphs 11.10 to 11.11 that the fair and reasonable requirement is imposed to prevent Openreach imposing a margin squeeze via the terms of supply of BCMR services. However, we are concerned that a broader interpretation could be applied in practice and this may again serve as a barrier to commercial

flexibility. We therefore ask Ofcom to confirm that the fair and reasonable obligation is limited to preventing Openreach supplying services on terms that would give rise to a squeeze on the margins of the retail providers competing against downstream parts of BT – i.e. the gap between Openreach charges and prevailing retail prices would be insufficient to support profitable supply by an efficient retail provider.

Requirements relating to requests for new forms of access: Statement of Requirements (SoR) process

149. Openreach supports Ofcom's proposed alignment of the BCMR SoR requirements with those currently in place for the WLA market. Openreach launched a new industry SoR process in April 2018 and welcomes Ofcom's recognition of the overall improvements made in the process and the time taken to respond and implement industry SoR requests.

Requirement to publish a Reference Offer (RO) for Active Services

150. The BCMR 2016 Legal Instrument Condition 5.5(a) provided a one month time period after the Condition came into force in which to publish a Reference Offer for Openreach services (excluding dark fibre). This time period has been removed (without reference) from the same condition in the BCMR 2019 draft Legal Instrument. If implemented, Openreach will now be required to publish a refreshed Reference Offer for its active services on the same day the Condition comes into force. Whilst Openreach has a concurrently running contract (Reference Offer) for its active services of EAD and Optical, any changes directed by Ofcom in the final BCMR Statement relating to our active portfolio will need to be discussed and notified to Industry and reflected in the current contract. It is not possible to do this immediately. Openreach therefore requests that Ofcom re-instate the one month time period for publication of a Reference Offer after the Condition comes into force in order for Openreach to conduct a proper review of the new Conditions, engage with industry and agree any amendments as required.

151. We have laid out our detailed comments pertaining to the timing of the dark fibre Reference Offer at Annex C to this document.

Requirement to notify changes to charges, terms and conditions

152. Openreach supports Ofcom's proposed alignment of the BCMR requirements for Special Offers with those currently in place for the WLA market. The proposed changes will provide Openreach with greater commercial flexibility to amend or extend the notification period for Special Offers going forward.

Requirement to notify technical information

153. Openreach supports Ofcom's proposed alignment of the BCMR requirements for the notification of changes to technical information involving the NICC with those currently in place for the WLA market.

Working Day Definition

154. The definition of "Working Day" has been removed (possibly in error) from the list of definitions in Annex 23, Part 2: Definitions and interpretations of the draft Legal Instrument. "Working day" is a key term in the Consultation and also contractually for Openreach and was previously included in the Legal Instruments of the BCMR 2016 and the Temporary Conditions imposed in 2017. Whilst the definition of "Working Day" remains in the definitions attached to the "Notification of Proposed Directions to BT" relating to the Quality of Service

(QoS) direction, the term has wider connotations than QoS and Openreach therefore request that the definition is re-instated into Schedule 2 of Legal Instrument.

Regulatory financial reporting

155. At paragraphs 11.112 to 11.140 in the Consultation, Ofcom proposes the imposition of accounting separation and cost accounting obligations on BT in respect of the Business Connectivity markets. It sets out the details of the obligations in a separate consultation document "BT Regulatory Financial Reporting" dated 4 December 2018. We agree that the imposition of these remedies would be consistent with the other remedies proposed for these markets, in particular the imposition of price controls and non-discrimination obligations. BT Group has responded to the separate reporting consultation. Section 5 of that response sets out BT Group's comments, with which we concur, on Ofcom's detailed reporting proposals for the business connectivity markets.

Annex A:

Comments on Ofcom's market definition and SMP assessment in inter-exchange connectivity

Contents

I. Summary

1. Ofcom's approach to market definition and SMP assessment in the Consultation marks a significant change in approach from previous market reviews. Openreach is surprised that Ofcom has carved out an artificial and new 'market' in what is supposed to be a two year transitional framework. This appears predominantly to be a means to an end, namely to introduce a dark fibre remedy. Even considering the somewhat artificial way in which upstream network services can be designated as economic markets, this particular construct is exceptionally difficult to justify in the current regime as it aligns with no understanding of access, backhaul, core or trunk network which are technologically neutral.

2. Placing an SMP obligation on Openreach for operating its own network is not a sensible way to proceed, recognising the point that in areas in access where Openreach has dominance and where at the local serving exchange there are no PCOs able to take traffic off the BT network – some regulatory remedy is clearly necessary.

3. In fact, Ofcom has never before chosen to look at the precise nature of the traffic solely within the BT network and to CP networks as network nodes are in the current methodology entirely excluded from the data analyses. What has been standard for a long time is an assessment of access and the ability of CPs to egress off the BT network from presence at BT exchanges.

4. Openreach notes that Ofcom has not undertaken any assessment of the share of IEX traffic on the grounds of administrative burden. This means that the feasibility of CPs to move traffic between BT buildings via alternative providers of backhaul has not been tested even as indirect constraints.

5. Openreach would in fact have welcomed a 'green' consultation on the whole issue of what is understood by access and backhaul which respectively might be simply defined as access to a business site or a third-party building to the handover point of egress to a CP network. Ofcom is however taking a retrograde step in this Consultation which risks fossilising the industry on BT's network in those very areas where plans are being

made to bypass the very exchanges in the more remote areas in any case. Openreach wishes to focus new infrastructures around NGA fibre access and more generally away from those BT only exchanges where Ofcom is proposing some form of dark fibre remedy although the precise scope of this remedy is not at all clear at the moment.

6. Turning to the delineation of core network or competitive egress from the BT network, Openreach welcomes the following changes made by Ofcom:

    a. Moving away from the Trunk Aggregation Node ("TAN") concept of grouped exchanges and treating each exchange as a market in its own right.

    b. The adoption of the criterion of BT+2 CPs as indicative of effective competition in backhaul and the delineation of a core network boundary.

    c. The treatment of indirectly purchased Cablelinks as equivalent to directly managed Cablelinks.

    d. The recognition of a much larger number of BT exchanges as competitive.

7. Openreach does not accept that CPs will not likely build to more exchanges especially with DPA available and the potential for further competition is greater than that indicated. Openreach estimates that in excess of 300 'BT Only' exchanges could be targeted by CPs with DPA.

8. Openreach also does not agree with the argument of attribution of SMP at BT+1 exchanges as a consequence of collusion. This is not source of attribution of market power as such and if Ofcom had such concerns for which there is no historic evidence, the proper remedy would be joint dominance. Ofcom should look at each exchange separately and provide a basis for deregulation which allows for the likelihood of a rival capturing more of the backhaul traffic than Openreach.[31] Openreach considers that any regulation at BT+1 exchanges should be very light touch and not include publication requirements.

9. Openreach notes that there are a small number of exchanges which Ofcom proposes to re-regulate[32] and requests that these be rescinded on the basis that no competition problem has arisen from their de-regulation.

II. Market Definition

A market for inter-exchange connectivity

10. At paragraph 7.2 of the Consultation Ofcom drops the historic TAN construct in favour of treating each BT exchange as in its own product/geographic market. This is the correct logical approach to market boundaries.

11. In previous market reviews, BT has consistently argued that Ofcom should treat leased line regulation as a 'single ended issue' and this would not be any different whether it is a business customer site or an operational building. What is needed is for a competitor to be able to get reasonable access to that site from wherever it has nearest network and this should be the prime focus of the market analysis. Where the connectivity from the site end goes to is a matter for remedies should these be appropriate and is not consequential on the market analysis itself.

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31 It is recognised that tenders are done for larger sets of exchanges and there is some inter-dependency then in the prices set at an individual exchange level.

32 Consultation, paragraph 7.98

12. The problem with Ofcom's definition of IEX is that it is not – and cannot be - in any meaningful way related to the schematic in Figure 7.2. This network topology is imposing a logical construct on something which is not directly helpful for market boundary purposes. The designation of a BT Access Aggregation node, a Backhaul Aggregation node and a Core node – are purely functional descriptions and may often be the same building or indeed any combination of these three functions. Other CPs will likewise have topologies which bear no relationship to that of BT and may have full rings for example.

13. Ofcom has analysed all BT exchanges sites as 'access aggregate nodes' but it is entirely co-incidental and irrelevant to the market analysis that BT has selected some of these nodes to also be 'backhaul aggregation nodes' or 'core nodes'. An immediate impact of Ofcom's incorrect treatment of the connectivity between exchanges- as opposed to the site designation- is that BT is found to have SMP in the running of its own core network when a core node happens to be co-located in a BT Only or BT+1 exchange. This is clearly wrong in principle and arises because Ofcom's framework incorrectly mixes the end location with the far end of the connectivity to the location.

14. Ofcom explicitly accepts this principle in fact and that the terms of access, backhaul, core and inter-exchange are indeed regulatory constructs. However, this does not absolve the need for there to be some basic sense in constructing them in the first place.

15. Specifically, whether the traffic that goes between BT exchanges where its designation is entirely an artifice of construction, does not necessarily align with the ability of CPs to compete for the traffic passing through that site.[33] Ofcom [7.42 third bullet] rules out calculating service share on the grounds of being disproportionate.

16. It follows therefore that:

    a. Assigning specific traffic flows between logical network activities as belonging to one market or another is entirely arbitrary.

    b. The designation of BT or indeed any CP as having market power on those routes is arbitrary.

    c. There will likely be no relationship between such markets and market power assessments and anything which the Commission has proposed in its list of relevant markets.

17. IEX is a construct which has no natural meaning. This is why, as discussed below, it is impossible to align it either with the Commission's markets, or with the natural understanding of what a core network is, or to the trunk segments which historically have been understood as the links across core networks. That BT has market power on its IEX routes but CPs do not, and that one set of routes (the former) is part of a termination market but the other (the latter) is associated with core network – are entirely *ex ante* or endogenous definitions.

[33] A circuit between two BT only exchanges could in principle be routed another way across a CP network.

Treating inter-exchange connectivity as a trunk segment

18. Ofcom [7.11] aligns IEX as part of a trunk segments market which is something the Commission [7.10] notes has been removed from the list of markets susceptible for *ex ante* regulation.

19. Ofcom [7.12] further argues that IEX connections 'between BT exchanges are part of a wider set of trunk connections' which includes trunk connections 'to and from the network nodes of other telecoms providers'. This last network component carries a presumption of being competitive 'because they are part of a telecom provider's core network, a network that can rival BT's'. The equivalent IEX connections on other CPs' networks now appear to be in a competitive 'core network' which is not actually a market under the Commission Guidelines.

20. Ofcom [7.13] now suggests that its definition of terminating segments has changed to be split into two components:

    a. End-user (if relevant) up to the BT serving exchange.

    b. BT serving exchange to another serving exchange (if relevant).

21. Openreach has considerable difficulty in following the logic of these definitions which simply raise more questions than answers:

22. It is not explained how IEX is actually part of trunk segments. What is the scope of the 'wider set of trunk connections' of which IEX on the BT network are only a part? Are trunk connections all core network or is the other way around? Do they include connections between BT network and CP networks and indeed between CP networks themselves?

23. What is the relationship between core networks and the trunk market? Are they only connections on the BT network or do they include connections on CP networks? Is it to be presumed that the former is a part of the latter but defined only from the perspective of the CP and not BT's network?

24. Ofcom's assertion that IEX on the BT network is part of a trunk market certainly does not fit a natural explanation of what stakeholders have understood a trunk market to be since 2003 i.e. something akin to long-distance core conveyance. This has traditionally been defined by the points of competitive egress out of BT's network. By definition, IEX within BT's network is the antithesis of this notion – it is anything but a long-distance notional 'core' network.

25. If there is indeed a 'market' for IEX in the way Ofcom sets out, then this cannot by definition just be that of the BT network: there must be actual or notional equivalents on CP networks as otherwise there is no market to speak of in any case.

26. The argument that the conditions of competition [7.12] should define a product market appears at odds with previous statements Ofcom's expert Katie Curry made in the Joint Experts Report to the CAT during BT's appeal to CAT on Ofcom's 2016 BCMR Final Statement ("Appeal"):

	Issue for experts' consideration	**Appellant's experts: Basalisco / Yardley**	**Defendant's expert: Curry**
24	Where it is established that demand and/or supply side constraints are strong enough to aggregate two products A and B into a single relevant product market, any apparent difference in competitive conditions in the supply of product A compared to product B is irrelevant to the product market definition.	Basalisco agrees. (Basalisco 1, §40)	Agree. It would not be appropriate to define separate markets for two products that are found to be close demand and/or supply-side substitutes, simply because observed measures of competition when defined on these products in isolation appear very different. (Curry 1 §§44 – 45, 147)
25	Where the demand and/or supply-side constraints between products A and B are unclear, apparent heterogeneity in competitive conditions across products A and B signals that the products may not belong to the same product market.	Basalisco agrees. (Basalisco 1, §40)	Disagree. For example, it would not be appropriate to adopt a market definition which excludes services which the evidence suggests are demand- and supply-side substitutes for the focal product on the basis of differences in shares of segments within the market. Differences in service shares between market segments are not informative about substitutability. (Curry 1 §§28, 44 – 45, 147)

27. In the Appeal, Ofcom in effect argued against artificial exclusion of potential competitors 'because observed measures of competition when defined on these products in isolation appear very different'. Designating BT with market power and CPs not having market power appears to run counter to this position. Ofcom [7.42] then dismisses the feasibility of undertaking a conventional SMP assessment in this notional market.

28. In essence, BT is found to have market power simply by dint of running its own network and arguably Ofcom is applying an extreme form of essential facilities doctrine.[34] It is an *a priori* finding of SMP which really has no place in the economic framework of the Directives. Put another way, it would be equally possible to start this process on a CP network and come to the same conclusion so every operator has market power on its own network.

[34] https://supreme.justia.com/cases/federal/us/472/585/

29. A final point here is that whatever classification of network components and links they have to existing or notional wholesale upstream markets, in asserting BT has market power over the services across its own network Ofcom ignores indirect constraints from other networks contrary to what is stated [4.18]. There is no assessment or even mention of this factor here and whether or not BT actually can price above the competitive level for IEX transport.

III. SMP Assessment

Approach to SMP

30. Openreach broadly agrees with the approach to SMP designation for egress from the BT network on exchanges with CP presence with some caveats. First, Ofcom does not consider a true MGA scenario where the current build vs buy decisions have led to current presence based on regulated access remedies. Second, Ofcom does not address the implications of DPA. Third, this is all without prejudice to our strong reservations about defining an IEX market as discussed above.

31. Ofcom also examines potential entry to BT exchanges in some detail in Section 12 [12.82-12.96] and for coherence this text is addressed below in addition to the limited discussion in Section 7 itself.

32. Openreach supports the approach of establishing PCOs when Ofcom is considering market power, but notes that smaller, non PCOs have invested in extending their networks to BT exchange buildings and the remedy now proposed is likely to seriously affect their business plan.

33. Openreach fully supports and strongly welcomes Ofcom's treatment of direct and indirect connections as comparable [7.57].

34. Openreach does have concerns that the published designation does not reflect the data supplied. There are a significant number (162) of exchanges that Ofcom has designated 'BT Only' where external Cablelinks are sold. Some of these may be non-PCO networks but we do not believe they all are and many are sold to [redacted] and [redacted] and so are clearly being used for fixed backhaul purposes.

35. As we cannot identify the infrastructure provider for the external Cablelink circuits we cannot count the number of different PCOs. We are unable to check Ofcom's results for the 'BT+2 or more' designations, but given the apparent scale of errors for the BT Only designations, we have concerns over the validity of these in addition.

Finding of SMP in BT only exchanges

36. Despite Ofcom stating [7.2] that it is proposing to treat each BT exchange as its own geographic market, the SMP assessment is performed on the whole cohort of "BT Only" exchanges. The finding of SMP is based on a consideration [7.64] that it is "highly unlikely that PCOs would extend their networks to the vast majority of BT Only exchanges……. The nearest PCO network is on average 6.2km away, with a median of 2.7km."

37. This consideration of all 4,327 exchanges as a single entity does not reflect the reality on the ground. A PCO's decision to build to these sites will be the same as for any other business site; it will be a balance between the "value" of the site (potential sales) and the cost of extending their network infrastructure versus buying current regulated products form Openreach.

38. DPA clearly changes the economics, reducing a PCO's network build cost, thus making it economic to build further. Whilst it may be true that the majority remain uneconomic, the introduction of a dark fibre remedy at these sites will itself also change the build/buy calculation.

39. If exchanges were considered individually, as Ofcom indicates they are each in their own geographic market, we believe that dark fibre would not be mandated at several hundred exchanges. Further, at over [redacted] of these exchanges both Sky and TTG currently are present, and so represent significant existing contestable demand for backhaul. Our analysis also shows that c.300 exchanges are within 600m of an alternative network which may well be an economic dig distance as many are also in BT+1 HNR areas. This would be greatly strengthened given the availability of DPA.

40. Finally, as stated by Ofcom [12.68] some of these exchanges are actually NGA handover points which are the locations chosen to be the long-term aggregation points for access services. These represent the sites which will have a long-term demand for backhaul services, and, in the absence of a mandated dark fibre remedy, are in any case likely to attract alternative network build.

Finding of SMP in BT+1 exchanges

41. Ofcom [7.66] suggests that in a market of two competitors there is the possibility of collusion. The potential that two players might breach competition law is not the basis of ex ante regulation nor an SMP factor more broadly. The Three Criteria Test allows for full application of competition law as it stands.

42. If Ofcom believes that BT is jointly dominant with the CPs that are present in these exchanges then the logical conclusion is to make such an SMP finding and have remedies on both parties.

43. The relevant information on Openreach service shares at these exchanges is redacted in [7.68] but the implication is in fact that Virgin Media and other PCOs have been more successful in any case than Openreach. Strictly if each exchange was its own market, then by definition one player - either Openreach or the PCO - will be putatively dominant having at least 50% market share. In practice, this is a bidding market so it may make more sense to look at the likelihood of Openreach to win contracts and derive a standard in which it is demonstrable that market power is held. It cannot be correct to always attribute Openreach with market power if for example it is less successful than average at such exchanges. As noted above, bids will not likely single out particular exchanges separately so there is some inter-dependency here.

44. Although Ofcom [7.2] puts each exchange into its own geographic market, when considering the possibility of network extension (a forward look), this appears to be done only at the level of the grouping of exchanges.

45. Further, the possibility of additional coverage [7.64] appears to be dismissed based on the average distance across the whole cohort. For the BT+1 exchanges in particular, this is quite inappropriate; the median distance [7.69] to a second PCO is only 319m which means that half of the 700 exchanges in this group are actually closer than 319m. Ofcom's own analysis in Annex 10 [A10.6] cites an economic radial dig distance is 120m (for a single 10G LA circuit and 5 year payback). However, Interexchange circuits are priced higher with a mainlink element so the economic dig distance will be longer.

46. It is also relevant to repeat at this point that these calculated distances have significant error margins. For exchanges known to have 2 PCOs already present, the average distance is 62m (median 35m) so in many cases the calculated distance will be an over-estimate.

47. Ofcom [7.75] cites that there are still barriers to entry to establishing a new presence in a BT exchange. The Openreach Cablelink product itself is inexpensive £2-£3k and extends to 50m so in fact the dig distance is shorter still.

48. The presence of the DPA remedy will further increase the economic dig distance which is explained in the BT Group response and in the report commissioned by BT Group from Alix Partners. Openreach concurs with the comments made therein. Ofcom [12.87] in fact explicitly recognises this but does not factor it in to the forward look at all.

49. In summary, Openreach considers that the potential for competitive build needs to be considered for each BT exchange to match the product/geographic definition and not at the level of the cohort. Ofcom could reasonably find a plausible combination of exchange designation, service share and/or proximity to rival networks to provide a list of BT+1 exchanges deemed competitive. At the minimum any regulatory remedies at BT+1 exchanges should be very light touch.

Treatment of BT Exchanges now re-regulated

50. Although we understand the reasoning why Ofcom wished to move away from their historic market definition, the strict enforcement of a presence test is overly severe. In 2009, Ofcom chose not regulate (as distinct from de-regulate) 85 "Metronodes" and there was a further EoI exemption for the remaining 21 Metronodes. This permitted BT to operate an efficient Core network. We do not understand the benefits of now regulating these sites given the clear difficulties it will create.

51. The 13 exchanges deregulated in the 2017 Temporary Conditions are likely to have less of an impact but we still do not understand why this situation has arisen. The selection of sites in the 2017 Temporary Conditions was based on the '2 threshold' – either 2 'direct' connections (Cablelink purchased by a PCO) or 3 'direct or indirect' connections (including purchases by non PCOs, but counting distinct PCOs. The current threshold for non-SMP is 2 PCOs and so all the sites deregulated in the Temporary Conditions should now qualify under the new threshold. We invite Ofcom to check the individual sites and reconsider.

Annex B:
Comments on Ofcom's proposed dark fibre remedy in inter-exchange connectivity

Contents

I. Summary

The case for dark fibre is not demonstrated

1. In the response to the 2017 Temporary Conditions Dark Fibre Consultation, Openreach quoted Ofcom's Chief Economist at the time of the Colt Appeal of 2013 regarding passive remedies:

'346. Ofcom has previously noted that it would need either a compelling story of either innovation or of a desire to make substantial investment in order to strengthen the case for passive remedies:

"*The combined effect of the lack of a compelling story of either innovation or a desire to make substantial investment led Ofcom not to undertake the significant work necessary to tackle the common cost recovery and potential rebalancing issues. The balance of that assessment could change in future, were evidence brought forward to strengthen the positive case for passive remedies in terms of their likely use in providing innovative services.*"[143]

[Footnote 143 Quote from Mr Culham, Ofcom, CAT Judgement in Colt v Ofcom, November 2013, para 100.]

2. What is clear in this Consultation, is that for the dark fibre remedy in IEX there is no innovation case even really being advanced by Ofcom and nor is Ofcom materially concerned about issues of Openreach tariff re-balancing or common cost recovery. Rather it is a policy statement that dark fibre may be introduced in selective areas

of Openreach networks and services on a Fully Allocated Cost ("FAC") basis which is completely different to the previous proposals for dark fibre in 2016 and 2017.

3. These proposals for dark fibre were primarily innovation based and the pricing was on the basis of a 'retail minus basis' which would potentially limit uneconomic take-up i.e. price arbitrage. Ofcom is now making a case that a FAC basis of setting the dark fibre price with CPs allowed to upgrade by bandwidth at incremental cost alone is actually inherently economically better than allowing the marketplace to set its own mechanisms for recovering fixed and common costs at the active layer. Ofcom is arguing that the elimination of the bandwidth gradient is in itself a *per se* net positive development.[35]

4. Openreach considers that far from encouraging efficient infrastructure build and competition, Ofcom's proposal will do the exact opposite. It will invite CPs to substitute 'fibre rich' for 'fibre lean' networks and facilitate inefficient investment arbitrage between active and passive pricing as well as throwing the competitive core or trunk transmission markets out of equilibrium from the unrestricted ability of CPs to take dark fibre from any exchange providing only one end is at a BT only exchange.

5. As discussed below, there is considerable uncertainty as to the intended scope of dark fibre. There is no question that this proposal will disincentivise the real infrastructure operators in the UK. In fact, Ofcom [A14.20] implicitly accepts this; if there has indeed been 'circularity from BT pricing with a bandwidth gradient which artificially induced infrastructure-based entry' - then the corollary of abandoning the bandwidth gradient must be to do the opposite.

6. If on the other hand Ofcom believes that actual entry using dark fibre is going to be limited as a highly restrictive interpretation of the legal obligation is permissible, then this begs the purpose of introducing this remedy in the first place. This is particularly relevant at this point in time when a major strategic review will take place in two years and less from the time at which it could practically be introduced.

7. In fact, the collapse of the bandwidth gradient has to have serious short and long-term consequences. This is all putting to one side the fact that as Openreach has pointed out to Ofcom, the dark fibre remedy will likely allow unfettered daisy-chaining between exchanges to replicate competitive core infrastructure as the extent of price arbitrage is significant.

8. What is evident now in this consultation is a very different framework for the supposed benefits of dark fibre even though in this consultation Ofcom [12.20-12.21] cites benefits of dark fibre from both the 2016 and 2017 consultations. The following summarises the Openreach position on the case advanced now by Ofcom.

9. First, any innovation benefits are going to be tangential in backhaul and there is no evidence that they are actually possible or material even if they are possible.

10. Second, the cost efficiencies cited by Ofcom are controversial. Openreach makes reference in this regard to a number of points made in the Appeal. We have also cited material in other submissions including the Colt 2013 Appeal where BT was supporting Ofcom against the introduction of passive remedies.

11. In fact, Ofcom does not actually appear to compute an estimate of what the equipment savings might be per circuit or for the IEX market as a whole. What is important to recognise here is that savings for economic

[35] Openreach cannot recall a comparable argument made by Ofcom in the past. As discussed in detail in the Openreach response, although current 1G EAD is now much closer to FAC than before, the bandwidth gradient is very relevant for VHB.

productive efficiency should be purely against a counterfactual of removing the electronic boxes and associated monitoring facilities and concerned only with the marginal change on that counterfactual excluding allocation of common costs.

12. In response to the Temporary Conditions Consultation, Openreach supplied detailed analysis contrasting with the rather than vague statements made by CPs which Ofcom [12.21] cites that they are 'significant'.[36] Ofcom further does not acknowledge that there is a trade-off between equipment and the costs of fault repair.

13. Third, as Openreach rejects the vast bulk of Ofcom arguments for the innovation and cost efficiency benefits, attention has to be given to whether or not the remedy will actually promote marginal access infrastructure investment or competition in access or indeed both.

14. There is no evidence this is the case and it seems highly implausible that backhaul would change the case for a marginal access infrastructure build. It is however impossible to be wholly definitive here as Ofcom has not actually explained what access markets the remedy is supposed to be assisting nor what the competition problem is in any case in those markets. Ofcom presents no evidence the remedy will facilitate marginal infrastructure build.

15. Fourth, to the extent that Ofcom is promoting competition in backhaul through this remedy, it is fundamentally misplaced. Openreach will be hampered by the full panoply of regulation whereas CPs can undercut it, meaning Openreach is prevented from competing on a level playing field. Not only that, they will be able to aggregate active circuits very easily to arbitrage against the active equivalent.[37] This is in fact highly inefficient in economic terms. Not only will it actually disincentivise backhaul competition but rather it will extend into the fully scope of core networks which Ofcom has indicated it does not want to happen.

There is a basic lack of clarity as to the scope of this remedy

16. Openreach has raised a large number of points for clarification since publication of this Consultation including the scope of the remedy and related aspects associated with the Legal Instruments. We remain very concerned about the scope of this remedy. It is also our understanding that other stakeholders have similar concerns.

17. Openreach has set three scenarios of the potential scope of a dark fibre remedy:

    a. An unrestricted scope which effectively allows dark fibre to mirror the active EAD IEX circuit (this is what Ofcom has currently proposed).

    b. dark fibre restricted to an uncompetitive backhaul segment only

    c. dark fibre provided to NGA handover points

18. It is shown that these have likely very different outcomes in terms of short and long-term impacts including the extent to which they effectively allow CPs to construct very cheap core networks.

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[36] See Annex A of the 2017 Openreach response. Openreach makes reference to the material on DFA which was lodged at the CAT in the 2016 BCMR Appeal. This has all been available for Ofcom to consider and in this context, we note that Ofcom [Annex 14 Footnote 206] cites a BT Witness Statement in support of its position.

[37] There is an issue here of contractual limitations limiting what Openreach can enforce which also arose in the 2017 Consultation.

The longer-term ramifications of this remedy are potentially serious for Openreach

19. Openreach is concerned that Ofcom has introduced a bottom up cost-based price for dark fibre rather than an active minus price in both the 2016 and 2017 Consultations. This is particularly the case now the focus in on IEX backhaul where VHB circuits might be expected for future demand in some locations.

20. Openreach is also extremely concerned about the precedent that the dark fibre proposal sets. It is not the case that it is possible to contain the impact of dark fibre to a narrow market, where as discussed above, there have been three proposals in as many years. The potential for additional and unpredictable extension of dark fibre on an average cost basis as indicated by Ofcom [12.98] could seriously undermine Openreach in the marketplace with unintended consequences of applying the same or a similar remedy to different markets.

21. Ofcom [12.27] explicitly argues that giving CPs a 'real option' to build or buy an active service is a reasonable thing to do i.e. a clear cost-price arbitrage between two functionally identical solutions. This is nothing other than an invitation to extensive cherry-picking which is unfair where Openreach is obliged to do a very high degree of averaging in pricing. It is something that Ofcom explicitly expressed concern over in the 2013 Colt Appeal and which is referenced below.

22. Ofcom is already advancing DPA as the primary upstream passive service and the requirement to offer dark fibre as well as active services under tight regulation are creating an unsustainable position for Openreach which will have to manage a common portfolio responding simultaneously to two sets of upstream remedies which will overlap. This was a position that in the past Ofcom has recognised as undesirable as shown below.[38] The fundamental lack of consistency over time on key economic principles will be of major concern to stakeholders. In particular, there appears no reason to anticipate a failure of DPA at this stage and indeed in doing so, it is almost guaranteed to do so in those locations.

Ofcom fails to assess the proportionality of the remedy against any alternatives

23. Openreach is not clear as to which downstream market is the ultimate cause of concern to make this remedy is appropriate nor why this remedy is proportionate to meeting that competition problem. In response to the Temporary Conditions 2017 Consultation, Openreach expressed the view that Ofcom's proposals failed to meet the requisite legal standard for imposing an SMP remedy.[39] In very large measure these observations remain relevant to this proposal.

24. Openreach considers that Ofcom has not properly explored what if any alternatives might be possible if indeed there is a downstream competition problem. Ofcom [Volume 2 Sections 4 and 5] sets out the calculation of the IEX charge control and associated legal tests. They do not fulfil a requirement to consider the issue of the benefits and disbenefits of introducing contemporaneous remedies in the manner that Ofcom's Chief Economist cited in the Colt Appeal referenced above. We explain below that it might have been possible to explore different active solutions for backhaul and indeed the remedy may force Openreach down that path in any case. Openreach further notes that in its analysis Ofcom has presented no evidence that CPs have expressed direct concern over the pricing of LLU backhaul, now or in the past.

25. Further, if there were some SMP failure, Ofcom has undertaken no real analysis of alternative and less radical or risky remedies. Such an analysis, however, is particularly relevant given the context of this market review being for only two years and prior to a major review of a strategic remedies. In short, if Ofcom's principal

[38] See for example the First Witness Statement 2 August 2013 by Mr Peter Culham [33-35 and 71-74] in particular.

objective is price reduction, there are less onerous remedies which could easily have been designed which would not have been highly prejudicial to this future market review in two years' time.

26. In summary and given that: (a) there is no innovation case; (b) there are downside economic inefficiencies of abandoning the bandwidth gradient; (c) there is no indication that the remedy will solve any marginal infrastructure investment; (d) the scope of the remedy is unclear; and (d) Ofcom has not explored alternatives - Openreach concludes that Ofcom fails to meet the required legal standard for the imposition of this remedy as currently drafted.

II. What is the competition problem that is being addressed?

Ofcom's changing case for dark fibre

27. In the 2016 BCMR, Ofcom set out an innovation case for dark fibre which was largely, even if not exclusively, designed for the VHB market. The focus then was particularly for MNO backhaul with Ofcom citing technical innovation including CPRI and SyncE. In fact, these are now either obsolete (CPRI) or have been resolved (SyncE). Colt asserted some possible innovation in business access for example, resale of idle capacity. BT rejected this idea on technical grounds but no significant innovation in LLU backhaul was ever asserted by any party. Ofcom's aim was to allow CPs greater choice of upgrade decisions, choice of equipment and so forth and CPs could be free from the wider Openreach product development process.

28. In the 2017 Temporary Conditions Consultation, Ofcom [3.9] restricted its analysis (and its proposed remedy) to the lower bandwidth market emphasising more or less equally: (a) cost savings, (b) innovation and (c) potential for reduction in downstream regulation. Ofcom [3.18] believed that BT could use contractual restrictions to prevent dark fibre from being used for core conveyance and for bandwidths above 1G but in fact BT had no power to do this under contract, as was explained in our response to that consultation.

29. In this consultation, Ofcom [12.5] cites four *potential* benefits for the third and different target market of IEX routes with the dark fibre remedy applying solely between BT only exchanges:[40]

    a. '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;

    b. users would be able to make efficient decisions on bandwidth upgrades based on the underlying costs of upgrades;

    c. users would be able to eliminate inefficient active equipment duplication; and

    d. users would potentially be able to deliver improvements more quickly than they can currently.'

30. These effectively coalesce into two broad categories of benefit:

    a. Innovation. Extension of choice to CPs and avoiding Openreach product development processes (a) and (d).

    b. Cost efficiencies. Cost gains roughly corresponding to allocative efficiency (b) and productive efficiency (c).

[39] Openreach response Section 5 A [277-288].

[40] Ofcom [12.16] is more definitive on this although it is qualified such as at [12.23] for certain circumstances.

31. In fact, none of these supposed benefits are really of significant importance at all but rather they are *ex post* rationalisations or justifications for the underlying aim of price reduction for IEX transmission, as Ofcom itself sets out very clearly:

> *'12.2 We propose to introduce a cost-based charge control for dark fibre services set with reference to the relevant components of BT's underlying passive infrastructure necessary for connections between exchanges. We expect the prices will be substantially lower than the current active products used for inter-exchange, though purchasers of dark fibre will also be liable for non-domestic rates (NDRs) when lighting the fibre.'* (emphasis added)

32. The underlying goal of this remedy is set out by Ofcom as follows:

> *'10.17 A dark fibre remedy on uncompetitive inter-exchange connectivity routes could significantly reduce backhaul costs (through lower backhaul prices and reduced duplication of equipment). It could therefore promote competition not only in the provision of backhaul between exchanges where there are no or insufficient competitive networks, but also, as backhaul costs are a consideration when building new access networks, could act as an enabler for infrastructure build in marginal access areas.*
>
> *10.18 We consider that the provision of a dark fibre remedy in inter-exchange connectivity would, alongside other remedies, help to reduce or remove barriers to network expansion and promote access competition in areas where BT has SMP.'*

33. It is very surprising however that Ofcom's economic case for dark fibre set out in Section 12 does not actually discuss whether dark fibre would indeed promote access infrastructure build in marginal access areas or remove barriers to network expansion and promote access competition in areas where BT has SMP. Rather the assessment is completely centred on the four factors identified above under innovation and cost efficiencies. However, the very design of the remedy as pertinent to the IEX market signals that the remedy is really a price reduction objective and not the promotion of innovation or the cost efficiencies cited by Ofcom and quoted above.

No evidence of any particular downstream market failure is identified

34. It is not clear to Openreach what downstream market or end-customers are being targeted by this remedy nor what the real downstream competition problem is.

35. Ofcom's market research conducted by Cartesian is focussed only on large businesses. Cartesian [Page 5] records that 'Overall, large enterprises were fairly satisfied with the business connectivity products and services they contracted'. Cartesian also indicates [Page 7]:

Sufficient choice of service providers, good value for money but limited infrastructure options	Both fixed and mobile markets were generally perceived to be competitive, with sufficient choice of providers offering relatively good value for money.

36. CSPs (CPs) are quoted on Page 8 of the Cartesian Report as having concerns with provisioning processes for fixed services. In this context, Openreach would refer to the high standard of performance and in large measure attainment of the mandated Minimum Service Levels ("MSLs") where CPs have expressed satisfaction in provisioning.

37. Cartesian also [Page 8] records that CSPs would like dark fibre as a cheaper alternative to active services which is the stance adopted by the PAG in their Report to Ofcom of 12th March 2018. A similar request is cited for MNOs for 5G on Page 10 of the Cartesian report. These comments are not relevant for an IEX remedy.

38. Taken overall, it is not evident that the downstream business or the CP customers are finding major issues in the functioning of the marketplace. It will always be the case that processes can be improved. That end customers would prefer lower prices or some CPs would like an upstream remedy such as dark fibre are both wholly unexceptional.

Absence of any clear exposition of innovation and cost efficiency benefits in the Consultation

39. It is assumed that the innovation and cost efficiency benefits are largely tangential to the case for this remedy. Ofcom's states [10.17] that a reduction in backhaul costs would incentivise infrastructure build 'in marginal access areas'. Here Ofcom does not specify what sort of infrastructure and to serve which types of consumers whether business or residential or indeed both are envisaged.

40. It is further asserted [10.18] that BT has SMP in such areas. No explanation is provided as to how such SMP has arisen and in pure economic terms it is axiomatic that market power is not possible for the provision of an uneconomic service; there is no competitive price level upon which to build a monopoly profit.[41]

41. There is a further difficulty here in that Ofcom quotes 'BT' as having SMP. Openreach will be obliged to offer the equivalent services and prices to downstream BT divisions in any case so this would not directly assist rival infrastructure providers who would still be competing on an end-to-end basis with the downstream arm of BT.

42. The objectives set out in Article 8 of the Framework Directive do not cite cost reduction as an objective *per se*. This is an important point as Ofcom must rely on Art 8 5. (d) in this regard of: 'promoting efficient investment and innovation in new and enhanced infrastructures …'. Openreach considers that it is not adequate here for Ofcom [10.17] to write about the objectives in relation to the Framework Directive in such general terms. There is an obligation for some precision such that stakeholders can grasp what is being intended.

43. Specifically, it is not clear whether Ofcom envisages both network expansion and competition as two separate items. If it is purely competition in a pre-existing market where there already is one player, then the lower backhaul costs would presumably be offered to both current and future operators under non-discriminatory terms as required by Art 8 5. (b). Under such circumstances it is not obvious why a reduction in input costs to

[41] Ofcom has included BDUK areas within the same geographic market as that covered by the rest of BT's local access network – Ofcom WLA Statement 28 March 2018 [3.180]. It is wrong however to make inferences from pricing to infer market power in economic areas like these as the BDUK contract terms do not really allow for any other outcome for BT due to the benchmarking provisions. In BDUK areas, BT as the contracting party is obliged to offer a range of wholesale access services (both active and passive) on non-discriminatory terms to the market. For active products this obligation extends to a period of 7 years from the original build completion date in the contract and this is typically around two years after contract start, thus the 7-year period runs for typically 9 years in total. For the passive access elements, the access obligations run indefinitely. These wholesale access products must be offered at "benchmark" prices where the benchmark is consistent with that typically available in other more competitive areas of the market. The default for this benchmark is the relevant Openreach/regulated product. This benchmarking condition therefore makes it very difficult/practically impossible for BT to charge a wholesale price in BDUK areas that is any different to the regulated wholesale price for the equivalent product in other areas. Currently these regulated prices are consistent across the UK so in effect making BDUK area prices consistent. This is where BT is the recipient of BDUK funds. BT did not win all the BDUK funds and other players including Gigaclear and Airband have received BDUK funds to build superfast networks. The same benchmarking provisions apply here but since these players do not offer directly equivalent wholesale products there is more flexibility for them to price differently to the Openreach price and which appears to be the case in practice.

all suppliers would necessarily increase competition, unless it was imagined that the overall size of the market would expand to allow more suppliers into what presumably would be a marginal area by definition.

44. The conclusion at this stage is that Ofcom fails even to make a case in principle for this remedy purely from the vagueness of the objective and lack of any transparency as to what is being sought in policy terms. The general competition concerns that Ofcom cites [10.13] do not specifically show any case for dark fibre and are in any case fail to take account of the Openreach Commitments a matter which is addressed in the BT Group response.

What are the potential markets where additional access infrastructure is expected?

45. Openreach supplies circuits irrespective of their location subject to the payment of ECCs. It does not seem plausible therefore that cheap backhaul is relevant here. A lower backhaul price would not change the average EAD prices from Openreach either. Nor would it affect the incentives of Virgin Media to extend their network for business access services. It is assumed therefore that Ofcom did not have business access in mind here.

46. Likewise, there is no suggestion that MNOs require a cheap backhaul service to roll out 5G services for marginal areas where there are explicit requirements in any case.

47. This leaves consumer broadband as the only potential candidate where Ofcom considers that cheap backhaul might incentivise marginal infrastructure build. Ofcom provides no evidence of the materiality of this. Nor is any evidence provided that current services are experiencing difficulties from the cost of IEX backhaul.

III. The benefits of dark fibre cited by Ofcom are illusory

Choice over active equipment

48. Ofcom [12.7-12.8] suggests that additional choice is possible here with dark fibre. However, Ofcom [12.9] appears to largely discount these benefits recognising that the dark fibre proposal is not in the access network in any case and (notionally) limited in terms of the routes on which it is actually available.

49. In terms of purchasing of transmission equipment, the simple fact applies that this is standardised as part of a world market. Specifically, in the 2017 Appeal, Ofcom's Expert Mr Matthews in the Joint Experts Report [Table 1 1c)] discounted the importance of equipment innovation:

Table 1

Effects that may lead to benefits

	Mr Matthew's view	Dr Maldoom's view
1c) Whether first mover advantages are relevant to innovation benefits	Dark fibre will create scope for CPs to seek competitive advantages over their rivals in terms of lower cost and/or better or differentiated services, which can be expected to yield innovation benefits. First mover advantages are one means of	Most innovations discussed by Ofcom are easily replicable by others, with technical innovations relying on availability of equipment from upstream suppliers that is similar for all CPs. (Maldoom 2, §78)

	achieving such competitive advantages. Agree that dark fibre is unlikely to have a significant impact on the evolution of global industry standards in terms of available equipment, but that is not the sort of innovation that is expected. (Matthew 1 §14).	Equipment availability is largely globally determined and mostly unaffected by UK-specific

Service feature innovations may be easier and quicker to introduce

50. Ofcom here [12.28] appears to allude to the Openreach Statement of Requirements process but no analysis of this is provided in this Consultation. This issue was analysed in detail in the Witness Statements of Mr Alan McGuire and Mr Andy Reid in the 2016 Appeal. There is no suggestion here in this Consultation that there is any failing on the Openreach side.

51. Ofcom [12.29] acknowledges that here the partial implementation of dark fibre will likely limit innovations which might theoretically have been possible in the access network.

52. Openreach is of the view that there is nothing in IEX transmission which remotely fits the descriptor of 'easier' service innovation and cites the acceptance of this by Mr Matthews in the extract of the JER shown above.

53. As for speed of upgrade, this was never likely to be a material issue. As was set out in the 2016 Appeal, network upgrades are planned in advance and whether this is done by the CP using dark fibre or by Openreach putting in an active service will be immaterial in practice.

Inefficient equipment duplication reduced

54. Openreach disputes the assertions made here. First, as is explained in detail in evidence to the CAT for the purposes of the Appeal, a primary purpose of the Openreach equipment is to facilitate Openreach operational processes and operational performance (for example repair times) and reduce overall operations costs. There is no simple way for any CP's equipment to replicate this function. Even if the equipment has the same monitoring capabilities, which will not be the case many of the scenarios where the Openreach equipment is replaced by SFPs as described by Ofcom [12.20], the CP's equipment management interface is not connected to the Openreach operations centre and this is essential to maintaining the operational efficiencies.

55. Ofcom [12.55] makes reference to the previous dark fibre reference offer noting that this included a repair process. What Ofcom does not acknowledge nor give weight to is the fact that it is apparent in this Reference Offer that the absence of the Openreach equipment results in significantly different repair processes and different repair targets to Openreach's active products.

56. Indeed, Ofcom does not acknowledge or address the evidence presented to the CAT in regard to dark fibre here. We note that when Ofcom addresses the impact of dark fibre on operational processes [12.52-12.57] there is no reference whatsoever to BT's evidence to the CAT.

57. Ofcom does acknowledge the issue of faults which are 'right when tested' (RWT) [12.56] and states that, 'Openreach can also incentivise providers to make efficient decisions on repair through an appropriate call-out charge where a fault is incorrectly diagnosed'.

58. This would further suggest that Ofcom has not given proper consideration to the evidence that BT presented to the CAT:

    a. Openreach already has the power to charge for call-out following incorrectly diagnosed faults.

    b. Despite this power and even with reliable in-service monitoring of current active services, this results in roughly 50% of fault reports being RWT and then, despite the RWT report from Openreach operations, CPs request a call out in roughly 20% of these cases.[42]

    c. Openreach has little expectation that 'an appropriate call-out charge' will have any material impact on the rate of RWT events.

    d. Conversely, with dark fibre Openreach expects the number of difficult and/or disputed faults will rise considerably.

59. As set out above, Ofcom ignores the impact on operational costs of removing the Openreach equipment under a dark fibre remedy. However, even the asserted capital savings are overstated and illusory.

60. The quoted by Ofcom [12.17] of "approximately £573 (23%) of costs" implies this is the avoidable cost of the Openreach equipment or the incremental change as set out in the Summary above. However, and as set out in detail below, the calculation is based on BT's regulated accounts which include cost apportionments which are not appropriate for the calculation of avoidable costs and considerably overstates the actual level of avoidable costs.[43]

61. Moreover, the proposed dark fibre remedy applies only to IEX from a BT Only exchange and this calculation is based on all EAD circuits across all sectors and is not necessarily indicative of avoidable costs in this narrow sector.

62. The scenarios discussed by Ofcom [12.19-12.22 and Figure 12.1] draw on examples from the 2017 dark fibre consultation. This Consultation related to a dark fibre remedy restricted to 1G and below. There are significant technical and cost differences between equipment and optical plug-ins with this situation, at least looking further ahead. For example, generally the 'small form-factor pluggables' (SFPs) are only compatible with 1G and below and a different pluggable is required for 10G or above, for example an XFP.

63. Importantly, for the current case of dark fibre for IEX, Ofcom has not considered the difference between 'transport' equipment which is directly oriented to the lighting of the fibre and the maintenance of optical signals across the fibre from 'switching and routing' equipment which is oriented to the switching and routing of packets.

64. Generally, 'transport equipment' is transparent to the packets while switching/routing equipment is not enabled to carry out the maintenance of optical signals across long distance fibre. The interfaces on switching/routing equipment are normally designed for cheap 'across the floor' pluggables which are not capable of making use of dark fibre. Some vendors of switching/routing equipment may supply pluggables for long-range optics

42 Second Witness Statement 16 January 2017of Mr Alan McGuire Tables 2 and 3.

43 The 2017/18 RFS Ethernet Electronics Capital component includes £391 for installed equipment.

compatible with dark fibre but they very often charge a considerable premium compared to those compatible with transport equipment.

65. This means that contrary to Ofcom's brief analysis, in the absence of Openreach's equipment which will intrinsically interface between the long-range optics and optical signal maintenance and the cheap 'across the floor' interfaces of switching/routing equipment, the CP is faced with a choice between directly replacing the Openreach transport equipment or paying the premium for long-range optical equipment compatible with the switching/routing equipment. There may also be a further addition licence cost for software to manage the optical signals across the fibre even if the functionality is available.

66. In summary, the potential savings are likely substantially lower than given by Ofcom and it is unlikely that any practical deployment scenarios will actually even achieve these savings.

Ofcom underplays the roles of EBD and Optical Filter Connect

67. Ofcom [12.49-12.51] appears not to recognise that the existing Ethernet Backhaul Direct (EBD) shared backhaul product is based on legacy high cost technology which has been superseded by modern DWDM equipment and technology and as such has limited scope for price reductions without an expensive technology refresh (for which the proposed remedy removes any economic case).[44]

68. Ofcom [12.32] discounts the benefits of Openreach's Optical Filter Connect (OFC) service. OFC was launched in April 2018 and provides low cost scalable backhaul for Communication Providers and enables the provision of modern cost-effective wholesale backhaul services.

69. Ofcom [12.32] asserts that OFC is inadequate as it is unnecessarily expensive due to the inherent cost within the product if a CP does not require more than 10G. This ignores the fact that Openreach does not charge higher rentals for OFC compared to 10G only a higher connection charge to reflect the cost of filters and the like. Where a customer only wants a bandwidth up to 10G and has no plans to go above that level, the EAD 10G service is entirely suitable. If there is an expectation of going above the 10G in the future then the OFC solution is equally viable.

70. This is the same choice for a CP taking dark fibre; who, if they believed they required more than 10G in the future, would install a filter (the additional component driving cost of Openreach OFC over EAD 10G) as they would not want a network outage when they came to do the upgrade itself. Ofcom [12.32] is wrong in assuming that dark fibre gets around this strategic choice decision.

71. A number of Openreach customers are ordering and/or designing backhaul networks to new locations based upon OFC despite facing a typically long investment cycle in network infrastructure. Openreach believes Ofcom's proposed remedy will unintentionally cut short the economic value and market growth opportunity related to OFC and current innovation in terms of developing solutions for network solutions such as rings and chains.

72. In summary, Ofcom has not demonstrated failings in the availability of competitive active products from Openreach and the reasoning in the Consultation is mistaken and does not take into consideration the current Openreach portfolio and pricing which already provides the benefits Ofcom is claiming for dark fibre.

[44] EBD was never originally designed as a product to be sold wholesale in any case it was a network solution for 21CN which never materialised.

IV. There would be significant downsides to dark fibre

Cost of upgrading to reflect the underlying cost: impact on efficient cost recovery

Issue 1: The bandwidth gradient and de-averaging

73. Ofcom [12.13] makes the strong assertion that dark fibre 'ensures more efficient upgrade decisions based on true incremental costs'. Ofcom goes even further [12.42] to assert that allocative efficiency is enhanced by removing the bandwidth gradient by bringing prices closer to costs particularly for VHB services.

74. Ofcom [12.12] appears to base its assessment on a 'first-best world' in which the underlying infrastructure which would actually permit CPs to do this upgrade is already in place and entirely separate from the decisions made by CPs subsequently. However, Ofcom's own Critical Sales Loss analysis in Annex 8 accepts that marginal costs are much lower than average costs.

75. There is a more fundamental objection to Ofcom's claim [12.42] of an improvement in economic efficiency. The purchase of all of these upstream services is in a wholesale market (when they come out of Openreach at least). Ofcom's objectives relate to consumers or end-users in the Framework Directive not of producers.[45] There is no direct translation of a first-order economic efficiency at the upstream level to the downstream level absent very strong assumptions for example on common costs and the relationship between wholesale and retail tariffs.[46]

76. There are many possible ways of allocating out common costs and different forms of FAC would provide different benchmarks for a fibre strand. Ofcom has no evidence that its pricing solution is welfare superior to the current tariffing arrangements with an element of bandwidth gradient and the widespread practice of forms of Ramsey pricing.

77. There is another fundamental objection here. It has been established wisdom in all regulatory sectors that market players are better able to sort out optimal tariffing structures than regulators. Ofcom's Chief Economist Mr Peter Culham (first Witness Statement 2 August 2013) set this out extremely clearly:

> *22. Ofcom has not set prices for individual leased line services. It has taken a basket approach to the regulation of these services, allowing BT to set the detailed pricing structure. It has taken this approach because it believes that BT has good incentives to set a pricing structure that will cover the common costs in a reasonably efficient way, as it has an incentive to expand output under the basket price control approach. Ofcom has taken the view that BT id likely to do at least as good a job of setting efficient prices as Ofcom would be likely to do itself, given BT's better information on customer responses to prices.*

78. In his First Witness Statement in the Colt Appeal, Ofcom's Chief Economist also stated the following [26-27, 37-39], covering the likely benefits of a bandwidth gradient and the downsides of de-averaging from selective entry:

> *26. Cost recovery through the current type of tariff structure for leased lines is in principle likely to be efficient. A bandwidth gradient that is positive but declining in bandwidth is likely to be a better way*

[45] The Expert Report by the Ofcom DoE of 17 November 2016 appeared to simply aggregate end-users and CPs who were purchasing backhaul services see last sentence of Paragraph [54].

[46] See the discussion on the issue of double marginalisation in the Report of Mr Andy Reid of August 2015.

of recovering common costs than a pricing structure which has a uniform bandwidth gradient. The current gradient has the advantage of allowing the marginal price of bandwidth to get closer to its marginal cost than would a gradient that reflected average costs.

27. A gradient that reflected only the marginal cost of bandwidth would require that the fixed and common costs were either ignored or loaded equally onto circuits of all bandwidths. The former approach would be inconsistent with the opportunity to recover efficiently incurred costs, while the latter would result in customers of low bandwidth services being deterred from purchasing. The adoption of a positive but declining gradient is a potential solution to this, and Ofcom believes that a gradient of this type is likely to be efficient. This is analogous to the standard result in economics that second-degree price discrimination is an efficient pricing structure in the presence of fixed and common costs.

37. As I have noted above, there are more circuits and a greater bandwidth requirement in some areas than in others. I also explained that tariff structures have been established to recover common costs via a bandwidth gradient that is steeper than the marginal cost gradient. A direct consequence of these two features of the tariff and cost structure is that some geographical parts of the network contribute a larger amount towards the recovery of common costs than others.

38. Such different contributions to the recovery of common costs do not necessarily constitute a tariff structure involving cross subsidy. If for the reasons explained above overall infrastructure costs are regarded as common across all areas, the test of cross subsidy is whether any service is priced below the level of its incremental cost, when that is assessed on a national basis. This is not the case to any significant extent in BT's current tariff structure.

39. It is possible that there is some geographically based cross subsidy in the tariff structure, with areas of greater usage intensity contributing to common costs to the extent that total revenues exceed the stand-alone costs of providing service in those areas. Ofcom regards geographical averaging of tariffs as generally positive and it does not usually seek to establish pricing arrangements which vary across areas. De-averaging (e.g. as in the Wholesale Broadband Access markets) may be a consequence of the promotion of competition which is more successful in some areas than in others, but it is not a regulatory objective which Ofcom would normally seek to promote in and of itself.

79. In his Second Witness Statement of 30 September 2013, Mr Culham re-iterated Ofcom's position on the benefits of the bandwidth gradient as follows:

36. I would also take issue with the description of Ofcom's judgement that there are benefits from price discrimination of the type represented by the bandwidth gradient as an "assumption". I would describe Ofcom's view as one which is well-supported by the relevant economic literature. As I noted in [Culham1], this bandwidth gradient is a form of 2nd degree price discrimination, which is commonly agreed to have positive effects on economic efficiency, especially where there is a need to recover large common costs. (emphasis added)

80. Ofcom is now intervening in a very restrictive manner to impose highly restrictive pricing solutions which go entirely against the grain of that principle of leaving the market to sort out relative prices itself. In the 2016 Appeal, the Joint Expert Report [18-20] records the following position with respect to pricing flexibility:

Benefits of pricing flexibility

18. There was agreement with the theoretical principle that there could be allocative efficiency benefits from allowing BT some flexibility in setting the prices of active services at different bandwidths in order to recover BT's costs more efficiently. These efficiency benefits could be manifested by

allowing a larger volume of services to be consumed than might otherwise have been the case. There was also agreement that the existing pricing structure does not need to be theoretically optimal in order to deliver benefits relative to a flat pricing structure (i.e. equal gross margins on services at different bandwidths), and that Ofcom has previously given BT pricing flexibility in recognition of these potential benefits (Matthew 1, §§26-31).

19. While accepting that using a bandwidth gradient to recover BT's costs may have allocative efficiency benefits relative to a flat pricing structure, Mr Matthew considers that there are other relevant factors at play. For example, if the counterfactual to the introduction of dark fibre was that VHB prices were not constrained by regulation, introducing dark fibre might improve allocative efficiency relative to that counterfactual. On the points raised by Dr Maldoom in the following paragraph, Mr Matthew does not consider that the dark fibre remedy distorts incentives for competitors to invest in full infrastructure – see Section 5.

20. Dr Maldoom considered that dark fibre forms a general constraint on the ability of all infrastructure-based CPs (not just BT) to price discriminate, in that any pricing structure that sets different gross margins for different services could face competition from DF on the higher margin service. He considered that this economic logic was evident in some of the statements about the commercial impact of dark fibre made by the infrastructure-based CPs. Erosion of margins earned from VHB services was a specific example of this phenomenon that could have very significant effects on infrastructure investment incentives. He considered that Ofcom should have considered this as an explicit cost of introducing dark fibre, but that Ofcom did not do so. (Maldoom 1, §§28-30)

21. Therefore, there was little agreement about significance of pricing flexibility. The disagreements are recorded in the table below.'

81. In summary, on the issue of the bandwidth gradient Ofcom has not been able to provide any 'sense check' to justify the assertions of economic efficiency and the requirement to do so at least in the generality on a key issue like this was emphasised by the CAT in the Judgement on BT's Appeal [303]. In order to ensure it is imposing the least onerous remedy necessary to solve the competition concerns it has identified, Ofcom must demonstrate that commercially-based pricing is wrong and the regulated system of charging is better.

Issue 2: Regulated dark fibre creates inefficient incentives which actives and DPA do not

82. In its response to the 2015 BCMR Consultation,[47] BT provided detailed evidence and analysis of the impact that the pricing of upstream services has on the choice made by downstream operators of their network structure.[48] At the time this analysis focused on the comparison between:

a. An efficient vertically integrated operator who knows the fixed and variable components of both upstream and downstream cost elements.

b. A downstream operator purchasing active upstream products which and a marginal price of bandwidth i.e. a bandwidth gradient).

c. A downstream operator purchasing dark fibre where there is no marginal price of bandwidth.

47 Ofcom's Business Connectivity Market Review 2016 Consultation, published on 15 May 2015.

48 See BT's response to Ofcom's consultation document "Business Connectivity Market Review: Review of competition in the provision of leased lines", *Efficient Network Structure and the Provision of Dark Fibre under Regulation*, dated 20 August 2015, available at https://www.ofcom.org.uk/__data/assets/pdf_file/0027/81396/bt_efficient_network_structures_and_passives_final.pdf.

83. The analysis showed that the absence of the bandwidth gradient was likely to drive a radically different network structure (fibre lean) from that which would be chosen by efficient vertically integrated operator of the operator purchasing active services (fibre rich).

84. The analysis when on to show that a downstream CP purchasing active products with a bandwidth gradient will also find it optimal to build a similar 'fibre-rich' network structure and overall productive efficiency of the industry is maintained. However, a downstream CP purchasing dark fibre with no bandwidth gradient would not make the same choice and would favour multiplexing/switching equipment over fibre strands and would drive a radically different network structure (fibre lean) from that which would be chosen by efficient vertically integrated operator or the operator purchasing active services. In essence, from the perspective of overall productive efficiency for industry, under regulated dark fibre, the industry would inefficiently purchase multiplexing/switching equipment over fibre (and indeed some of the fibre may be left as stranded assets).

85. Ofcom has not offered any engagement with this issue and the statement in this BCMR consultation that dark fibre is somehow efficient, as discussed in Issue 1 above, does not address this issue of the productive efficiency associated with downstream network structure.

86. The fundamental inefficiency of dark fibre can now be seen further by considering a new scenario based on the Ofcom's strategic proposal for DPA.

87. It is now possible to extend the analysis of network structure choice by downstream CPs using a fourth scenario of the downstream CP purchasing DPA. In this scenario, the following will be the case:

    a. The price of the DPA will have no bandwidth dependency (as with dark fibre).

    b. The overall cost of installing a fibre cable based on DPA is very largely independent of the number of fibre strands in the cable.

    c. The marginal cost of using a fibre strand from the cable, once laid and up to the point of exhaustion of the fibre strands, is very low.

    d. This once again drives an efficient 'fibre rich' network structure for the downstream CP.

88. This new scenario based on DPA provides a clear demonstration of the inefficiency driven by dark fibre. The issue is that regulated dark fibre with mandated price controls does not allow the marginal cost of fibre strands on the same route to be reflected as a marginal price and this major discrepancy between marginal cost and marginal price drives a dramatically different network structure with associated productive inefficiency. Conversely, in the case of DPA, as in the case of the vertically integrated operator, the downstream operator can see the marginal cost directly.[49]

89. Ofcom's current proposal targeted for the most part at small rural exchanges compounds the inefficiency with significant de-averaging of the utilisation of duct by fibre. With EAD, the Mainlink price is based on average utilisation of fibre in duct. However, with rural exchanges this utilisation is much lower and therefore the actual price needed to recover the costs of rural duct is higher than average. Therefore the average backhaul fibre costing for pricing dark fibre in these areas as proposed by Ofcom will give a further inappropriate incentive to purchase dark fibre (with which CPs will use multiplexing equipment) over more efficient solutions including duct access or the use of multiple fibre strands.

[49] DPA does generate a number of other complexities of cost recovery and inefficient incentives resulting from averaging in regulated pricing which are not discussed here.

90. In these circumstances of rural exchanges, we would expect dark fibre pricing to be comparable to or above DPA pricing, even for a single strand. In fact, Ofcom's proposed pricing is substantially lower based on the wrong assumption of utilisation of fibre in duct.

91. In summary, in terms of driving a choice of downstream network structure, dark fibre is a uniquely inefficient solution.

Issue 3: Economic efficiencies depend ultimately on a retail response to prices

92. The precise distinction between the three traditional economic efficiencies (allocative, productive and dynamic) are often not regarded as always distinct. As discussed above, allocative efficiency may arise if it can be demonstrated that there is a comparable willingness to pay for that incremental capacity in the true downstream retail market and other very strong assumptions. These seem highly unlikely here and Ofcom has not investigated the impact of the bandwidth gradient in true downstream markets.

93. Nor is there any evidence or any certainty that the LLU backhaul CPs will pass on this windfall gain to their consumers. To the extent that they do, this will in fact discourage the migration off copper broadband onto fibre broadband effectively entrenching a legacy technology.

94. Ofcom [12.40] notes that "the evidence" suggests that current pricing is restraining demand. However, Openreach notes that Ofcom is in fact unable to provide stakeholders with an accurate assessment of the basic stock of circuits in the marketplace, let alone any changes to the stock and even less any causal effects on any changes as a result of pricing. Ofcom has provided no price elasticity assessment in this Consultation and cannot objectively support the statements made. Further, the final sentence of [12.40] is unjustified as both VHB and lower bandwidth services share substantial common costs and in these circumstances, it is not meaningful to assert that one by itself "recovers costs" independent of the other (see Issue 3 below).

95. Ofcom's [12.41 first two bullets] comments on the bandwidth gradient focus on the relationship 100M and 1G. However, Ofcom's own assessment of the product market finds a likely economic market just at 1G and definitely a break between 1G and 10G. In any case, Ofcom is looking at prices where Openreach is regulated in a single basket and has to balance its options not only within the EAD portfolio but also against other services which Ofcom has not considered here including shared fibre products. While there is a case to say that the bandwidth gradient is reducing between 1G and 100M there is a clear break between 1G and 10G. The closing of 100M and 1G had a parallel in previous years between 100M and 10M reflecting product lifecycle as in fact Ofcom itself acknowledges [A7.7 and A14.8].

96. An appropriate analysis would not just consider pricing differentials unconstrained by regulation for example by considering demand elasticities of different products - it would also reflect the fact that the products are wholesale products and would include the indirect pricing constraints by considering the interaction between upstream and retail markets.

97. Ofcom [12.41 third bullet], in quoting Openreach documents, actually reinforces the point that a key driver of 10G pricing has been to remain competitive in the marketplace. This was precisely the point made by the CAT in the 2016 Appeal and that this was not indicative of pricing interdependence – Judgement [201-222]. The other documents merely confirm that 100M and 1G will become closer which is the lifecycle point discussed above.

Issue 4: The FAC calculation of the dark fibre price

98. The price of EAD 1G active services are close to FAC which is apparent from the fact the LLCC for the 2017 BCMR has completed at close to FAC, supporting a flat charge control in the 2019 BCMR even if not explicitly modelled. This means that whether a price is set for dark fibre that is EAD 1G active minus (as in the 2016 and 2017 Consultations) or at FAC using the EAD 1G cost stack as a starting point, a similar result should be reached.

99. However, with the exclusion of active fibre costs from the dark fibre cost stack, dark fibre prices are very low compared to the EAD 1G product which reflects the average cost across all use cases and which therefore includes access links. [redacted]

100. For VHB services however, which are likely to reflect some of the future demand in IEX routes, the scope for price arbitrage is very significant. The extent of opportunity for price arbitrage is considerable and the following gross margins between dark fibre and EAD/optical are calculated at an assumed mainlink distance of 13km:

    a. At 1G. Rental saving of around 53%.

    b. At 10G. Rental saving of between 70%-73% for 3 year and 1-year terms.

    c. OSA. Savings in the range of 70% - 79% depending on term and whether single or dual fibres.

101. The very nature of fully allocated cost (FAC) accounting is to deal with costs which are common across two or more products and has the objective that these common costs can be fairly recovered. However, FAC does not give insight into avoidable costs. The analysis of the impact and efficiency of the bandwidth gradient requires an analysis of avoidable costs and the use of FAC is of little assistance in this regard.

102. Ofcom's assessment of both the cost difference between the different bandwidth EAD products as well as Ofcom's comparison with the costs underpinning the proposed IEX dark fibre pricing is based on the FAC based regulatory accounts. Openreach had already given detailed critique of the difference between the FAC calculation and an avoidable cost 1G EAD and dark fibre in its response (Annex A) to the November 2017 Dark Fibre Consultation. That analysis dealt with the narrow issue of avoidable costs associated with removing the electronics and even in this narrow context showed that the true avoidable cost was dramatically different to the FAC calculation (FAC calculation gave £584 p.a. whilst the truly avoidable cost was only £119 p.a.).

103. This time, however, the context is much broader as Ofcom has not taken the fibre cost allocation on a like-for-price like basis between active and dark fibre. Now there is a very substantial price difference between the active price and the dark fibre price based not on actual cost differences but on the different allocation assumptions between the active product and the dark fibre product.

104. Mr Culham in his first Witness Statement was clear on the danger of arbitrage:

> *71. The first condition is that there should be consistency between the remedies at different levels, particularly in relation to the way in which services at the different levels are priced. Failure to do this is likely to introduce arbitrage opportunities and inefficiencies in production and consumption decisions.*

and further:

> *74. I understand Ofcom's main concern in the current case to be with the first point developed here, that the way in which a passive remedy would be priced, indeed would have to be priced for reasons of practicality, would be in potential conflict with the way in which the active remedies were priced. That seems to me to be a well-founded concern.*

Issue 5: There will be inefficient equipment purchase from aggregation opportunities

105. Ofcom [12.45-12.51, 12.61-12.62] identifies opportunities for substitution of active circuits for dark fibre. Importantly, in the direct discussion on arbitrage, Ofcom fails to recognise or discuss any arbitrage opportunities enabled by removing the bandwidth gradient. The only discussion is between the distance-related pricing of EAD and proposed dark fibre with the non-distance related pricing of EBD. In fact, the risks of the former are very real whilst any real risks associated with the latter are illusory as EBD is simply not available at most of the sites in question as noted by Ofcom [12.50].

106. In addition to the simple arbitrage based on the different cost allocation assumptions under regulatory accounting highlighted under Issue 2 above, Ofcom fails to identify the risks from consolidation. In our response to Volume 2 of the Consultation, we discuss the scenario that a CP will consolidate its own demand on a route into a single dark fibre, but the main opportunity is for one CP to offer a wholesale service using multiplexing for other CPs across a single fibre strand. The ability of CPs to do this entirely arises from Ofcom collapsing the bandwidth gradient from the introduction of dark fibre. It is a direct inefficiency leading to stranded fibre in the Openreach network. BT has raised this issue in detail on a number of occasions including:

    a. In the May 2015 BCMR Consultation.[50]

    b. In the 2016 Appeal.[51]

107. Openreach therefore believes that Ofcom's [12.48] conclusion is wrong and where Openreach currently has three active circuits for the large downstream CPs (including downstream BT divisions) it would likely end up having just one much lower revenue instead of three active circuits.

108. It is important once more to stress the difference between avoidable costs and allocated costs. This arbitrage opportunity arises because Ofcom assumes that the allocated cost of a fibre strand is reflective of its avoidable costs. This is evident from the erroneous analysis in [12.43-12.48]. Ofcom asserts that the risk of stranded assets is 'low and mainly limited to the active layer'. Ofcom fails to realise that it is constructing the opportunity arbitrage the avoidable cost of bandwidth with the allocated cost of fibre strands. In fact, the avoidable cost of fibre strands is normally very low and dramatically lower than the allocated cost. A proper comparison of the avoidable cost of bandwidth with be avoidable cost of fibre is likely to yield a dramatically different result.

109. Conversely, there are currently some local exchanges where the fibre strands are currently all in use and here the marginal cost of introducing dark fibre is the cost of laying a completely new cable. In this case, a multiplexing solution would be the most cost-effective solution; however, the mandating of dark fibre will force the cost of additional cable build onto Openreach.[52]

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50 See the BT Response of 11 August 2015 Section 17 and the Paper by Mr Andy Reid of August 2015 'Efficient network structures and passives'.

51 See the second and third Witness Statements of Mr Andy Reid.

52 Ofcom has explicitly excluded the opportunity for Openreach to recover this in charges.

110. The situation in practice may be worse than this scenario as it is most likely that the CP will order the dark fibre in addition to existing their active products which they will only cease when they have fully tested their service using the dark fibre. Given the small number of fibre strands actually needed at a BT only exchange, it is quite likely that once the active products are ceased, the number of lit strands will then be less than the number in the existing cable and the new cable is completely superfluous to requirements for the exchange. This is clearly highly inefficient.

111. The true incremental cost of fibre strands, depending on specific utilisation levels on a specific route, therefore is either extremely low or extremely high. In neither case is an allocated average cost as used by Ofcom remotely accurate.

112. Ofcom also fails to appreciate or reflect the fact that aggregation by aggregating fibre strands in a cable can be - and often is - the most efficient means of aggregation and obviates the need for multiplexing equipment. As such, Ofcom has failed to reflect how the risk of stranded fibre assets can arise rendering the discussion in [12.43-12.48] otiose.

113. Finally, it is evident that the regulated price of dark fibre is significantly below the likely commercial price [A.8.69] although the margin is impossible to state as Ofcom has redacted the relevant information.

Different interpretations of the scope of the proposed dark fibre remedy

(i) Three scenarios for the scope of the dark fibre remedy

114. If it was clear what the competition problem was which dark fibre was to solve, it might be possible to translate this to what might constitute the scope of reasonable access remedy in terms both of technical and economic viability. Given the nebulous explanation presented in this Consultation as to the real competition problem, no such comfort is provided.

115. Openreach has therefore produced three possible interpretations or scenarios of what the scope of a dark fibre remedy might be that Ofcom is intending to impose[12.1] assuming that at one end of the dark fibre there is a BT only exchange:[53]

- Scenario 1. An interpretation following the definition of IEX between BT exchanges as illustrated by Ofcom in the Consultation Figure 3.2 and Figure 7.2 where 'backhaul' and 'core' are essentially indistinguishable and combined. This is limited to the BT network alone with no particular consideration to the CP network. This is the scenario and scope that BT understands is currently proposed by Ofcom in the Consultation.
- Scenario 2. An interpretation of a 'backhaul segment' as being distinct from a 'core segment' where the emphasis is on addressing where the asserted difficulty is now that of 'competition concerns in backhaul' rather than 'competition concerns relating to the costs associated with core infrastructure'.[54] This implicitly considers the requirement for egress from the BT network via handover to the CP network and thereafter it is assumed to be core infrastructure.

[53] Scenarios 2 and 3 take a wider view as to what a scope Ofcom might be intending beyond the literal reading of the Consultation document and the Legal Instruments to explore what Ofcom might have had in mind for this remedy.

[54] Consultation, Footnote 349 as revised on 19 December 2019.

- Scenario 3. Dark fibre supplied to be provided from any BT Only exchange to its parent NGA handover points. This is focused more on the strategic direction of the industry especially the sustainable handover points under NGA services.

116. Each of the Scenarios is considered in the context of three generations of consumer access of LLU, FTTC and FTTP, and also of access to business sites where a consumer service or adaptation of a consumer service is inadequate and served with a dedicated direct fibre (typified currently by the requirement for an EAD access).

117. The scenarios developed below with their possible implications for the marketplace are explored along with associated development timescales. The key point is that all of them have considerable difficulties and none could be considered a proportionate remedy to the market problem. Moreover, they are not compatible with each other in the main and Openreach cannot pursue one Scenario with one CP and another with a different CP.

(ii) The Ofcom classification of BT exchanges

118. In Table 7.1, of the 5573 BT local exchanges (the 'access aggregation nodes' in Figure 7.1), Ofcom identifies 4327 as BT Only, 701 as BT+1, and 545 as BT+≥2 (or more). However, with a very few exceptions, the 'backhaul aggregation nodes' and 'core nodes' identified in Figure 7.2 are also simultaneously BT local exchanges.

119. The location of BT+≥2, BT+1, and BT Only exchanges are plotted by Ofcom in Figure 7.4.[55] The general location of these three categories is very striking:

- The BT+≥2 are strongly biased to the major conurbations.
- The BT+1 are also concentrated on the major conurbations, other cities and larger towns, especially when they are close to the major conurbations.
- While there are some BT Only in the urban areas, many serve the smaller towns, and the great majority of rural exchanges are BT Only.

120. In essence, competitive presence in a BT exchange is strongly correlated with the scale of services served from that site (and hence "value"). However, this also suggests that the presence of competition at a local exchange is not directly indicative of the status of the exchange i.e. the BT aggregation/switching hierarchy which might identify an exchange as being a 'backhaul aggregation node' or a 'core node' as identified in Ofcom Figure 7.2.

121. Moreover, there are a number of other important ways in which BT local exchanges may be classified which have a bearing on the efficacy, proportionality, and associated risks of the dark fibre remedy. These include:

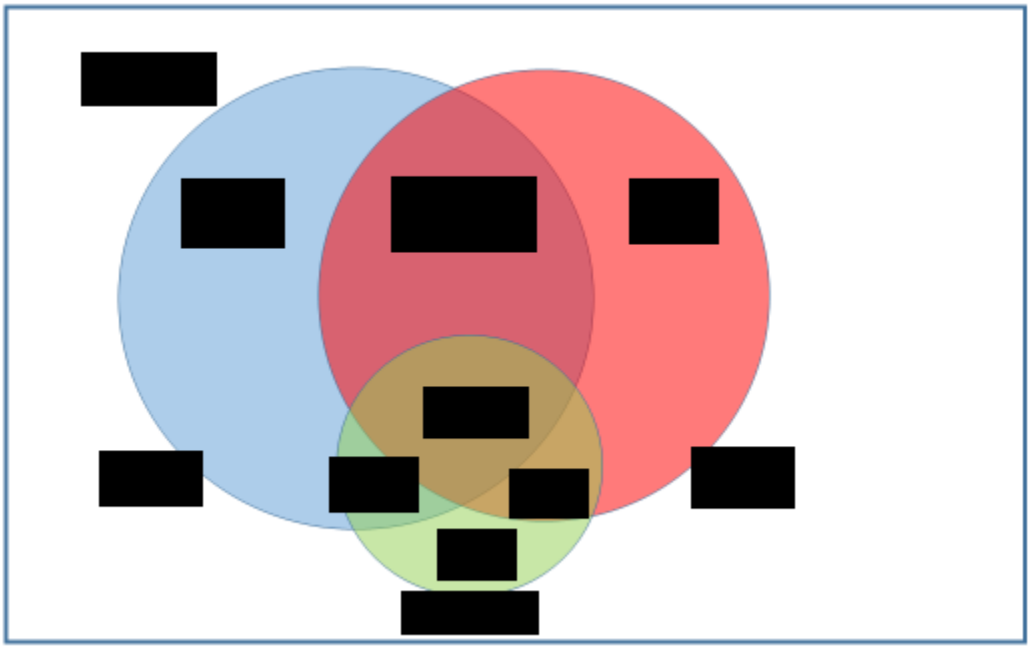
- Presence of competitive access infrastructure in the BT local exchange area.
- Status of the BT exchange area in the future multi-service geographic market analysis and the associated viability for FTTP investment.
- Number of business customers requiring non-mass-market services (currently typified by the requirement of EAD or equivalent).

122. On the first issue of competitive access infrastructure, Figure 1 provides a breakdown of CP LLU presence in the BT only exchanges just looking at three CPs namely TTG, Sky and Vodafone.

[55] Unfortunately, in the original, the blue of the BT+1 is very hard to distinguish from the green of the BT Only.

Figure 1

CP LLU presence in BT Only exchanges



123. It can be seen that whilst in the majority [redacted] ([redacted]%) of BT Only exchanges there is no LLU activity at all; in [redacted] or only [redacted]% of these exchanges there is only one LLU CP whereas for [redacted] exchanges ([redacted]%) there are at least two LLU CPs. Table 1 gives a breakdown of these exchanges in a wider context of the total exchange set.

Table 1

Breakdown of LLU presence by IEX presence

(No of exchanges/ premises covered/ proportion of EAD access circuits)

PCO Presence

	BT Only	BT+1	BT+2
No LLU Principal operator	[redacted] exchanges [redacted]% premises [redacted]% EAD customer ends[56]	[redacted] exchanges [redacted]% premises [redacted]% customer ends	[redacted] exchanges
1 LLU Principal operator	[redacted] exchanges [redacted]% premises [redacted]% EAD customer ends	[redacted] exchanges [redacted]% premises [redacted]% customer ends	[redacted] exchange [redacted]% premises [redacted]% EAD customer ends
2 or more LLU Principal operators	[redacted] exchanges [redacted]% premises [redacted]% EAD customer ends	[redacted] exchanges [redacted]% premises [redacted]% EAD customer ends	[redacted] exchanges [redacted]% premises [redacted]% EAD customer ends

[56] "EAD Customer ends" is a modelled sub-set of Openreach circuit ends which attempts to replicate Ofcom's methodology of excluding circuit ends at Network Nodes.

Note. The data in this Table come from different sources and mostly relates to 2017.

124. The bulk of BT Only exchanges have very few premises and very little in the way of EAD circuits. At the other end of the Table in the densest areas the highest volume of premises and EAD circuits are supplied. As this is based on Openreach's EAD services, the true market view would be even more skewed towards the bottom right of the table as the competitive access infrastructure is predominately in these areas.

125. However there are a significant number of BT Only exchanges with 2 or more LLU operators which serve a sizeable proportion of the population and a fairly high volume of EAD circuits. The targeting of these exchanges using dark fibre is inevitable. Of the 28% of premises in this category, Openreach estimates that two thirds are in areas which Ofcom has classified as 'non-competitive' and only a third are in areas which are which are classified as 'potentially competitive'[57] for future fibre build.

126. The exchanges serving these "non-competitive" areas are coloured orange in Figures 4 and 5 below. This means that even if the difference that dark fibre could make to the cost of backhaul were relevant to investment decisions in access fibre (which Openreach believes is not the case), this would only be relevant to around 9% of UK premises.

127. In summary, the classification of BT local exchanges based solely on competitive presence at the exchange itself is likely to be problematic in reflecting variation in local access conditions. It will also fail to reflect important considerations of other factors including the likelihood of infrastructure build in marginal and remote areas as discussed in more detail below.

(iii) Scenario 1: Any BT Only exchange to any other BT exchange

128. This scenario sets out the scope of Ofcom's remedy as Openreach understands is currently proposed in the Consultation. Under this scenario BT is under an obligation to provide dark fibre from any BT Only exchange to any other BT exchange including to another BT Only exchange. This interprets 'backhaul' as effectively backhaul and core as no definition of 'core segment' is given in the Legal Instruments. Openreach has also pointed out to Ofcom, the 'Backhaul Segment' definition on Page 11 of the Legal Instruments Definitions appears to have no applicability in practice.

129. This scenario has the apparent merit that it places little restriction on the choice a CP may make on either the total number nor the specific selection of BT exchanges they may choose to establish a presence. The CP can establish a presence a set of BT exchanges of their own convenience and then use the dark fibre to connect with as many other BT Only exchanges as they wish. Whilst Ofcom has also not imposed any distance limitations as such, Table 12.3 indicates parity to the EAD 100Mb service which does imply a distance limitation and even though this in fact is not the only active service in backhaul.[58]

130. The scope of this remedy opens up a very wide range of possibilities for CPs which go much further than simply establishing connectivity to outlying exchanges as intended as there is no bandwidth limitation or distance

[57] "Promoting investment and competition in fibre networks – Approach to geographic markets" Ofcom 11 December 2019. This is calculation is based on the postal sector in which the BT exchange is located. 1.1% of premises are in Northern Ireland.

[58] No matter what optical system the CP may choose to light the fibre, there will be some practical reach limitations which will place some constraints on the geographic location of the CP's choice of BT exchanges which they select to establish their presence.

limitation defined in the service and a CP is free to achieve bandwidth and distances as the technology they choose will allow.

131. With normal engineering, backhaul is from the outlying exchange to one or perhaps two parent exchanges, with the second parent exchange for resilience purposes. With the restriction on the physical topology of Openreach's duct network in rural areas, many of these exchanges do not have the possibility of fully diverse routes and so a single route is all that is possible. Therefore, given that there are 4327 BT Only exchanges, this would suggest that somewhere between this number and around 10,000 is the number of backhaul routes that are needed.

132. However, with an assumption that there is no practical distance limitation, this scope of the remedy as defined would make available around 12,000,000 routes and even if a practical distance limitation of 45km is taken, there are still around 584,000 possible routes available. These routes are replicating a core network.

133. Figure 2 below shows these 584,000 potential practical routes from imposing the distance limitation of 45km to the current active EAD service and which in effect 'covers the UK in black'.

Figure 2

Routes of dark fibre based on legal instruments

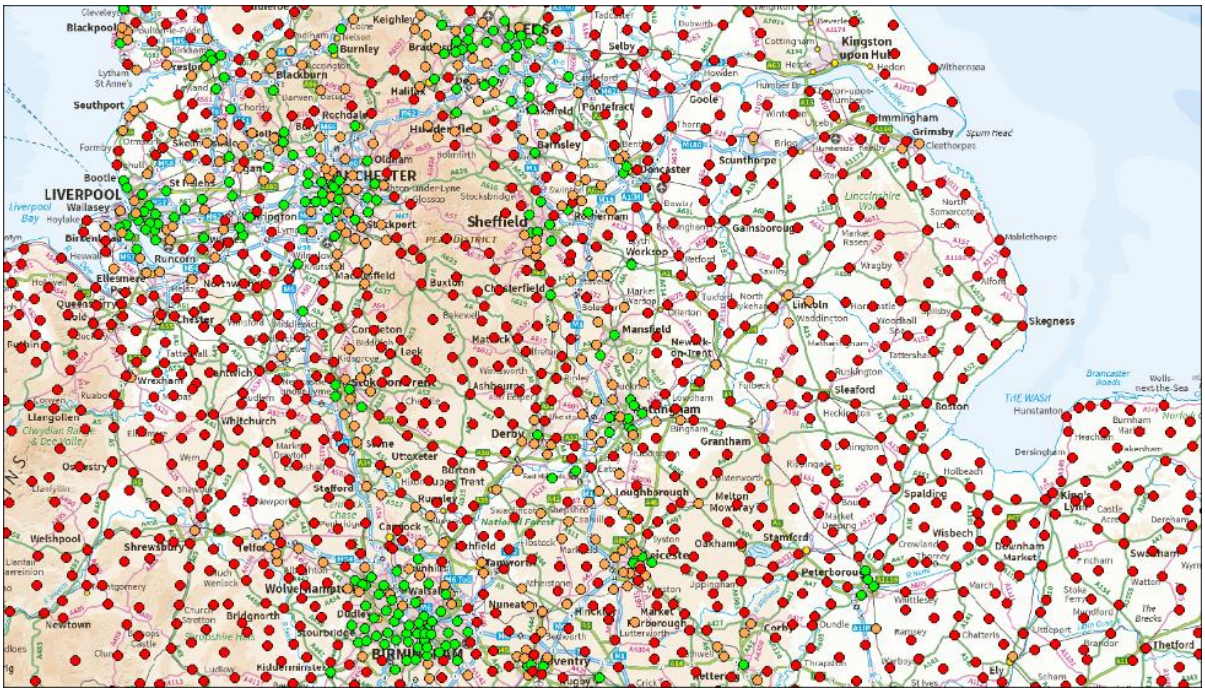
134. Therefore, an implication of the scope of this remedy is that it would be very easy for a CP to construct a national core network.

135. Figure 3 shows the distribution of BT exchanges in the north of England with exchanges marked as BT only (Red), BT+1 (Orange) and BT+≥2 or more (Green). It can be seen that there are numerous possibilities of making a small number of 'hops' between red dots and other exchanges to replicate circuits between the orange

or green dots. [redacted]

Figure 3

BT exchanges in the north of England



136. [redacted]

137. With this scope, it is trivial for a CP to use dark fibre to join up all the major conurbations and cities which is where both BT (Openreach and downstream BT) as well as existing CPs have made substantial investments in core network infrastructure and where no market problem has ever been identified and which the EU Commission has removed from the list of markets susceptible to regulation.

138. Ofcom [12.35] suggests that limiting dark fibre to BT only exchanges poses no risk to rival infrastructure. This is clearly not the case in this Scenario. The ability of rival CPs to build a core network and even backhaul where other CPs have built or might otherwise have decided to build poses a major risk to both returns on existing infrastructure investment and to incentives to invest in new infrastructure.

139. It would seem for Ofcom's overall discussion and the caution they express in limiting dark fibre to only BT Only exchanges, that Ofcom stated aim is to promote infrastructure investment if at all viable. However, if the scope of the remedy as set out in this Scenario is as Ofcom intended, the market reality will be quite different to this stated aim.

140. It is also important to note that the conclusion here would not materially change if the obligation were only to provide dark fibre from a BT only exchange to only a BT+≥2 exchange.

141. A further fundamental issue with the Consultation as it stands, is that it will not encourage access infrastructure build in remote areas and, if anything, deter it. Figure 4 below presents the area around the Wash in Norfolk.

Figure 4

Access and backhaul presence: East of England

142. The diagram is explained as follows.

- In Ofcom's recent consultation they identified no areas where there are two competing network operators in addition to Openreach for all services.
- The background area in orange is the area where it is anticipated that there will be only one viable FTTP operator quite possibly requiring public subsidy and rollout by operators other than Openreach is unlikely. This is circa 30% of premises in the UK.
- The areas in green are where there is the potential for competitive fibre build either from distinct networks or over-build using Openreach duct. This is just over two-thirds of UK premises.

143. BT exchanges are colour-coded:

- The round blue and green coloured dots show where exchanges have external PCO presence for backhaul and these exchanges will also be unbundled.

- The remaining exchanges are where they are BT only with no external PCO and these are split into where there are LLU operators (square purple) or where it is BT only and no LLU unbundling (red triangle).
- The black lines show the parenting of exchanges which are not NGA headends to their parent NGA headend.

144. What the diagram shows is that even the BT exchanges from which Ofcom believes dark fibre backhaul is appropriate (as genuine backhaul) are largely in areas where Ofcom considers there is no prospect of fibre build on a commercial basis.

145. The provision of dark fibre is physically not at all close in any case to the remote access areas where Ofcom wishes to encourage entry for access infrastructure build. Offering cheap backhaul will do nothing to incentivise access infrastructure build in, for example, Cromer or Sheringham.

146. Figure 5 below shows a similar situation for North Wales.

Figure 5

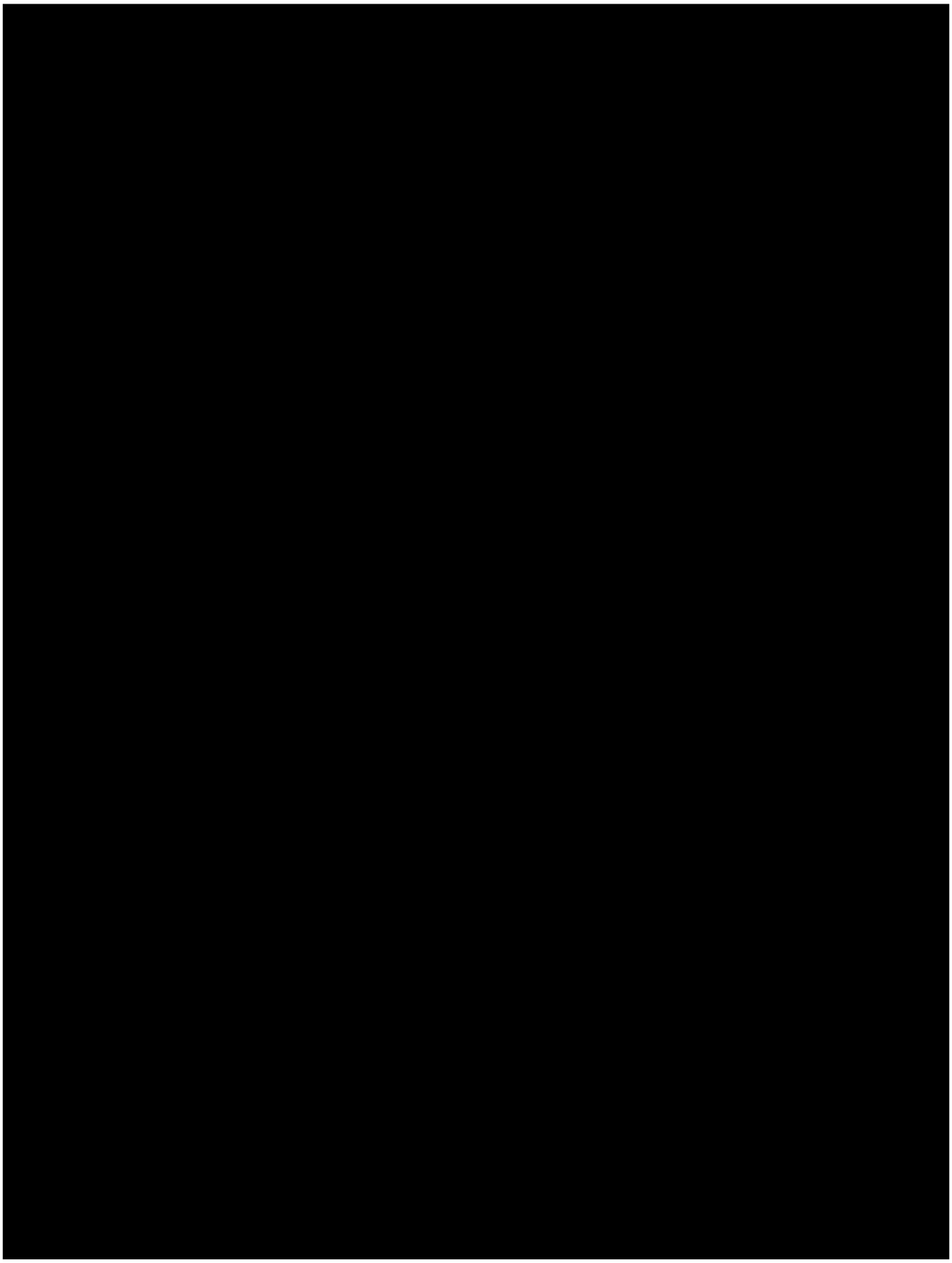
Access and backhaul presence: North Wales

147. Figure 6 below provides an overview of the likely relative costs of build using DPA.[59]

[59] This analysis was undertaken within BT in 2018.

Figure 6

Cost model of CP FTTP build using DPA



148. The plausible areas of marginal access infrastructure are not going to be from remote exchanges as explained above. All that will happen is an arbitrage for copper based broadband from existing BT Only exchanges.

(iv) Scenario 2: dark fibre restricted to an uncompetitive backhaul segment only

149. In this scenario, the scope of the remedy could be restricted to only the backhaul from a BT Only exchange where 'backhaul segment' is explicitly distinct from 'core segment'. This definition would potentially avoid allowing use of regulated dark fibre in a core market where there is no identified market problem and is explicitly excluded from the EU Commission list of market susceptible to regulation.

150. However, this scenario clearly requires some definition of 'core' in order to exclude the core network from the scope of the remedy and the sole classification of the BT local exchanges by competitive presence in this BCMR consultation is of no help in this for the very reasons set out above.

151. Previous attempts to define the BT core network have been problematic in part because the way BT has chosen to structure its network for efficient aggregation and switching are not directly related to competitive presence. However, the issue raised by this dark fibre proposal requires not only BT's core network to be defined, but the core network of each and every other CP. This is necessary as the objective is to ensure that the dark fibre remedy is only used to augment a CP's core network with backhaul to the BT Only exchange with the sole purpose of delivering service to end users located in the exchange area of the BT Only exchange.

152. Openreach notes that Ofcom has made attempts to record the network nodes of principal CPs as part of the calculation of market shares for the assessment of SMP but this information has never been made available to stakeholders. Even if this information were to be available and form the basis of defining a particular CPs core network, this does not define the extent of a more general competitive core or establish the critical boundary between where a CP should either invest in their own infrastructure or can obtain competitive supply. Further, a CP is free to choose the exact location of their core nodes and they are free to choose a location which fits with competitive supply if they so desire.

153. In summary, it is not possible to Openreach to develop this Scenario in any detail without some better indication of a definition of competitive core and establishing such a definition is not an easy task. Moreover, previous definitions of 'core' which have been based on BT's network are not helpful in this regard as they simply relate to circuits between BT nodes alone or to handover to CP nodes.

(v) Scenario 3: focused on NGA handover points

154. When Openreach first developed its NGA FTTC and FTTP products, Openreach consulted extensively on the number and location of handover points for NGA and this resulted in 987 NGA handover points. The 5,573 BT local exchanges are the handover point for the first generation of broadband access based on ADSL and the 987 NGA handover points are the handover points for the second generation of broadband access based on FTTC as well as third generation based on FTTP.

155. This is a considerable reduction on the LLU handover where every BT local exchange is the handover point.[60] This has been stable for many years now and there is every expectation that these handover points will remain so for many years to come. This means that from the perspective of mass market broadband services:

[60] In the Legal Instrument, the definition of 'local access node' is essentially defined by the presence of the MDF which is effectively the LLU handover point.

- The 4,586 BT local exchanges which are not NGA handover points will only ever handover first generation broadband traffic which is expected to decline.
- Conversely, the 987 NGA handover points can be regarded as long-term strategic locations.

156. Given this position, the correct incentive should be for CPs to build to these locations and therefore even where there is no competitive presence at these locations now, this should be encouraged. This is also fully consistent with preferring a DPA remedy where full independent build is not viable rather than dark fibre and the Group Response provides an assessment showing that the economic build using DPA for high bandwidth services can be well over a kilometre for example.

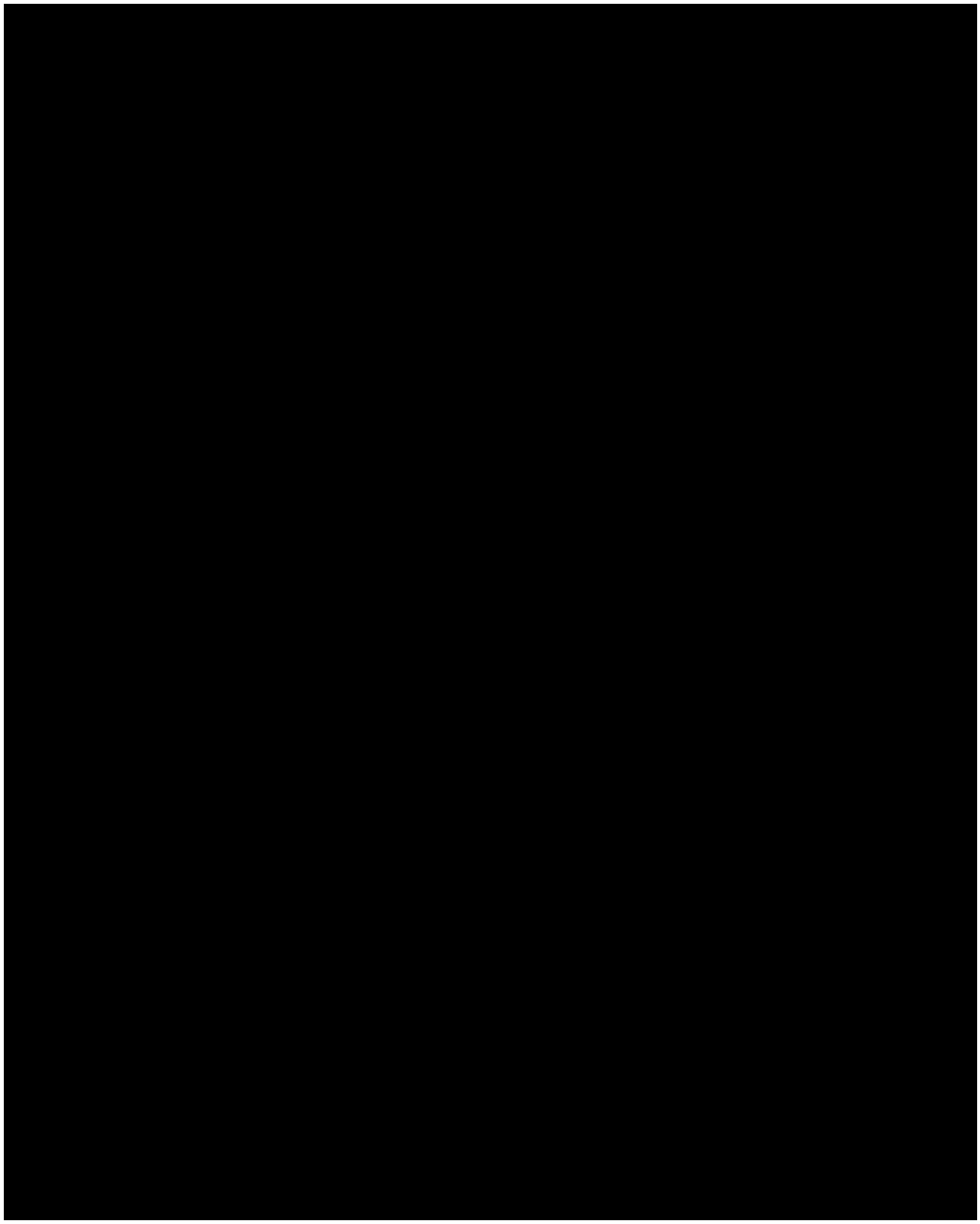
157. This Scenario therefore looks at a scope of the remedy as backhaul from one or the 4,586 non-NGA handover BT local exchanges to a parent NGA handover point. This would mean the scope for the dark fibre remedy would align the legacy first generation broadband with the strategic second and third generation broadband access. In that sense it would be closer to the objective given to NRAs in the Framework Directive Article 8 5. (d) of promoting efficient investment and innovation.

158. This approach would also work for business access as concentration on the NGA handover points is also consistent with the long-term strategic hand-over of active services, noting that business access with dedicated fibre is generally more skewed to the urban areas than is the residential consumer market.

159. This Scenario is illustrated in Figure 7 below. (As in Figure 4 and Figure 5 above, the blue dots represent BT+1 exchanges and the green dots represent exchanges where BT and two or more PCOs are present.)

Figure 7

NGA Handover Points in the UK



160. In summary, in this Scenario interprets the scope of a dark fibre remedy in terms of the long-term strategic objectives of competition as outlined by both DCMS and Ofcom. The scope is simple and clear and the location of the handover for any one BT local exchange is well defined. The distances are generally well within the technology capabilities of opto-electronics that CPs might want to use and also what Openreach can test and maintain.

(vi) Conclusions on interpretation of the scope of a dark fibre

161. It might be possible to define a set of rules to define the scope of the dark fibre remedy. These rules might be able to give proper consideration to the range of constraints including: the desire to prevent inefficient aggregation across single fibres from the price distortions associated with the disparity between the marginal and average costs of fibre; the need to protect core network competition and the infrastructure already sunk by many players; to fit with the long-term strategic direction of investment incentives and permit a degree of flexibility according to the local circumstances and requirements of each CP.

162. Any such rules would have to conform to legal contractual freedoms available to Openreach or permissible under sector regulation and competition law more generally.[61]

163. Whilst it is unclear precisely what competition problem it is that Ofcom is seeking to address with the dark fibre remedy, it is clear that the scope of the proposed dark fibre remedy as we understand it that is currently proposed is misconceived and disproportionate. Further, there is no obvious linkage between the Legal Instrument, the preceding market and SMP analysis at the level of the network that gives an explanation of what backhaul actually is nor to the competition problem that is really being addressed in the first place.

164. We have set out a number of possible scenarios as to what Ofcom's underlying intent of the remedy may have been. However, to varying degrees they might or might not limit the impact on: core network competition; inefficient network structures; and encouraging CPs to promote copper services at the expense of an NGA solution. None of them stand any chance of actually promoting access infrastructure in remote geographic areas. Openreach considers Ofcom's proposals for the dark fibre remedy are mis-placed.

Fossilising reliance of CPs on BT exchanges

165. Openreach has a stated aim to reduce its reliance on so many exchanges and its Next Generation Access Fibre portfolio and Single Fibre Network routes fibre back to 1100 exchanges and new network would route back to even fewer handover points. Openreach is planning an integrated approach across GEA and Ethernet portfolio which will not align with keeping the current arrangements in place.

166. Ofcom's proposed inter-exchange dark fibre price will encourage greater reliance on the Openreach traditional PSTN exchange estate which will hinder future exchange rationalisation. This may also drive Openreach to need to consider increasing its Local Access pricing and decreasing its Standard circuit pricing within the bounds of the CPI-CPI charge control and the sub cap of CPI+5%.

[61] See the Openreach response of 29 December 2017, paragraphs 289-294 on this matter.

Annex C:

Comments on Ofcom's implementation timescales for the proposed dark fibre remedy

Summary

1. Ofcom incorrectly assumes that one month after publication of the Final BCMR Statement is a sufficient timeframe for Openreach to both launch the proposed new dark fibre remedy and agree the Reference Offer with industry. This means that if Ofcom were to publish their Final BCMR Statement on 30 April 2019, Openreach would be required to deliver a fully functional dark fibre product by 30 May 2019.

2. This approach is unrealistic and overlooks a number of key activities that would need to be undertaken both in terms of restarting the process to physically deliver a working product, redesigning the remedy to meet the new requirements, training the necessary resources and simultaneously negotiating the contractual terms for the product and agreeing SLAs/SLGs with industry.

3. In addition to the above, in order to physically launch the dark fibre product, the design would need to be allocated into a systems development release. Our systems development release cycle (there are generally at most two releases per quarter) does not have infinite capacity, and the allocation of developments to each release is agreed with industry several months in advance.

4. However, should Openreach be obliged to deliver the proposed dark fibre remedy, then we propose that the approach set out in this annex, based on a phased approach across two separate development releases, should be followed. This would i) enable Openreach to reduce the execution risk in the systems stack that would arise from requiring a range of developments such as DPA including uDPA (a regulatory requirement) and FTTP to be delivered simultaneously and ii) allow a period of operational testing and a soft trial of the new dark fibre product with industry prior to full launch in October 2019.

5. Assuming Ofcom publish the Final BCMR Statement in April 2019, we propose a five-month timeline following publication to full product launch. This is set out below:

May 2019	• Finalise design requirements • Begin industry negotiations on the Reference Offer
July 2019: Release 4100	• Deliver dark fibre order journey • Begin internal Model Office testing
August 2019	• Soft Launch/Trial dark fibre with industry from mid-August • Trial to be available in agreed geographies with limited volumes • Begin the Product Establishment process with CPs
September 2019 : Release 4150	• Final Reference Offer published • Deliver developments not required at soft launch such as migrations, cease charge etc.
October 2019	• Launch dark fibre

6. If the Final Statement was published after April 2019, the delay would feed through into these timescales.

Dark Fibre Remedy: New product specification

7. A number of implementation issues would need to be addressed to implement the proposed remedy.

Topic	Comments/key observations
Order journey	All order journeys designed for dark fibre would need to be reviewed and re-tested on EMP. Logic could be re-used for new capabilities **(SD)** Assume EAD would be the anchor product for the new DFx remedy, as per previously for the 2016 BCMR dark fibre remedy – this is a key point for systems design
Migrations	Migration scenarios require modification in line with exchange only termination – available for existing routes only **(SD)**
Geography	The new geographic limitations, would require new order validation capabilities to validate and reject orders that are out of scope. **(SD)**
Termination Options	Would require modification in line with new requirement for termination options at BT exchanges only **(SD)**
Route maps	CPs would be able to view cable lengths in order to calculate their 'fibre tax' and request RO2 manual resilient maps as per EAD. **(SD)** *The physical (visual) data for route maps will not be available as this capability was never launched after unsuccessful testing for dark fibre*
Cease	30 day lead time would remain as per the dark fibre product specification with a truck roll required to physically break the fibre. **(NC)** Raising and billing of associated cease charges. **(SD)**
Product name	Working name assumption is now Dark Fibre X (DFx) rather than DFA **(SD)**
Assurance	SLAs would remain the same, SLGs will need to be reviewed, discussed with industry and may change from 2016 position. **(SD)**
Distance limits	There is a technical limit in how far we could reliably OTDR test a fibre so our proposal is to maintain existing distance limitations of 46km (86km with EAD extended reach) for the new DFx product
ECCs/TRCs	Where it is determined, following a capacity check at an exchange, that new build is required, we reserve the right to reject the order where such a request is not reasonable. TRCs to apply as per EAD **(NC)**
Repair	18 hour repair SLA as per the original product specification. **(NC)**
Topologies	The new product would support single or dual fibre working and have an RO2 variant as per the original product specification. **(NC)**
Sales tools	Need to review with industry, unlikely some aspects such as Standalone Survey are now required **(NC)**
Contract/ Reference Offer	Standalone contract with a 12 month minimum term as per the Reference Offer for DFA. Need to re-negotiate the T&Cs in line with new requirements
CP obligations	Forecasting regime will need to be reviewed in line with other industry discussion on the Reference Offer negotiation. RWT charge to apply above 6% [£TBD], CPs liable for non-domestic rates.

Key
SD = Requires Systems Development
NC = No change

Dark Fibre Reference Offer and Operational Readiness

8. In addition to the completing the significant activity outlined above required to enable systems readiness for product launch, Openreach would need to simultaneously:

   a. negotiate and agree a new Reference Offer with industry;

   b. implement a national training programme for Openreach desk and field teams; and

   c. establish customers for the product.

9. A high level overview of the tasks and activities involved are set out in the table below.

Contractual	Product Collateral	Operations
Will be required to re-negotiate • Terms and conditions (minor) • Schedule 1 Definitions (amend for new requirement) • Schedule 2 The Service - **S** • Schedule 3 Forecasting (minor) • Schedule 4 SLA/SLG - **S** • Schedule 5 Migration - **S** • Review periods will also need to be revisited ***S** = likely to require significant re-negotiation*	Following on from the contractual negotiations there will also be revisions required to product documentation (which then form part of the contract) including: • Product description • SIN • Billing Manual • Forecasting Manual	Implementation of a dark fibre product will require significant training for Openreach desk and field teams all over the country: • Planning teams will need to be upskilled to Process orders • Field teams will need to be upskilled to install and test and repair Dark Fibre circuits, working with passive fibre is fundamentally different to how our field teams work today *Note: - This will be a major training programme, being rolled out at the same time as the new PIA requirements.*
CP Establishment for the dark fibre product On average, it takes 90 days to establish a customer and; • Complete all financial contractual pre-checks • On-board the CP to EMP for systems readiness – note, this requires a CP to implement changes within their own systems stack • Sign the final contract when the Reference Offer is agreed		

10. Openreach has major concerns regarding the proposed one-month negotiation window for agreeing the new dark fibre Reference Offer. Past experience with the dark fibre access negotiations in 2015/16 showed that these can be lengthy and protracted. CPs themselves will want to time to consider and understand the new proposals. It is in no-one's interest that Openreach launch a product at speed without the opportunity to discuss with industry and to give due consideration to any comments or concerns that they raise. Such an approach risks unnecessary disputes which could be avoided if due opportunity is given to negotiations. As set out above, Openreach consider that a reasonable time period in which to conclude industry negotiations on the Reference Offer is a period of four months after publication of the Final Statement.

11. Allowing a phased implementation process would provide the Openreach Operational teams with sufficient time to plan the necessary training to support a national roll out for the dark fibre remedy. In addition, this would

also enable Openreach to properly engage in industry dialogue and allow our customers to on-board via the Product Establishment process and be ready to consume the new product from launch.

Parity for dark fibre with active Openreach products: Ethernet Access Direct (EAD)

12. Openreach has queried with Ofcom the intended anchor product for the new dark fibre remedy. In the 2016 BCMR Final Statement, it was clear and unambiguous that the mandated 2016 dark fibre access product should be offered on the same process and terms as the EAD 1G product. However in the 2019 BCMR Consultation Ofcom's intentions are unclear. This is a key issue for Openreach not only in order to be able to understand our regulatory obligations, but also to ensure that the requirements are reflected into the necessary systems design. This matter was raised directly with Ofcom at a meeting between Openreach and Ofcom on 11 December 2018. Ofcom subsequently replied via email on the 18th December 2018 that it "made practical sense for DFx (DF for IEC) to be linked to EAD".[62] We believe Ofcom should confirm this point in the BCMR Final Statement.

13. The order journey that was designed for the mandated dark fibre access product in 2016 is not aligned with the current EAD order journey, as a significant number of systems and processes enhancements have been implemented in the intervening 18 month period. These include enhancements such as KCI management, date and delay, all of which would need to be designed, built and implemented for the new dark fibre order journey.

14. It is not possible to design and deliver these enhancements in the timescales outlined above for the proposed dark fibre remedy. Openreach therefore proposes that it should conduct a separate feasibility study regarding these additional requirements and discuss and agree priorities with industry at a later date.

15. We outline at paragraph 5 that assuming the Final Statement is published by April 2019, a full launch would only be possible in October 2019. Ofcom should note, there is still likely to be a parity gap at this stage if the anchor product is EAD. We would propose this is considered alongside the outcomes of the re-imagining Ethernet (REP) consultation. We also propose that during development we review the requirement for some of the EAD functionality. For example, View My Job and B2B services may not be required due to the revised scope of the product and anticipated volumes.

Guidance on what would constitute a reasonable request for dark fibre

16. Ofcom has indicated that it considers arrangements concerning the provision of new infrastructure should be the same as those relating to active services.[63] Openreach considers the limits of a regulatory network access obligation, in particular what constitutes a "reasonable request", should align to the principles Ofcom set out in its 2018 Wholesale Local Access Final Statement in relation to the PIA remedy. We make a number of points below.

    a. A dark fibre access remedy should be not broadly interpreted, but should be being limited to access to already existing duct and fibre. This would be:

        i. consistent with the approach undertaken by Ofcom in the WLA 2018 Final Statement with reference to the PIA remedy, where network extension has been explicitly excluded by Ofcom from the scope of any access obligation, as well as with Ofcom strategy Paper on supporting

62 Email from Mathew Thomas Ofcom to Katherine Roche Openreach Regulatory Affairs at 11.21 on 18 December 2018

63 Consultation paragraph 12.107.

investment in full-fibre broadband, which advocates an holistic approach between the WLA and BCMR market;

ii. in line with general competition law provisions, which do not compel dominant undertakings to build new infrastructures or expand the capacity of existing ones to allow market entry or growth of new players; and

iii. proportionate considering the benefits and risks attached to dark fibre as outlined by Ofcom in the Consultation, in particular because a broad interpretation of the access remedy would likely have a not insignificant impact on other operators' incentives to invest (contrary to Ofcom's assumptions) and might also likely result non-feasible and/or non-commercially viable for Openreach, possibly leading to under-recovery of costs in some circumstances.

b. "Reasonable request" should be interpreted along the lines of the criteria which have been used by Ofcom in establishing whether a network adjustment falls within the scope of the PIA obligation, namely if it is necessary, feasible and if improves efficiency. We outline a number of key scenarios in this regard in Annex B of this response.

Scenario	**Obligation on Openreach to provide dark fibre**
There is no direct duct between two BT exchanges, i.e. the request is for access to dark fibre outside Openreach existing footprint;	Subject to Openreach's comments about narrowing the application of the dark fibre remedy above to specific routes, Openreach should be required to consider whether there are alternative routes via other exchanges. There should be no obligation on Openreach to build new duct and fibre as this would require Openreach to extend its network.
There is duct between two BT exchanges with capacity but there is no fibre;	Where there is no fibre network between BT exchanges, no dark fibre network access obligation should apply since no fibre network exists. CPs can deploy their own fibre networks using the DPA remedy.
There is duct with capacity but fibre is fully used (i.e. there is no spare fibre);	CPs can deploy their own fibre networks using the DPA remedy and so it would not be reasonable to require Openreach to deploy additional fibre instead.
There is fibre with spare capacity.	A dark fibre network access obligation would apply.

Distance Limitation

17. Openreach has also raised concerns regarding the proposal that as the new dark fibre remedy is no longer restricted to lower bandwidths, then Ofcom see no reason to propose any distance limits.[64] In doing so, Ofcom has overlooked the historical 45km 'main link' (exchange to exchange) radial distance limitation in use today for the Openreach active portfolio, upon which all current operational planning processes are based. The current limitation is based on proven engineering principles, with 45km deemed to be the optimum reach of a circuit before amplification is required via an extended reach product of up to 86km.

64 Consultation, footnote 349

18. There is also a technical (and safety) issue limit in how far Openreach could reliably conduct an Optical Time Domain Reflectometer (ODTR) test on a fibre. Both of these issues were also raised with Ofcom at the 11 December 2018 meeting between Openreach and Ofcom referred to above. Openreach set out its intention to adhere to these engineering and safety principles for any proposed dark fibre product, and we were subsequently invited to make these comments in our response. We would welcome Ofcom's support on these proposals.

Annex D:
Comments on Ofcom's CI Access product market definition

Contents

I. SUMMARY

1. Openreach disagrees that there is a single product market at all bandwidths. This was rejected by the CAT and we were expecting that Ofcom would have taken on board the recommendations of the Judgment.

2. The analysis Ofcom has followed is flawed as it should focus on the demand side in assessing the SSNIP test and not include existing fibres in the supply side factors which Ofcom have emphasised. This is a departure from the approach used in previous Ofcom consultations and has not been explained. If Ofcom had followed the established methodology we believe that the evidence would not support a single product market and the following are the key points we make in this regard:

   - Ofcom positions the demand side analyses using Critical Sales Loss calculations as ambiguous, but we believe they show that there is a break from 1G to 10G/VHB services,[65] and potentially between 100M and 1G.

[65] Ofcom's assertion that the results are ambiguous as BT's VHB prices are 'high' is itself not well founded. This argument was never made by Ofcom in the Appeal and nor does the Judgement suggest that the price comparisons made between BT's

- Ofcom fails to examine whether there are groups of products within the supposed chain which are worth monopolising and to establish this is a necessary condition that none exist for a chain to be possible. It is not sufficient to test that each link in the chain is constraining in both directions, as this is a necessary but not sufficient condition.
- The possibility of combining a series of 'sub-markets' such as 100M and 1G into one overall chain of substitution is not sufficiently evidenced, and Ofcom's own assessments indicate this would be implausible, especially under a true Modified Greenfield Approach (MGA).
- Ofcom's primary source of competitive constraint is now supply-side substitution but this is an erroneous misunderstanding of the role of supply-side potential entry in the delineation of market boundary analyses. The customers who have multiple suppliers at any one site cannot acquire additional entry from a SSNIP as there is no additional supply-side entry which can be envisaged in any case.[66]
- Where customers are not served by multiple operators - and which will be the vast majority - Ofcom provides no evidence that a SSNIP will induce infrastructure expansion. Indeed, the analysis suggests that willingness to dig will be strongly influenced by the value of the site itself and result in a bandwidth break. Conversely, Ofcom relies on the risks of sunk costs to attribute Openreach with market power from its ubiquitous network but this is the same manifestation of supply-side limitations.
- The other factors cited for a chain such as competitive conditions either do not support Ofcom's hypothesis of a single product market or are tangential and not evidenced, such as customer inconvenience of acquiring new supply limiting dig distance variations by bandwidth.

3. If supply-side conditions dominated the assessment of a single product market in such a simple and straightforward way, it would be likely that Ofcom would have used this approach previously.[67]

4. On a related issue, Openreach considers VHB to be a separate product market, where we are likely to not have SMP. Ofcom has only actually analysed Access and of its own admission has not looked at service share for the inter-exchange (IEX) market. For IEX Ofcom explicitly deregulates Openreach where there is PCO presence at BT+2 exchanges as not having SMP, which is not consistent with the analysis for the Access market (which until now has been analysed consistently by virtue of being a single market until now). Openreach considers that for large parts of the UK it does not have SMP in Access for VHB. Further concerns on the IEX market have been covered in Annex A.

5. We consider that there are additional errors of principle and application in Ofcom's economic analyses for the product market:
   - Ofcom fails to apply MGA properly both in the wider context of DPA which will affect the market within the review period.

services were tainted by the prior exercise of market power. In the Appeal the CPs did make this argument see Transcripts [15, 1582] but this did not appear to impact the conclusions of the CAT. BT's Counsel also pointed out the presumption of prices being competitive unless evidence shows the contrary Transcripts [16, 1687].

66 The 2018 Commission Guidelines paragraph 41 explicitly states that 'NRAs may also take into account the likelihood that undertakings *not currently active on the relevant product market* may decide to enter the market. (emphasis added). By definition in this instance the undertakings *are* active on the relevant product market.

67 In the DoE Report of some 250 pages, the role of supply-side substitution is a mere two sides [46-47] and given no prominence whatsoever. The entirety of Section F ('Product Market Definition') of the Judgement is demand-side focused.

- By basing the definition of leased lines around a very specific regulatory remedy (EAD) Ofcom does not start with the retail market and so is not in conformity with what the industry understands as a leased line, and is biasing the analysis on bandwidth breaks.
- The analysis does not properly account for downstream-upstream linkages which would show that site value and the bandwidth gradient are intrinsic elements of both wholesale and retail markets. In fact, Ofcom explicitly accepts the bandwidth gradient as being intrinsic in this market.[68]
- Ofcom claims to take into account indirect constraints[69] but we do not agree with this analysis, and believe this has been excluded in analysis of the new 'Inter-exchange market' (IEX).
- EFM services have wrongly been excluded. Although the total system size of EFM is likely falling, there are still new connections suggesting that this service continues to provide a constraint for the 10M EAD service.

II. COMMENTS ON OFCOM's APPROACH

SSNIP test as the conceptual framework

6. We concur with Ofcom's outline framework.[70]

7. In the Appeal, the Experts agreed on all but one of general conceptual issues which was the issue as to whether the monopolist in the HMT was also present in supplying only the focal product.[71] Here the DoE JER [10] argued that:

   'The Hypothetical Monopolist should be assumed to produce only the focal product. Assuming that the hypothetical monopolist supplies other products would risk not identifying relevant constraints on the service in question'.

8. We note that now Ofcom appears to assume that Openreach is acting as a quasi-monopolist[72] and couches the question as one of presence in the provision of products other than the focal product itself. This does not appear to be compatible with the position of the DoE in the Appeal as cited above.

9. Ofcom quotes Openreach internal documents suggesting that this behaviour is part of a planned profit-maximising portfolio of services.[73] While BT operates responsibly, we have a fiduciary duty to satisfy shareholder returns and so will of course consider profit maximisation (subject to any regulatory constraints) as would any competing provider. Further, discussion of relative prices in an internal pricing paper is not compelling evidence of a chain of substitution, which was a view also rejected by the CAT in the Judgment.[74]

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68 A7.10 footnote28 BCMR 2019 Consultation

69 4.17 BCMR 2019 consultation

70 4.7-4.10 BCMR 2019 Consultation

71 JER [1-10]. Issue 10 relates to whether the Hypothetical Monopolist makes assumptions about products beyond the focal product.

72 4.22 BCMR 2019 Consultation

73 Footnote 55 BCMR 2019 Consultation

74 Judgment para 222: 'Accordingly, we do not consider that the internal BT documents provide any support, still less that they provide any "compelling evidence", that the 1G Ethernet service was generally substitutable for the 10G service; nor do they support a conclusion that the price of BT's EAD 1G service provided any competitive constraint upon the price of its new EAD 10G service.'

10. Ofcom[75] accepts that the HMT procedure is to find the smallest possible group of products profitable to monopolise.[76] This was accepted by the Experts in the Appeal,[77] and the Judgement also made this clear.[78]

Modified Greenfield Approach (MGA)

Issue 1: Definition of a leased line

11. Ofcom's generic descriptions of networks in Section 3 are reasonable in our view, however we would note that Figure 3.7 which purports to show what a 'typical' leased line looks like is inconsistent and can mislead.

12. The industry understanding of a leased line is a path ('bitpipe') which crosses the network as a whole.[79] This is explained reasonably accurately by Ofcom.[80] However, this definition is inconsistent and not compatible with the classification of 'leased lines' in [3.25-3.41]. This especially relevant in Figure 3.7 which is entitled "Structure of a typical leased line" but which has no correspondence with the 'leased lines' described in [3.19] and Figure 3.3.

13. The definition of a leased line and the relationship to packet switching technology has been the source of some disagreement in the past two market reviews and while the general descriptions from [3.17] to [3.24] are in our view a considerable improvement from those in previous market reviews, the subsequent descriptions in [3.25- to 3.41] are still inconsistent, where the EAD service is presumed to be a leased line. This is flawed under a MGA approach as it does not start with the retail market and work upstream, but starts with a product that exists as a result of prior regulation. Importantly, in this subsequent section no attempt is made to decouple what is typically offered commercially from what is offered under obligation of regulation, and this distinction is an essential requirement of the MGA. It is not legitimate under MGA to treat a product as a focal product if its existence and essential characteristics exist solely as a result of regulation.

14. This becomes especially important as remedies are pushed further upstream and from products that would be offered in a normal competitive commercial marketplace. There are many characteristics of Openreach's active portfolio, which are a direct result of regulation and absent this specific regulation Openreach would likely prefer to offer different technical and/or commercial solutions.

15. This means that when Ofcom carries out a market analysis of such products, Ofcom is effectively analysing the characteristics of its own regulation which is counter to the requirement to take an MGA for the market analysis. To the best of our knowledge the EAD service is unusual and not typical of the equivalent remedy in

75 Footnote 50 BCMR 2019 Consultation

76 The definitive analysis in the multi-product case is contained in Dobbs I, Int. J. of the Economics of Business, Vol. 13, No. 1, February 2006, pp. 83–109, 'Defining Markets for Ex Ante Regulation using the Hypothetical Monopoly Test'.

77 DoE JER para 7: 'Agree. This is consistent with the description of the test in the relevant Guidelines. The SSNIP test considers whether a hypothetical monopolist could profitably impose a small but significant non-transitory increase in price (a SSNIP) in a candidate market. If demand-side substitution to, or supply-side substitution from, alternative services is sufficient to render the price increase unprofitable, then the market should be widened to include the closest substitute services. (Curry 1 §§23).'

78 Judgement para 330 and 336: '336. It therefore appears to us that Ofcom could not safely reach the view that there is a single market spanning the CISBO spectrum without considering constraints do exist across the chain or whether sub-groups within the overall chain themselves form relevant markets, disrupting such transmission.'

79 See the first Witness Statement of Mr Reid (Reid 1) and the Technical Primer in the 2016 Appeal.

80 3.19 and Figure 3.3, BCMR 2019 Consultation

other countries where an aggregation service is more common and which will have a higher proportion of bandwidth-related costs.[81]

16. Importantly, the bandwidth gradient or any other contractual way of achieving differential recovery of common costs is unquestionably a key feature of free market solutions in this industry allowing a means of recovering high common costs. This is especially important as Ofcom's cost benchmark is based on fully allocated costs (FAC) which does not reflect how common costs *would* be recovered in a competitive marketplace. It is Ofcom's own regulation in this context that has pre-determined the allocation of common costs.

17. The second aspect of concern here is that because Ofcom has mandated this particular form of upstream remedy, it is inevitably more likely to find no bandwidth break in the true product market. The more that aggregation takes place, the greater the bandwidth costs will form as part of the overall cost of provision and particularly if common costs are allocated according to willingness to pay as proxied by bandwidth.

Issue 2: The implications of DPA

18. Openreach has had the benefit of reading the BT Group response on this matter and the report that BT Group commissioned from Alex Partners. Openreach agrees with and endorses the comments set out in those documents.

Relationship between wholesale and retail markets

19. We agree with Ofcom that it is not formally necessary to define retail markets. However this has been undertaken previously[82] and does have merit as it addresses linkages and issues between wholesale and retail markets and can directly address issues such as bandwidth breaks.

20. Specifically, combining MNO and LLU backhaul operators with wholesale and retail access services treats all sectors as a composite. However, this may impact a proper assessment of switching costs on the demand side including the need to upgrade core network capacity consequent on a possible increase in capacity of access circuits following migration up to a higher bandwidth circuit consequent on an *unanticipated* SSNIP. In this Consultation there is no consideration of equivalent switching/upgrade costs for either wholesale or retail customers as Ofcom asserts there is a single market from supply-side considerations alone, and the reason for excluding this analysis is not explained.

III. DEMAND-SIDE SUBSTITUTION

Market description

21. As a general observation we believe that the Cartesian Report provides a reasonable description of the sector purely from a business customer perspective. What it does not bring out however is that there is a huge range in customers and associated site value from EFM to optical high value solutions. This indicates perhaps a factor of 1,000 from the lowest price to the highest price. This compares to a maximum range of perhaps three in consumer broadband from a cheap copper service up to FTTP. It would be very surprising if a hypothetical

[81] See for example the technical specification of the equivalent service offered in Ireland by the incumbent available at the following link - https://www.openeir.ie/Products/Data/Next_Generation_Ethernet/

[82] 2008 and 2013 BCMRs. There was no clarity in the 2016 BCMR for stakeholders whether or not Ofcom maintained its position on the relationship between retail and wholesale markets in the prior market review.

monopolist could not make a profit for some grouping of business sites within this very wide range of extremes in site value

22. We note that Ofcom once more references the 2016 BDRC survey[83] which provides little useful insight into whether or not there is a bandwidth break.[84] For example, businesses were asked questions with options which were incompatible with the notion of a monopoly, such as being able to re-negotiate prices following a SSNIP.[85] Ofcom has continued to refer to this and not undertaken any new research on the possible reaction of either wholesale or retail customers to a SSNIP on upstream regulated services. Given the new (improved) presentation of the market it is important to note that this survey only interviewed business customers (those on the extreme right hand-side of Figure 3 of the Cartesian Report) and they are not the direct customers of any of the focal products.

23. In giving a reasonable picture of the industry from the perspective of business customers, the Cartesian report clearly places all network operators including MNOs and fixed broadband operators such as Sky, TTG, and downstream BT as "Network Operators" (on the extreme left-hand side of Figure 3 in the Cartesian Report) and "end users" are the "businesses" (on the of extreme right-hand side of Figure 3 of the Cartesian Report). The supply of mobile backhaul and LLU/NGA backhaul is supply internal to the network operator industry (mobile backhaul being shown in more detail in section 8 of the Cartesian report). Openreach welcomes this clarification.

24. This is relevant to the understanding of demand side switching as the context is a set of focal products which are elements in the wider network of these operators and they will make their switching decision in conjunction with the impact of this decision on the rest of their network. In particular, this framework makes clear that the only way these operators can extract value from any extra bandwidth on a particular business access or backhaul link is if they are able to exploit the bandwidth for services to *their* customers. As service to their customers requires much more than the business access or backhaul link, exploiting the extra bandwidth would invariably require equivalent extra capacity on all these other elements of their network in order for these operators to extract any value. Given these costs are likely to greatly outweigh the business access or backhaul costs, it seems highly implausible that any network operator would pay extra for higher bandwidth business access in excess of the demand from the rest of their network as without substantial further investment, the bandwidth will just sit idle.[86]

25. As a result, Openreach disagrees that "Consequently, a 10% price rise could sometimes mean that customers would save costs and get the benefit of a substantial bandwidth boost, by switching to a higher bandwidth".[87]

General approach and the issue of competitive prices

26. We agree with Ofcom that the HMT and SSNIP tests are predicated on prices being observed at the competitive levels.[88] With regard to 10G prices, we disagree with Ofcom's assertion[89] that a price above FAC is indicative

83 Footnore 86 BCMR 2019 consultation

84 Judgement [217] and [292].

85 Judgement [240-241].

86 This is in contrast to the planned augmentation of capacity absent any suggestion of a SSNIP response.

87 4.30 BCMR 2019 consultation

88 Also see Ofcom's 2013 Statement paragraph A3.26. Note that the Commission in its Guidance states that observed prices should be assumed to be competitive unless there is convincing evidence to the contrary.

89 4.23 BCMR 2019 consultation

of market power. The Openreach price is informed by the marketplace and competition, and a price above FAC is consistent with the product lifecycle dynamic that Ofcom discusses in the consultation[90] and also acknowledged in the 2016 BCMR.[91]

27. Specifically, we do not accept that a FAC based on allocation of fibre strands in duct is likely to yield a sensible benchmark. It was accepted by all parties in the Appeal that the sector is characterised by low incremental costs.[92] The marketplace will inevitably gravitate toward a system of pricing which will deviate from a FAC benchmark. For very many years it has been implicit and often explicit in Ofcom's regulation of BT's pricing with baskets of services that commercial freedoms to reflect willingness to pay are a positive feature.

28. Ofcom cites the cellophane fallacy in this context.[93] The premise is that a monopolist may have set a price above the competitive level to a monopoly level reflecting full market power and that this has brought in competitors which induce switching and so falsely broaden the market. Were the monopolist pricing at the competitive level, these other products would not such be attractive alternatives as they would be too expensive and so a much narrower product market. In this case, Ofcom asserts the opposite:[94] if the 10G price was lower, this would induce *more* switching such as from a SSNIP at 1G and bring more products into the market and broaden it. This however is not the cellophane fallacy.

29. In summary, the assertion[95] that 'BT would have market power on VHB services on a standalone basis, so prices on these services may be distorted' is rejected and is discussed further in Annex F.

The SSNIP analysis in Annex 8

30. We note that Ofcom is now largely if not exclusively relying on calculations of Critical Sales Losses (CSL) from a SSNIP as part of the demand-side assessment of the HMT. This approach of undertaking specific economic quantification is a departure from Ofcom's approach and views previously (2016 Appeal) and it would be helpful for stakeholders to understand the reasons for this apparent change of view.

31. Our conclusions on Ofcom's analyses as presented in Annex 8 can be summarised as follows:

- 10Mb. A8.27. It is evident that with a SSNIP that 10M is constrained by 100M and not an economic market in its own right.
- 100Mb. A8.34. Based on a number of Openreach documents[96] Ofcom asserts that when Openreach has implemented some rental reductions in 2018 on 1G, putting up the price of 100M by 10% might

90 A7.7 and A14.15 BCMR 2019 Consultation

91 4.153 BCMR 2016 Final Statement: 'As we noted above, the difference between the price of BT's new 10Gbit/s service and its 1Gbit/s Ethernet price is now very similar to the bandwidth gradient observed lower down the chain. In the 2013 BCMR Statement, we included 100Mbit/s and 1Gbit/s Ethernet services in the same (AISBO) market, and these services had a similar price differential. [·] has told us that, as a rule of thumb, the price of CISBO services increases as a square root of the increase in bandwidth and noted that the price gap between 1Gbit/s and 10Gbit/s services was consistent with this rule, which also applied in other parts of the bandwidth chain. We note that the application of rules of thumb like the square root rule across the entire bandwidth chain would tend to result in pricing interdependence.'

92 Transcripts 15, 1532

93 4.24 BCMR 2019 consultation

94 4.32 CBRM 2019 consultation

95 4.23 BCMR 2019 consultation

96 Footnotes 51-54 BCMR 2019 consultation

induce 20% migration up to make it unprofitable. So 100M is constrained by 1G and it is not a market in its own right as a focal product.[97]

- 1G A8.66. The differential with 10G is very wide at current prices so it is only likely to have migration up to 10G if there are more than x2 1G circuits on the same route [A8.68]. CPs will not migrate down to 100M with loss of bandwidth and value so here the switching between these bandwidths is asymmetric.
- 10G A8.77. CPs will not likely go down to 1G especially if bandwidth demand is growing so 10G, which indicates it is in its own market when it is the focal product (although Ofcom does not state explicitly this).

32. Subject to a number of caveats, we would not disagree with most of these findings but the conclusions that Ofcom draws [4.37] are not all accepted. The extent to which a SSNIP on 100M would induce a shift up to 1G is arguably not as high as Ofcom suggests. There are a lot of implicit assumptions about the benefits of early migration in business access which is generally quite different from the consumer-focused downstream markets where the backhaul sectors are simply upstream inputs as discussed above.

(i) 1G

33. Ofcom does not appear to explicitly say that if 1G is the focal product, then it is a market in its own right as there are no incentives to trade down and very weak incentives to trade up. For business access 1G has a much stronger link with 100M than with 10G where volumes are very low.

(ii) 10G

34. The evidence is not ambiguous as to whether there is a break between 1G and 10G in Annex 8. We believe there is clear evidence that there is a break. If the results were ambiguous there would be outcomes which might indicate the opposite conclusion but in fact Ofcom does not advance any such scenarios. Ofcom does not show that if VHB and 10G in particular were set at a FAC level the results would be any different.

35. Further, in looking at the potential for upward migration from 1G to 10G, Ofcom does not recognise the October 2018 price reduction in 1G which was cited by Ofcom as linking 100M with 1G. Hence the differential between 1G and 10G would widen even if 10G was currently priced above the competitive level which Ofcom postulates but does not demonstrate.[98]

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97 The Judgement [334] explicitly states that each bandwidth needs to be assessed as a focal product.

98 In considering a SSNIP at 10G, we note that the CAT made the following comments in the Judgement:

'303. Importantly, at no point in the proceedings was there any discussion of the diversion rates of anticipated new users that would be necessary to render a 10G SSNIP unprofitable. During the closing submissions Professor Cubbin invited Ofcom's counsel, Mr Holmes, to provide the Tribunal with a plausible scenario in which the number of new 10G users who could be anticipated would be lost was such that a 10G SSNIP would be unprofitable. Mr Holmes declined to provide such a scenario.[41] Moreover, whilst it would clearly have been possible for Ofcom to have created a table of critical loss factors equivalent to that at Table 2, Ofcom did not do so. We are therefore not in a position to conduct even a rudimentary 'sense check' of Ofcom's case of the type described by Ms Curry at paragraph 292 above. (emphasis added)

'304. In summary, Ofcom's reasoning in the FS regarding the 10G SSNIP has been shown to be materially flawed both in relation to downward migration and as to its assessment of BT's internal documents and stakeholder responses. Ofcom was also not able to reassure the Tribunal that even a single plausible scenario exists where a 10G SSNIP would be unprofitable. In those circumstances, we do not consider that Ofcom's conclusion that a 10G SSNIP would be unprofitable can stand.' (emphasis added)

36. It remains the case that Ofcom has still not advanced any fresh evidence as required by the CAT or presented any plausible scenario where a SSNIP at 10G would not be profitable. Indeed, Ofcom's own conclusion in effect confirms this:

'Our initial view is therefore that substitution to 1 Gbit/s is likely to be insufficient to render a SSNIP at 10 Gbit/s unprofitable. Together with our substitution analysis from 1 Gbit/s to 10 Gbit/s, this analysis suggests that demand-side substitution between 1 Gbit/s and 10 Gbit/s is likely to be weak in both directions.'[99]

Groups of products constituting markets

(i) 100M and 1G

37. Even if it was considered ambiguous as to whether 1G is in an economic market of its own, the combination of 100M and 1G would be very profitable as no 100M customers at a monopoly price would migrate up to 10G at a competitive price or down to 10M at a competitive price. The 100M customers would be trapped paying the monopoly prices at 100M or 1G and Openreach could capture significant profit as Ofcom postulates.[100]

38. It is possible to quantity the effect of combining 100M and 1G on the boundary between 1G and 10G by extending the standard calculation of critical sales loss (CSL).

39. For a single focal product, for example 1G, the critical sales loss (CSL), l_{1G}, is the proportionate loss in sales needed to render a SSNIP, s, unprofitable. The CSL will therefore be at a point where the profit before and after the SSNIP are the same. That is

$$(p_{1G}(1+s) - c_{1G})v_{1G}(1-l_{1G}) = (p_{1G} - c_{1G})v_{1G}$$

where p_{1G} is the price of the focal product, c_{1G} is its avoidable cost, and v_{1G} is the volume of sales prior to the SSNIP. This can be simplified and this states that the change in profit is zero:

$$sp_{1G}v_{1G}(1-l_{1G}) - l_{1G}(p_{1G} - c_{1G})v_{1G} = 0$$

Writing the price-cost margin as $m_{1G} = \frac{p_{1G}-c_{1G}}{p_{1G}}$

$$s(1-l_{1G}) - l_{1G}m_{1G} = 0$$

$$l_{1G} = \frac{s}{s+m_{1G}}$$

This is the standard formula for CSL.

40. However, if we now consider the situation where the hypothetical monopolist is trying to monopolise both 100M and 1G, the SSNIP applies to both products simultaneously and the condition for the CSL of each of the products l_{1G} and l_{100M} is now as follows.

$$(p_{1G}(1+s) - c_{1G})v_{1G}(1-l_{1G}) + (p_{100M}(1+s) - c_{100M})v_{100M}(1-l_{100M})$$
$$= (p_{1G} - c_{1G})v_{1G} + (p_{100M} - c_{100M})v_{100M}$$

99 A8.77 BCMR 2019 consultation

100 4.22 BCMR 2019 Consultation

This simplifies to:

$$sp_{1G}v_{1G}(1-l_{1G}) - l_{1G}v_{1G}(p_{1G}-c_{1G}) \\ +sp_{100M}v_{100M}(1-l_{100M}) - l_{100M}v_{100M}(p_{100M}-c_{100M}) = 0$$

Writing in terms of the price-cost margins of the two products, this becomes:

$$s(1-l_{1G}) - l_{1G}v_{1G}m_{1G} + \frac{p_{100M}v_{100M}}{p_{1G}v_{1G}}(s(1-l_{100M}) - l_{100M}m_{100M}) = 0$$

41. The Ofcom assumption in Annex 8 is that the predominant switching in response to a SSNIP is upward in bandwidth e.g. from 100M to 1G and from 1G to 10G. However, in this scenario as 100M and 1G are both monopolised and subject to the SSNIP, this will not induce any switching from 100M to 1G as prices rise for both products. Moreover, given the assertion is a chain of substitution, any switching directly from 100M to 10G as a result of the SSNIP is highly implausible. Therefore, it is safe to assume that loss of 100M is minimal, that is $l_{100M} \approx 0$.

42. The CSL for 1G can therefore be calculated as:

$$l_{1G} = \left(1 + \frac{p_{100M}v_{100M}}{p_{1G}v_{1G}}\right)\frac{s}{s+m_{1G}}$$

43. This has the same form as for the single focal product but is now amplified by the revenue ratio of the two products. This amplified form is the CSL which relevant to the establishment of a single product market across all bandwidths and not the CSLs as set out by Ofcom in Table 4.1.

44. It is possible to augment Table 4.1 on this basis using the TCO prices from Annex 8 and the volumes from Table A11.3.

Table 2

CSL for a two product economic market

Focal Product	Volume	Proportion of customer circuits switching
10M	141	14-17%
100M	33,879	14-17%
100M with 10M	33,879 + 141	14-17% (of 100M customers)
1G	11,817	13-14%
1G with 100M	11,817 + 33,879	36-45% (of 1G customers)
1G with 100M and 10M	11,817 + 33,879+141	36-45% (of 1G customers)
10G	885	12%

45. We note that the evidence before the CAT as recorded in the Judgment[101] was that only between 5-8% of 1G customer circuits were in the cohort of 2x1G which *might* potentially switch to 10G under a SSNIP at 1G.[102] Even if all these circuits were to switch, this is still well below the 13-14% threshold clearly suggesting that

[101] Judgment, para 293

[102] In fact, there was no evidence at all that these customers would switch in response to a SSNIP. For example there was one customer which had 16*1G on a route. Customers will have other reasons than price alone to purchase multiple 1G circuits.

1G is an isolated market. However, when the scenario is correctly constructed whereby 100M and 1G are already combined, there is no plausible possibility of approaching anywhere close to the 36-45% CSL threshold required to further combine this market with 10G in a chain on substitution.

46. This required level of switching will be generally very robust to changes in the respective prices. With 1G to 10G, it so happens that the SSNIP changes the cheaper option between 2x1G and 10G and so the argument is that this will induce switching in this cohort. However, for reasons just given this is questionable anyway; it would take a very large decrease in the 10G to bring the single 1G cohort into play and so the extent of switching is likely to be fairly stable between the current 10G price and the current 1G price.

(ii) 10G and optical services

47. Starting with 10G as a focal product, it is worth monopolising in itself. Ofcom however does not examine optical services and for the backhaul sectors it seems just as likely that monopolisation of these plus 10G would be just as profitable as the combination of 100M and 1G in business access. The possible product chain for backhaul would probably not extend down to 100M which is not widespread here although there are some circuits at this bandwidth between BT exchanges.

(iii) Overall position on a complete chain

48. The conclusion drawn is that a chain of substitution on the demand side from 10M up to 10G and possibly optical services would only be possible under three extreme assumptions none of which is plausible. The first two assumptions would require starting the analysis at 1G as the focal product and then adding in 100M for business access and 10G for backhaul.

49. The third requirement which is even more unlikely, is that the equilibrium 1G price is then common to both business access and backhaul and any perturbations in competitive prices would automatically filter through between the three sectors. This however is not supported by Ofcom's own analysis in Annex 9 and likely competitive price levels under MGA. BT has set out its position in the past that the three sectors do differ materially. Certainly, the backhaul sectors are very different from business access although have a degree of similarity with each other and which may increase over time to the extent that backhaul networks converge in design and implementation.[103]

50. This issue was the source of some disagreement between the Experts JER [57] although this appeared to relate to the potential for discrimination within the business access sector itself which is highly varied as discussed above rather than between business access and the two backhaul sectors. In the 2016 Appeal, BT and other parties explained that the tendering for example for backhaul could be over a lengthy period and implementation could take a couple of years which is all very different from business access.[104] It is notable that the only evidence put forward by the DoE in this regard related to evidence from CP documents, and this was rejected by the CAT.

51. The issues of pricing interactions at extremes of a chain of substitution and whether prices should be orders of magnitude were the source of some disagreement in the Appeal JER [21-22]. Ofcom's own demand-side analysis in effect confirms the underlying truth that for a chain of substitution to be possible, it requires some very strong assumptions indeed. Where prices and competitive conditions are very different between

[103] See JER [64-65] on this matter.

[104] See the witness statements of Mr Logan for example.

customers/sectors, it is far more likely there are pockets of services 'somewhere in the middle' which would be worth monopolising. There is seems to be little doubt that this is the case here.

Interpretation of internal Openreach documents

52. For the SSNIP at 100M, Ofcom cites documents on relative price sensitivity and migration.[105] Openreach does not consider that Ofcom has characterised these papers correctly. The relevant two quotes appear to be the following:

[redacted]

and –

[redacted]

53. The first quote actually suggests that there will not be much switching just because the connection charge is the same on 100M and 1G but that 'it will be limited'. The second quote supports the suggestion that *some* CPs would be willing to pay more for additional bandwidth. However neither of these Papers supports the assertion[106] of *substantial* migration. The Paper for the October 2018 price reductions where EAD 1G prices were reduced says that it will help support the existing trend in the market to shift from 100M to 1G, not that Openreach expected a significant change in buying behaviour:

"The chart on the right shows the EAD 1000 installed base as a proportion of the combined installed base of EAD 100 and EAD 1000. It shows a steady trend toward a greater proportion of EAD 1000 in the base, compared to EAD 100. The proposed price reductions in this paper and the potential introduction of a remote upgrade facility from EAD 100 to EAD 1000 in 2019 could continue to support this trend and could establish EAD 1000 as the main product in the business Ethernet portfolio rather than EAD 100."[107]

54. In summary, Ofcom's interpretation and quotation is selective, and does not provide support for Ofcom's conclusions.

105 A8.30-4 BCMR 2019 Consultation

106 A8.32 BCMR 2019 Consultation

107 Leased Lines Charge Control Ethernet Prices for October 2018 v1.4.docs Page 9

IV. SUPPLY-SIDE SUBSTITUTION

Ofcom's approach

55. Ofcom cites[108] Commission Guidance and previous Ofcom practice of distinguishing supply-side entry sites where multiple competitors i.e. more than one are connected to a site and where only one provider is connected to a site.[109]

56. Ofcom sets out its case[110] that when connected, a CP can upgrade relatively quickly and at low cost. Ofcom effectively concludes that this forms supply-side entry, and as far as we can deduce, is the primary basis for the assertion of a chain of substitution in the product market.[111] The other possibilities of supply-side entry where competitors do not have presence shows that competitive conditions do not vary by bandwidth. (That the demand-side analysis is supposedly 'ambiguous' does not really matter according to Ofcom as supply-side aspects 'prove the case'.)

57. As will be developed in some detail below, these assertions are strongly contested. In the first instance where competitors are already present, Ofcom is mistaken to assume that this constitutes supply-side entry under the HMT. The second scenario of only one supplier actually present and which is likely the most common situation – would constitute supply-side entry but the likelihood that this would support a single product market is contradicted by Ofcom's own evidence both theoretical and empirical. It contradicts that the value of the site is the primary driver of extending networks.

58. More generally, the guidance of the Competition Commission states the following:[112]

> *'The boundaries of the relevant product market are generally determined by reference to demand-side substitution alone. However, there are circumstances where the Authorities may aggregate several narrow relevant markets into one broader one on the basis of considerations about the response of suppliers to changes in prices.'*

59. This suggests it would be exceptional for a supply-side entry to support a wide product market.

Where suppliers are already connected

60. Ofcom's commentary [4.42-4.46] based on Openreach and Virgin Media is not correct in all points particularly with regard to upgrade from Ethernet to optical services. This is not relevant to the point Ofcom is making as none of these potential upgrades do not constitute supply-side entry in any case under the HMT.

61. Ofcom discussed supply side entry in the 2013 and 2016 BCMR statements.[113] In these statements the risk of double counting where there are two suppliers at a site is discussed.

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108 4.38-40 BCMR 2019 Consultation

109 We note that Ofcom does not provide any empirical evidence for the proportion of sites at which there are multiple network providers. This is in stark contrast to the analysis of BT exchanges where every exchange is treated as its own market and an explicit assessment is made of the number of CPs present at each exchange

110 4.41-9 BCMR 2019 Consultation

111 4.67- 9, 4.77 BCMR 2019 Consultation

112 Para 5.2.17 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284449/OFT1254.pdf

113 BCMR 2013 statement A327-28 and 4.127-131 specifically relating to VHB.

62. It is not permissible to count operators who are already providing a competing service to the customer which has been assessed as a potential competitive product on the demand side – 'Such operators are not relevant to supply-side substitution since they supply services already identified as demand-side substitutes'. What Ofcom is correctly saying here, is that the operator has to be in a *distinct* market but able to expand at relatively low cost as *new* entry into the market which was first assessed using demand-side principles as is the convention in such studies.

63. The 2013 Statement had specific discussion[114] on supply-side substitution within the VHB market above 1G and it is evident that even here for high value sites Ofcom[115] discounted supply-side entry.

64. In the 2016 Statement, Ofcom[116] emphasised that precise labelling was less important than ensuring that there is no 'double-counting' which was the point made in the 2013 Statement. Ofcom[117] then describes supply-side entry as a geographic facet of markets.

65. Where competitors are present at a site, there is no geographic dimension by definition as there is no cost of expansion and that means that looking at this scenario is in fact double counting. Openreach considers Ofcom is doing this by stating that supply-side entry exists where competitors are already present at a site but possibly supplying a service at a different bandwidth.

66. Consider the hypothetical example of where Openreach supplies a 100M service and the CP a 1G service.[118] If the SSNIP is applied to the 100M service as the focal product then the customer is incentivised to move up to a 1G service. The CP is already supplying this at the competitive level and it is a matter of pure demand-side substitution, as Ofcom set out in the 2013 and 2016 BCMRs. It is not supply-side entry as the CP is 'already in the market'. A similar scenario would arise with the CP providing the lower bandwidth and Openreach the higher bandwidth and trading down as a possibility. A final possibility is that both the CP and Openreach are supplying a service at the same bandwidth to the customer. Then the HMT will monopolise both services in any case and the CP effectively 'disappears' from the analysis altogether.

67. The conclusion here is that Ofcom's first case example of multiple suppliers present at a site is irrelevant as it is not supply-side entry under Commission Guidelines.

Where suppliers do not have an existing connection

68. Ofcom argues[119] that competitive conditions will be the same across all bandwidths because the cost of extending network is similar at all bandwidths. This however is just the cost side of the equation and totally ignores two key relevant factors which are revenue and timeframe.[120]

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114 4.127-4.131 BCMR 2013 Statement

115 4.131 BCMR 2013 Statement

116 4.237 BCMR 2016 Statement

117 4.240 BCMR 2016 Statement

118 As noted Ofcom provides no evidence of any preponderance of such sites which are more likely to be data centres in any case and deregulated anyway. A more plausible situation is that the customer has migrated between providers and that one operator has simply left inert fibre to the site which in theory could be made active again.

119 4.51 BCMR 2019 Consultation

120 See also the Judgement [307-311] on this matter.

69. As a general observation, all of Ofcom's analysis here[121] is really an exercise of static equilibrium and has nothing really to do with the application of the HMT. In the 2016 BCMR Statement, Ofcom[122] in effect accepted that supply-side aspects did not enter the market definition stage at all but were really subsumed subsequently within a geographic market/SMP assessment.

70. If, however, Ofcom now wishes to show that supply-side factors are important, it has to demonstrate that operators can expand their networks within the timeframe of the SSNIP itself, as noted in the 2013 BCMR Statement,[123] as agreed by the Experts in the Appeal JER [8]. Ofcom provides no evidence that operators would either have the incentive or the ability within the HMT period of roughly a year to expand their networks from the current infrastructures in response to a SSNIP for any product whatsoever.

71. In the response to the SMP Access assessment of Section 6, Openreach cites CMA guidance on supply-side entry and sunk costs and potential entry. If sunk costs are a factor with which to attribute Openreach with SMP then they cannot simply be avoided for supply-side entry for off-net circuits.

72. Ofcom's analysis shows[124] the opposite of what is claimed that all bandwidths/sites are of similar interest. Even the differences between 100M and 1G are considerable putting to one side the wider gaps between 1G and 10G.

73. Ofcom asserts[125] with that BT's VHB prices are distorting the results of the dig calculations. The gap between the 1G and 10G is however very large and Ofcom uses the October 2018 1G pricing reduction to justify the linking of 100M to 1G as noted above in which case the economic dig distances will still be very different.

74. Ofcom[126] draws no real conclusions in an HMT context on evidence of actual dig distances. As noted, the HMT looks at incentives following a SSNIP so this analysis is not of direct relevance anyway. What it does suggest is that the sites of interest are already served and that the extent of future infrastructure expansion for businesses may not be significant, but this ignores DPA.

Evidence on customer inconvenience

75. Ofcom provides no explanation given as to why this issue of switching suppliers is relevant in an HMT thought experiment. To the extent that customers are inconvenienced as Ofcom claims,[127] this suggests that supply-side entry is even less likely. It simply means that no operator will expand in response to a SSNIP as neither they nor the customer will find it worthwhile.

76. In practice, customers will typically parallel run when they change suppliers and this is all managed in the tendering process, which negates the arguments being made here (which don't appear to relate to the consideration of supply side entry in any case).

121 4.50-4.58 BCMR 2019 statement

122 4.243 BCMR 2016 Statement

123 4.128 second bullet, BCMR 2013 Statement

124 Table 4.2 BCMR 2019 Consultation

125 4.58 BCMR 2019 Consultation

126 4.66 BCMR 2019 Consultation

127 4.62 BCMR 2019 Consultation

V. SUBSTITUTION TO DARK FIBRE

77. Openreach broadly agrees with the conclusions[128] that dark fibre will be a likely competitor at all bandwidths where the customer is already fibre connected. The fact that an upstream competitor can be competitive at all bandwidths however is more likely to suggest that Openreach active prices are not out of line with the marketplace generally.

78. Ofcom[129] suggests that a SSNIP on 1G would still be profitable and that dark fibre and the active service are not close demand substitutes. The relevance of dark fibre entry however in a SSNIP context is not obvious as Ofcom's analysis does not look at it in the context of the relevant timeframe as discussed above. Clearly dark fibre must be some sort of substitute as Ofcom mandates this as a remedy in the IEX market. Ofcom also quotes service shares including dark fibre for VHB services in Annex 14. We therefore believe there is an impact that has not been fully assessed.

VI. SECTOR DIFFERENCES

MNO backhaul

Issue 1: should MNO backhaul be treated separately?

79. We broadly concur with Ofcom's description of the purchasing patterns of MNOs as set out in Annex 9. Specifically, we note that Ofcom accepts[130] that BT's share of supply is potentially unstable from the nature of the market with comparatively few contracts being awarded on a sporadic basis. However this seems to contradict Ofcom's approach to the SMP assessment which uses connections just in 2017. We also note that in this Annex, Ofcom does not restrict its discussion ostensibly about the product market but rather comes to its conclusions on a much wider competitive assessment encompassing aspects of geographic markets, market power and even the position of downstream BT Wholesale.[131]

80. In this context it appears that Ofcom has again departed from its previous approach as set out in the Report of the DoE [625-626] which explicitly argued against analysing product markets in this fashion. This is an issue of considerable importance as Ofcom seamlessly aggregates all the circuits from MNO backhaul along with business access and business backhaul into single statistics. However, in Annex 9 Ofcom explicitly accepts the possibility that this approach may not be correct and no sensitivity testing has been done here on alternative scenarios that MNO backhaul should be separately classified from business access.

81. This however is to miss the point which is that the nature of the 'product' for MNO backhaul is an upstream solution of some sort in which the technical and commercial characteristics may vary from one supplier to another. There is also the potential for a mixture of passive and active services with bespoke terms.

82. That BT's share of supply to MNOs is allegedly very high across all geographies [A9.31] says nothing about the nature of competition at the point at which the original contracts for provision were made and further detail on this is provided in the response to the SMP Access assessment in Annex E. This is of particular

128 4.72-4 BCMR 2019 Consultation

129 A8.73 BCMR 2019 Consultation

130 A9.32 BCMR 2019 Consultation

131 A9.28-30 BCMR 2019 Consultation

importance given that Ofcom consolidates the purchases for both MNO and business backhaul using 2017 connections.

83. For these reasons, Openreach believes that the two backhaul sectors of MNO and business backhaul are very different from business access and likely do require separate analysis at the minimum in terms of competitive conditions in future reviews.

Issue 2: the analysis of BT's downstream position

84. Ofcom in its treatment of BT Wholesale[132] offers only general observations about potential economies of scale and scope which in any case relate only to BT's network. We believe a parallel analysis should be undertaken for supply of MNO backhaul for example in the Virgin Media footprint to see whether or not such alleged economies are matched or even exceeded by other operators. Ofcom appears to be arguing for a 'leveraged dominance' between downstream and upstream markets which is decidedly unusual in market analyses of this kind.

Issue 3: Switching costs

85. Ofcom[133] asserts that switching costs are likely higher for MNOs than business access customers. However, this is not in proper context that the MNOs are often able to exercise countervailing buyer power to acquire terms which suit themselves as Ofcom[134] explicitly acknowledges. The comparison therefore between the two sectors is not meaningful.

86. The fact that there are contracts likely extending beyond the timeframe of an HMT or SSNIP thought experiment, means that some caution is appropriate in all such analyses of this kind. There are in fact a number of implicit assumptions made when calibrating a CSL including uniform pricing and approximations in the demand elasticity for example. Nevertheless BT/Openreach has supported doing such calculations as a useful exercise to provide a context to wider issues for example on possible sector differences and so forth.

Issue 4: Exclusion of microwave

87. It is very difficult to see why Ofcom should exclude microwave from this market given that according to Ofcom itself[135] 'it is widely used by MNOs'. It is also difficult to reconcile this with the subsequent statement made by Ofcom[136] that 'it is only viable for a limited proportion of sites'. Under the MGA Ofcom should allow for microwave to form *some* competitive constraint on pricing of fibre connections.

88. BT does not have visibility of the redacted information in Table A9.1 but to the extent that there is variation in the proportions used in the three operators, it would suggest there is an element of strategic choice being exercised. Again this could point to treating MNO backhaul as a distinct sector from business access.

132 A9.28-9 BCMR 2019 Consultation

133 A9.33 BCMR 2019 Consultation

134 A9.37 BCMR 2019 Consultation

135 A9.11 BCMR 2019 Consultation

136 A9.15 BCMR 2019 Consultation

Annex E:
Comments on Ofcom's CI Access geographic market definition

Contents

I. SUMMARY

1. Openreach has concerns on a wide range of issues in the Geographic market boundary methodology:

   - Ofcom continues to use a notional database for potential demand which is shown to be biased to understate the likely presence of rival infrastructures to provide CI services.
   - The absence of key competitor information on circuit locations is unacceptable as this is critical to perform a sense check on the conclusions by using actual circuit connections.
   - There are other reasons to believe that the use of fibre flexibility points for some CPs rather than the duct network itself will lower the estimated coverage of rival networks. (Openreach supports in principle the move to use actual duct networks rather than fibre flexibility points.)
   - The 50m rule is not necessarily correct under a Modified Greenfield Approach (MGA) and there are issues of the accuracy of being able to plot rival infrastructures within this range and examples are provided showing this.
   - The sensitivity analysis indicates that the 65% coverage threshold is likely too high and in the light of other factors which tend to understate rival infrastructure presence, Openreach argues for a 50% threshold.

2. Openreach believes that this revised approach like the Product market does not meet the requirements of the CAT as expressed in the Judgement. Too few postal sectors are identified as HNR arising out of a combination of the methodological issues summarised above. Further, we believe Ofcom should have

considered the geographic markets for different bandwidths as they impact Ofcom's tests and would likely support that VHB should be treated as a separate product market.[137]

3. For a short duration of this review period the impact of some of the analysis will be limited, however we would expect that at the very least all these points to be addressed fully (along with all the CAT recommendations) in the forthcoming Integrated Market Review.

II. APPROACH TO GEOGRAPHIC MARKET DEFINITION

Use of notional business sites

4. In order to model the geographic distribution of the demand for CI services, Ofcom has again used a commercial database of the postcodes of business sites. Ofcom has stated that the intention was to use to the actual circuit inventory but have chosen not to do so due to concerns of the quality of the data.[138] Ofcom has therefore continued to select all the sites of businesses that employ 250 or more, people in the UK.[139]

5. BT has previously raised concerns that this selection is not representative of leased line demand as it is skewed towards companies and organisations that have a large number of small sites such as retail companies.

6. The example BT used previously to illustrate this likely phenomenon of wrong sample focus was 'Timpson', a British multinational retailer specialising in shoe repairs, key cutting and engraving, as well as dry cleaning and photo processing. It is based in Wythenshawe, Manchester, and currently has well over 1,000 outlets in the United Kingdom and Ireland[140] and employ 4,700 people.[141] Research shows that in 2016 they selected Calteq to manage their communications needs who in turn sourced access connectivity from Entanet.[142] The solution was as follows:

"(a) *IP-VPN solution that included 1,600 ADSL connections to provide data connectivity to the high street stores…. plus a leased line for high-speed, secure connectivity to its head office*".

7. Timpson was expected to expand to more than 2,000 ADSL connections by the end of 2016. None of the Timpson high street stores require CI services which are only needed at a single site.

8. Another example is for the network of Ryman Ltd where Entanet also supplied the network service.[143] While ADSL and ADSL2+ broadband connections support data and voice communications to each of the 237 nationwide stores, only two leased line services are required, to the head office (100M) and the back-up data centre (1G).

137 As Set out in the CAT Judgement para 392.

138 A12.13 BCMR 2019 consultation

139 We understand that now it includes Local Government and other non-commercial organisations.

140 https://www.timpson.co.uk/about-timpson/

141 https://en.wikipedia.org/wiki/Timpson_(retailer)

142 https://www.enta.net/downloads/casestudy-calteq.pdf

143 https://www.enta.net/downloads/casestudy_ry.pdf

9. These are not isolated examples from the retail sector. Table 1 below provides further examples where moderately large retailers are employing solutions to most of their sites including banks (RBS, Co-op Bank, Vocalink), car hire and a London local authority.

Table 1

Examples of network solutions

(Number of access circuits)

Company	Broadband	EFM	100Mb	1G	10G
Avis	109	-	4	-	-
RBS	99	36	146	-	-
Co-op bank	222	-	18	-	-
Vocalink	6	46	24		
Borough of Wandsworth	158	-	23	-	-

10. This data shows there is no "one size fits all" network design for business, and that CI services are not required at every location.

11. We believe many other High Street chains and non-commercial organisations have similar bandwidth demand profiles with the vast majority of sites only requiring broadband-based services. In reality, these are lower value sites which have not attracted significant alternative network build and CPs can acquire connectivity through other regulated products. Openreach will be attributed with market presence for sites where it is not relevant to this market review and CPs unable to offer service when there is no need for anyone to provide CI services anyway.

12. Overall, it is thought plausible that at least one third of the Ofcom dataset of 164k+ sites which enter the coverage algorithms have no relevance to this market review and will bias the findings generally to find rival infrastructure providers with lower coverage than is actually the case.

13. Data presented in this Consultation[144] indicates that few new sites were connected in 2017. Openreach has estimated this to be between 6,000 and 7,000 new network connections in 2017. If this is representative of new build, then over the course of this two-year review period, there could be an additional 12,000- 14,000 new buildings connected. Such a low proportion of new build to the total business sites in the database suggests that the CI market demand has been largely built to already.

14. We believe that using actual and plausible future real connections will result in a smaller error of coverage than persisting in using a theoretical geographic site demand database which includes many thousands of sites that are currently served by broadband services and unlikely to need CI services during this two-year review.

[144] Table A11.2, row C

15. In fact, Ofcom has already chosen to use this approach for the geographic demand for mobile base station connectivity by using the existing fibre-connected sites, and not attempting to model any future demand. Openreach considers that Ofcom should adopt a consistent approach to these two groups.

16. In the 2013 market review, Ofcom[145] looked at the correlation of HNR areas based on their modelled distribution versus actual circuits. This used the previous HNR methodology, based on a 200m reach distance to a nominal point in a postcode. It also used the locations of all circuits including low bandwidth TI circuits and the inventories dated back to 2011.

17. We believe Ofcom should perform similar analysis in the current (and future) market reviews. The theoretical modelling needs to be cross referenced to actual CI circuit locations to validate the modelled distribution. Without this, we see no evidence that Ofcom's approach proposed here is correct, given that have been able to provide examples that shows it overstates CI locations.

Inadequate competitor information provided

18. In practice, Openreach appears to have been penalised in the formulation of geographic markets and in the related SMP assessment due to the inability of a major competitor to provide reliable data. This should be remedied ahead of the Integrated Access Market Review.

Postcode sectors with no sites

19. There are about 800 postcode sectors with no sites of large businesses or 8% of all sectors.[146] A coverage cannot be calculated if there are no business sites, so Ofcom assumes there is a business site in every single postcode within the postcode sector. This cannot be correct and is a totally unrealistic distribution of sites. Given that Ofcom has data on actual sites that purchase CI services this should have been used in preference to assuming businesses are spread across all postcodes, many of which will be solely residential. Ofcom's approach introduces a further bias against Openreach.

Rival networks and buffer distance

20. We welcome the change in Ofcom's methodology[147] to '*measure the extent of a network based on the location of an operator's duct'*. Previously Ofcom benchmarked the notional 'dig' distance against observed physical build and BT has always maintained that measuring from fibre flexibility points underestimates the potential coverage of competitor networks.

21. We are however concerned that although Ofcom states that the measurement is from duct locations, in fact duct networks were not available from all infrastructure providers and their fibre flexibility points were used instead.[148] This will understate the true "footprint" of these operators.

22. As Ofcom has not published which operators this applies to nor even the number of such operators affected, it is not possible for Openreach to estimate what the likely impact of this will be. Without further clarification we believe that the results of the new network reach analysis are unreliable. Whilst we understand that

145 2013 BCMR Statement 5.130 and Figure 5.13, March 2013.

146 A12.62 BCMR 2019 consultation

147 5.15 BCMR 2019 consultation

148 A12.7-8 BCMR 2019 consultation

certain operators may not have adequate duct records, to simply use a subset of locations is not really acceptable; one solution might be to use a longer reach distance for those specific operators.

23. With regard to the buffer distance, there are two separate concerns. The first is the fundamental issue of what the appropriate distance is and the second concerns the ability to model to such accuracy in any case.

24. Ofcom's change in approach to use the location of operators' duct networks means that conceptually it is now appropriate to benchmark the reach distance to economic 'dig' distance. We believe that the use of observed dig distances in 2017 does not meet the requirements of a Modified Greenfield Approach.[149] These network extensions happened when there was a regulated remedy in place for this market which clearly would have influenced the build/buy decision resulting in shorter average distances being observed than in the absence of such a remedy.

25. Additionally, it is planned that for the period of this review there will be a significant change to the upstream regulation and an unrestricted Duct and Pole Access (uDPA) remedy will be in place. This change has not been accounted for in the economic build distance calculation in Annex 10. Given the availability of DPA the true economic distance will be several hundred metres. Please refer to the BT Group response which discusses this in detail.

26. Even in the absence of DPA, the choice of 50m cannot be justified on the data publicly presented. Ofcom has redacted much of the data in Annex 11 which supports this decision, which makes it difficult to comment on its validity. However as network build is a long-term investment we do not agree with using a three-year payback period in the assessment.

27. A further fact which was of considerable focus in the 2016 Appeal, is that the results also clearly show the impact of the value of the site. In the presented data, Ofcom has chosen to use a single Openreach 100M, 1G or 10G EAD service, but in reality, an operator will assess the value of the site and the ability to provide additional services in the future and not just the current demand. The results of modelling[150] clearly demonstrate that there is a higher degree of competitive constraint on high value sites and using a uniform reach distance is not appropriate. Even for a single 1G circuit, the economic distance for an operator to install its own duct network of 69m is longer than the length that Ofcom chooses for its analysis.

28. The fact that many of the dig distances were short in 2017[151] provides no real insight into the distance an operator would dig to a new customer. All this shows is that many digs were shorter than the economic dig distance. For the same reason, median and mean distances do not help with the understanding of the economic dig distance. Ofcom states that close to 80% of the observed dig distances were less than 50m,[152] which means that 20% were longer than 50m and of these 15% were longer than 100m. Ofcom dismisses this evidence as these were predominately observed for the 'build-only' providers, but these are the ones which probably represent the results that are closest to a MGA situation. Therefore even in the absence of DPA, we believe the economic dig distance under a MGA scenario should be in excess of 100m in line with the long dig distances for build providers.

149 See the JER on Geographic market Issue 'Choice of buffer distances for Boundary Test and High Network Reach thresholds No. (I)' in particular.

150 Table A10.6 BCMR 2019 Consultation

151 Figure A11.6

152 A11.35, first bullet BCMR 2019 consultation

29. The second point to address is the fundamental accuracy of Ofcom's Network Reach analysis. Ofcom has always been very cognisant of the limitations of the geographical analysis. In the June 2012 BCMR Consultation Ofcom[153] stated that *'Using a buffer distance below 200m will result likely in several cases where a site appears to have no network within reach while in reality the buffer intersects the boundary of the business'*.

30. In 2015, when Ofcom proposed the Boundary Test using a distance of 100m, the Consultation included data[154] on the area occupied by postcodes and the theoretical radii if the area was circular. It was argued that for the urban areas Ofcom were focused on, that over 96% of postcodes (in the Central London Area, London Periphery or Central Business Districts) had a theoretical radius of less than 100m. BT repeated this analysis for the London Periphery, but additionally calculated the number of business sites rather than number of postcodes.[155] This showed that 10% of businesses were in postcodes with a theoretical radii of more than 100m.

31. What is concerning now is that Ofcom has reduced this reach (from 200m for HNR and 100m for the Boundary Test) to just 50m. We cannot see any analysis to understand the impact on the accuracy of the analysis by using such a short reach value. Referring to our results from 2015, over 40% of business sites are in postcodes with a radius of greater than 50m, meaning the results of Ofcom's reach analysis could be incorrect for 40% of the sites they are examining.

32. An examination of a map of an area can demonstrate examples of this. BT has previously used the example of the area around Park Royal (Postcode sector NW10 7) and Figures 1, 2 and 3 show areas around three large customer sites; an Asda supermarket, Central Middlesex Hospital and a McVitie's Factory.

33. As can be seen, even if there was rival duct network in the streets around the sites, all three sites would fail the network reach test at 50m as the centre of the postcode in the site is more than 50m from the road, though the network termination point would not be. These are not extremes and we suggest that Ofcom should consider its previous expressed views on this matter and not rely on the results of a 50m reach analysis which may be inaccurate.

153 Footnote 43 to para 5.98 BCMR 2013 Consultation

154 Table A15.1, Annex 15, BCMR 2016 Consultation

155 August 2105, BT Response, Part B, Table 1.

Figure 1

Asda Supermarket at NW10 7LW showing 50m buffer

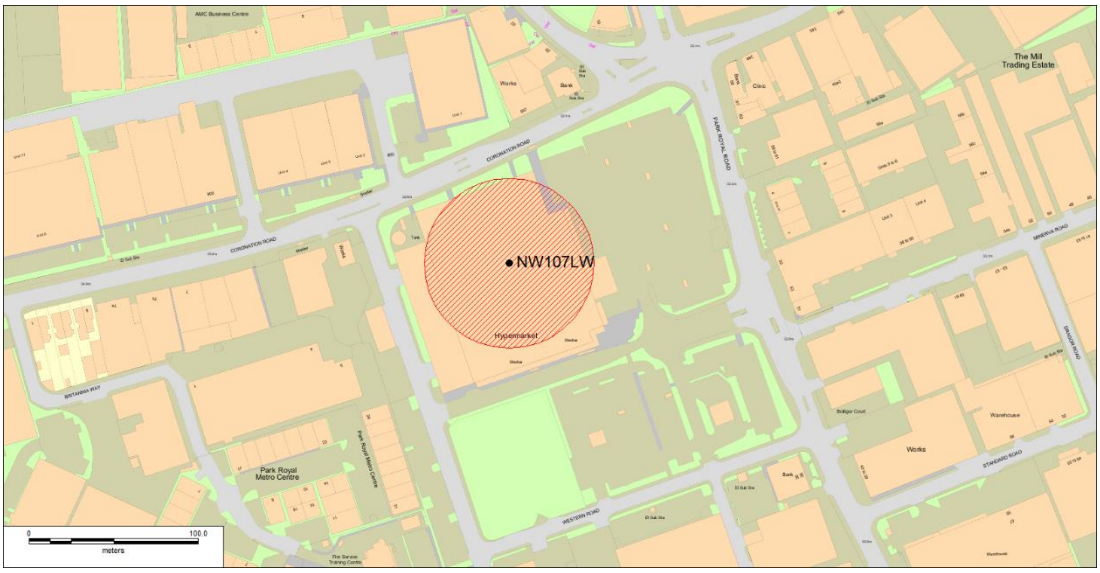
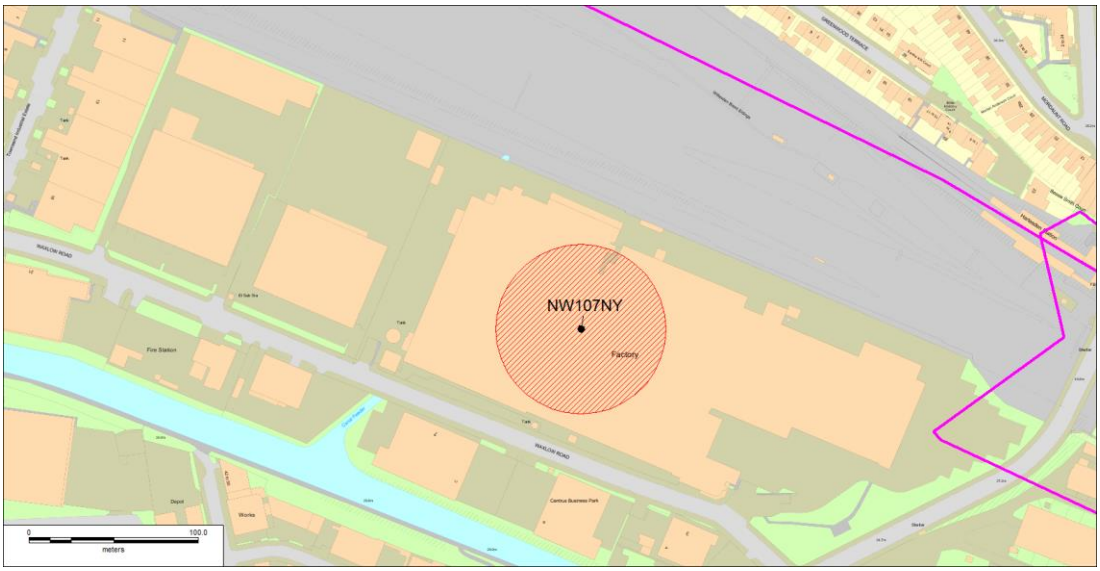


Figure 2

Central Middlesex Hospital at NW10 7NS showing 50m buffer

Figure 3

McVite's Factory at NW10 7NY showing 50m buffer



34. Another point to demonstrate the potential exclusions in error that can be made with the 50m distance is by considering the results presented in the Consultation in the IEX market definition. Table A12.19 presents the network reach for BT exchanges. The BT+1 and BT+2 or more categories are based on an assessment of the number of operators that are currently connected in the build with their fibre network. Therefore, for all BT+1 exchanges the closest network should be at zero metres. For BT+2 or more, both the closest and second closest should in theory also be zero. The median for these three cases are 25m, 21m and 35m and the corresponding average (mean) distances are 33m, 24m, and 62m.

35. The large difference between the median and mean implies a tail of longer distances. Focusing on the longest distances (2nd closest to BT+2 or more), shows that for half the sites the distance is greater than 35m and the average is 62m. For this cohort of 575 exchanges that are already connected by two or more fibre networks, many would not meet the 50m reach threshold. This further demonstrates the likely inaccuracy of Ofcom's HNR process.

The sensitivity analysis in Annex 13

36. Annex 13 presents a number of detailed metrics for various scenarios when two of the key parameters are changed:

- Flexing the coverage threshold down to 50% and up to 80%.
- Flexing the reach parameter to 100m (some results for a 30m reach are included in the PIMR).

37. The 65% coverage threshold is a somewhat arbitrary number and (likely) has its history in the coverage threshold used to count Virgin Media as a constraint on BT in an exchange area in the Wholesale Broadband Access Review. The outcome in that case was relatively insensitive to the value used with limited changes when it was flexed between 50% and 80%. This is not the case here where a reduction to 50% increases the number of HNR sectors from by 196 from 576 to 772.

38. If we try and exclude CLA postcode sectors so they do not distort the analysis, the actual increase in HNR outside CLA is likely to be from 318 to about 500 – over a 50% increase in size. In other words, this assumption has a disproportionately large effect outside the CLA.

39. As Ofcom has not presented results for the currently served sites (as it is stated the installed circuit data are unreliable), we are unable to quantify the errors resulting in the use of an inappropriate demand distribution by comparison to actual sites.

40. As noted by Ofcom,[156] an increase in the buffer distance to 100m has a big impact on the numbers of resulting HNR sectors. Excluding CLA, this is estimated to rise from 318 to 985, a threefold increase.

41. Ofcom publishes[157] the average distances to rival networks. As well as for the combined HNRs (including CLA), Ofcom presents[158] the results for each city individually. It is interesting to see that the average distance to the second closest rival network, at 100m buffer and a 65% coverage ranges from 42m to 79m, with seven of the eleven numbers quoted being lower than the 62m that is the average observed for the BT+2 or more exchanges which are known to have two rival operators physically present already and requiring no new dig.

42. In summary, whilst a 50% coverage may seem low to be the appropriate competitive constraint, the inadequacies of the input data and subsequently untested assumptions that have had to be made also need to be taken into account. Ofcom is only using the business site data as the actual site circuit sites data are deemed unreliable and given these results are based on sites that include a high number that do not and will never require CI services at all a 50% threshold would not seem unreasonable to counterbalance issues with the approach.

III. GEOGRAPHIC MARKET ASSESSMENT

Application of the HNR analysis

43. As noted above, Ofcom has fundamentally changed the HNR test. In addition to shortening the reach distance and which is addressed above, it is now a threshold test rather than an average number of infrastructure providers present.

44. However, these changes are somewhat academic as they have had no impact on the areas where no regulation is applied. This is restricted to the CLA, which was defined in the BCMR 2016 using a different methodology altogether. The only impact that the HNR tests have is in the imposition of differential remedies.

45. It is worth reiterating the purpose of the geographic market definition set out by Ofcom[159] [5.5] is to identify areas "*in which competitive conditions are homogeneous and distinct from other areas in which the conditions of competition are significantly different*".

156 A13.11 BCMR 2019 Consultation

157 Table A13.4 BCMR 2019 Consultation

158 Tables A13.7 and A13.8 BCMR 2019 Consultation

159 5.5 BCMR 2019 Consultation, and also noted in the CAT Judgement para 351

46. We believe that the current methodology, which identifies only 318 postcode sectors, significantly underestimates the areas where competitive conditions are different from surrounding areas. This outcome is the result of a combination of flawed assumptions:

- Rival network operators do not build to serve complete postcode sectors and the competitive conditions vary according to the value of the sites: this is confirmed by Ofcom's own analysis discussed above.
- If Ofcom had been able to collect accurate circuit data it could have used it to assess demand but in absence of this it has used a modelled distribution that simple demonstrates that rivals have not built fibre networks to sites that can be served by broadband networks as shown above.
- Whilst postcode sectors in Central London are probably small enough that the competitive conditions are similar, outside 'super urban' areas, postcode areas are significantly larger and will include areas where there is limited network competition due to limited demand.
- The choice of a 50m dig distance is both shorter than the economic distance in a MGA, and too short for the accuracy of the input data as shown above.

Retention of CLA as a separate market

47. Ofcom has chosen to continue to use the previously defined CLA, though this was set on a different set of tests. Justification of this separate geographic market appears to be based on comparisons of network measures between CLA and other areas. However, this does not demonstrate that the boundary of the CLA remains correct.

48. There was lengthy discussion during the previous market review and the subsequent CAT appeal, over the origins of this geographic area and the basis of the thresholds chosen for the Boundary Test. The Judgment summarised this exchange as follows:

'411. At the end, however, although we were inclined to the view that BT had not made out its case that Ofcom had erred in its selection of the main parameters that went into the Boundary Test (Issues 6.1-6.3), we were left with a real sense of unease given that the account from Ofcom of the design process was incomplete and BT had been unable to cross-examine any person from Ofcom with direct knowledge of the process'.

49. We would have expected that following the Judgment, Ofcom would have clarified the application of the Boundary Test. Instead the output is used in a way which is unclear and means that stakeholders are unable to comment on it.

50. We are now in a situation where two completely different methodologies are being used to categorise the competitiveness of postcode sectors in the UK. This has resulted in there being:

- Sectors that pass the boundary test but fail the new HNR test. Some are unregulated, others are regulated.
- Sectors that fail the boundary test, but pass the new HNR test. Some of these are unregulated and others are regulated.
- Sectors that pass both tests being regulated.
- Sectors that fail both tests but are unregulated.

51. The CAT made some comments on the outcome of Ofcom's analyses here in particular in relation to the Central Business Districts[160] that we would have expected to be addressed in any subsequent consultation and still expect to be taken into account in the Integrated Access Market Review.

[160] Judgment paras 378.380

Annex F:
Comments on Ofcom's CI Access SMP assessment

I. SUMMARY

1. Openreach broadly agrees with a conclusion of SMP in BT only and BT+1 and deregulation in CLA. However we believe that HNR and Metro areas should be found to have no SMP as with the CLA, that there should be a bandwidth break for VHB (which could have different SMP findings) and that due to flawed data and methodological errors outlined in Annexes D and E, not all locations are correctly classified as BT only, BT+1 or HNR/CLA.

2. Openreach has objections to the methodology adopted to assess market power and the consequential findings, which are relevant in addition to the comments also made on the product and geographic markets.

3. Ofcom's main reliance on a single year of connections for 2017 as indicative of service share is flawed and there is no reason to conclude it would be more representative of future demand than current inventory. We strongly suspect that there are some inherent problems with the data that some CPs will have supplied to Ofcom which likely explains the implausibly high share numbers attributed to Openreach in many areas including but by no means limited to the CLA.

4. The geographic elements which are critical in particular in the assessment of competition in HNR areas outside CLA are flawed. First, from the use of the 2017 connections data which are partial and not necessarily representative of future demand and second from clear biases in the database of notional sites of demand for CI services a high proportion of which do not and will never have CI services but which are counted as if they were lowering CP presence to the sites that really do want these services.

5. Ofcom's conclusions on service shares of particular geographies are stated to be insensitive to the assumptions made on coverage and buffer distance. Ofcom provided these data only one week prior to the date of closure of the Consultation and we have not had sufficient time to fully assess the implications of this. We do provide some preliminary observations which we intend to supplement in due course.

6. Both of these issues of data set and the analysis of services shares strongly indicate that there are good arguments for saying that Ofcom has not selected areas where competitive conditions are both homogeneous within the market and different to the surrounding areas and that postcode sectors are too large to be used in these areas. This is likely an even more acute issue for VHB services.

7. We believe the analysis has been performed this way because full and accurate information has not been available from all providers, but it has introduced flawed assumptions which result in Openreach being penalised. Openreach separately does not accept the SMP assessment of VHB services as a stand-alone market where these problems are undoubtedly even more acute, and this is covered further in Annex F.

II. THE APPROACH TO SMP

The approach is not really forward looking

8. Ofcom makes an extremely strong assertion by saying:

> *'6.17 We consider service shares of 2017 new customer ends to be a reasonable measure for a forward-looking assessment of SMP. While circuit inventory may be a more complete measure of past competitive conditions, new connections focus on the most recent activity and so are likely to better reflect future market dynamics.'*

9. Ofcom provides no evidence that this is a plausible basis for forecasting future competitive conditions, which we would expect, given this is departure from any previous market reviews.

10. We assume Ofcom[161] recognises that the inventory share is the superior measure as this is adopted for the Hull area, where Virgin Media is a minor player.[162]

11. What Ofcom does not take into account in using the 2017 connections is that firstly this year was not representative as the Openreach order pipeline was being reduced so that there were more connections than orders. The Openreach numbers will be overstated as a result of this. A second factor that leads to overstatement of the Openreach numbers is that a good proportion of these connections will not represent new demand but churn from one retail CP to another on the Openreach network. We explain this further below.

The underlying analyses are not all MGA

12. Our response has identified a number of factors which have affected the conclusions drawn and which do not follow the Modified Greenfield Approach (MGA) relating to the assessments of the Product market (Section 4), the Geographic market (Section 5) and the IEX market (Section 7). These include focussing the analysis on the EAD regulatory remedy, making it less likely to find the bandwidth break downstream; the use of observed dig distances affected by regulation; likely growth in bandwidth and attractiveness of further competition at BT exchanges; and absence of consideration of DPA. These points are further discussed in other Annexes.

The relevant market shares are not provided

Issue 1: The role of service shares

13. To the best of Openreach's understanding, it is unprecedented for Ofcom to use just one year in any market review of this kind and appears inconsistent with EU standards as set out in the EC Guidelines.[163]

14. The focus on the stock of connections in economic assessment of SMP rather than current sales recognises that there may be barriers to switching (absent regulation) that a firm might be able to exploit for existing customers depending on the nature of the product and contracts and potential barriers to entry.

Issue 2: Using new customer ends connected in 2017

15. In any case, Ofcom is mistaken to place full reliance on the 2017 data for Openreach in this particular context:

    - The Openreach connections for migrations of EAD circuits will each be counted separately as a new connection and we strongly suspect that this is not how many CPs will have recorded their data which if correct will introduce a systematic exaggeration of Openreach share.

[161] A12.55 BCMR 2019 Consultation

[162] A12.55 BCMR 2019 Consultation

[163] Commission Staff Working Document {C(2018) 2374 final}. See all the text on service shares Pages 23-24.

- The volume of connections in 2017 was not in fact the same as orders placed, and the margin is quite large (around 6.5%) largely due to clearance of circuit backlog:[164] we estimate that 6% was due to backlog clearance;[165]
- For many large customers of Openreach the installed circuits in 2017 will likely have been tendered in previous years in any case and such contracts tend to be irregular or 'lumpy' as Ofcom explicitly recognises[166] and there is no reason one particular year will be representative.[167]

16. As part of the s135 requests from Ofcom, Openreach was asked to provide upgrades/regrades during 2017. This is a very specific term as far as recording instances on our system. We then included a caveat in our response stating that where a regrade/upgrade actually resulted in or involved a new circuit being ordered and an old one ceased, then our systems recorded the circuit as a new provide.

17. We strongly suspect that many CPs will not have equivalent systems in place and likely fail to record equivalent 'connections' on the same basis. Many commercial contracts with end customers are likely to include a facility for upgrade as an intrinsic part of the service and this may not be recorded in systems which will permit a response to Ofcom information requests of this nature.

18. In this matter we note that the CAT in the Judgement [278 (2)] specifically rejected the migration data from Virgin Media as being implausible:

    'If accurate, the figures would indicate that that there has been almost no migration at <u>any</u> level of bandwidth (i.e. from 10M to 100M, or from 100M to 1G) which is inconsistent with the evidence of a general upward trend.'

19. It is very difficult therefore to have any confidence in the connections data for 2017. This may well explain the implausibly high Openreach shares in CLA where Virgin Media does not have significant presence.

Issue 3: Virgin Media data

20. It is concerning that Ofcom now claims all the previous market reviews used incorrect data from Virgin Media.[168] It is entirely understandable that no systems are perfect and errors can arise, but we would expect Ofcom to work with providers to ensure they have the necessary data to carry out accurate assessments in the forthcoming Integrated Market Review.

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164 Openreach has provided Ofcom 12 December 2018 with a detailed analysis of MSL performance which explains the difference in the time intervals of order and completions. Openreach is obliged to provide circuits anywhere which will involve some areas taking a considerable time to deliver and this is not going to be the case for other CPs. The variation in order volume and mix over time means that a gap can easily occur between connections and new orders placed in any one year.

165 See the Technical Report on MSL performance given to Ofcom of 12 December 2018. Openreach has applied the same methodology here as that applied across all circuits in Section IV of that study. This indicates that 3155 circuit connections in 2017 were due to backlog clearance. Therefore, although Openreach actually completed 50,651 circuits in 2017, an efficient operator (i.e. one that was not generating a backlog at any time) would have delivered 47,496 circuit connections in that year, i.e. 6% less. This methodology takes into account the profiling (i.e. timing) of order intake and also the complexity mix of the intake.

166 7.73 BCMR 2019 Consultation.

167 It is difficult for Openreach to quantify this as the systems do not allow for such information to be readily accessed.

168 6.18 BCMR 2019 consultation

21. If the main concern is misclassification of circuits which are in fact off-net but exaggerating the Virgin Media share as being counted as on-net, then this is something that Ofcom itself could verify as Openreach has supplied Ofcom with its entire circuit database. For VHB the approach will mean that Openreach share is overstated but this fact is not made clear by Ofcom.

22. As discussed above, Openreach cannot assess Ofcom's position that the Openreach share has been understated.[169]

23. We are also concerned that there are issues with the Virgin Media data even for 2017 connections, which Ofcom is reliant on for the service shares analysis. For 2017 the database is missing a large number of the required field (25% of on-net flags, 22% invalid or missing postcodes (for connections), 20-30% of bandwidths (for inventory).[170] The missing postcode data has the added complication that it is not known if the circuit ends at a network node or a customer site. These have been distributed on a pro-rata basis, removing a proportion assumed to be 'network ends' and allocating the remaining circuits to places where Virgin Media has reported postcodes.

24. Without knowing why Virgin Media data is missing key information it is impossible to know if this pro-rata allocation is realistic; there could be a systematic reason why postcodes were not recorded for some circuits and this could easily distort reported market shares for particular bandwidths or areas or customers. There appears to be no discussion as to the error margins that these assumptions by Ofcom on a very large part of both the inventory and the 2017 connections introduce in the results for service shares.

Control of infrastructure not easily duplicated

25. Openreach has not had sufficient time to fully critique the Ofcom cost model in Annex 10. What is striking about the dig distances in Annex 10, is that the economic dig distances are often quite long and more than the 50m buffer distance where new duct is required and that economic dig distance increases by bandwidth. We would also expect the economic dig distances to increase if Ofcom had taken DPA into account in this analysis. We also note that this only covers the value from a single service and in some situations there may be greater value available from multiple services at the same location (e.g. multi-user office, or business park location).

26. In fact as far as CI services are concerned, BT does not have a ubiquitous network in the UK[171] and is obliged to extend its access network by regulation for a significant minority of circuits and at regulated prices.

Infrastructure indicators used to assess proximity of rival infrastructure to customer sites, interpretation of the infrastructure indicators sites and sensitivity analysis

(i) Background points

27. Openreach has set out its objections in Annex E of this response to the use of the 50m dig distance and the proportion of businesses within that distance. Our concerns on the use of the 2017 connections information are explained above. The cumulative combination of these with the average distance from business sites to rivals is discussed below.

169 6.47 footnote 120, BCMR 2019 Consultation

170 A12.32, A12.36, BCMR 2019 consultation

171 6.33 BCMR 2019 consultation

28. To summarise the key points made:

- The use of the nominal dataset of business sites clearly underestimates CP coverage of sites that truly require CI services. In the CLA this is probably of little importance but it will matter in many areas of BT+1 and certainly in BT+2 areas of HNR.
- The 50m distance is not based on a MGA and there is evidence that this is frequently exceeded in practice.
- The use of averages of distance from business sites has the effect of diluting the impact of competitive forces where rivals will not necessarily know how many competitors they are facing.[172]
- DPA will have a major impact which is ignored altogether.

(ii) Information varying buffer distance and coverage threshold

29. Openreach does not find the sensitivity analysis of Annex 13 addresses our concerns raised above and in particular it is not clear why Ofcom uses sensitivity testing on inventory information which it has deemed to be incorrect in any case.

30. Specifically, it is evident from Table A13.2 that changing either or both of the coverage threshold and or the buffer distance has a major impact on the classification of postal sectors. This is important as can be judged from Table A13.7 where in fact all of the average distances are actually very low. (This is in contrast to the findings in WBA when the threshold of Virgin Media set at 65% was altered as few exchanges switched between the different geographic markets.)

31. Openreach has not had sufficient time to assess the data in Tables A13.11 and A13.12 having only received the redacted information on 11 January 2019. It is our clear view however that there is something seriously amiss with the data and/or analysis here. The broad implications of the sensitivity assessments should be as follows:

- Raising the threshold of CP coverage makes a more stringent test for a postal sector to be treated as HNR and the Openreach share should fall. Lowering the threshold should do the opposite.
- Raising the buffer distance makes a less stringent test for the CP to be included and more postal sectors to be included and the Openreach share should rise. Lowering the buffer distance should do the opposite.

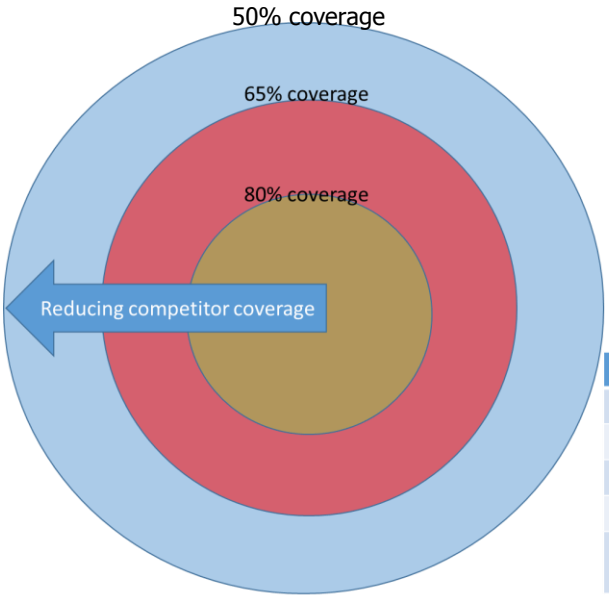
32. A casual inspection of Table A13.11 shows no consistency whatsoever to indicate that these fundamentally important modelling assumptions actually have these effects. The fact that the outcomes of service shares are largely random does not show the robustness of the methodology but rather the precise opposite namely that the use of postal sectors with coverage and buffer distances along with likely flawed connections data together leads to failure to find proper geographic markets.

33. One example will suffice to demonstrate this: Figure 1 below shows the impact of changing the coverage threshold shown as a series of concentric additive circles or 'doughnuts'. The closer to the centre the more competitive and the lower Openreach share should be.

[172] See the comments by Basalisco, Cadman and Osbourne in the 2016 Appeal JER on the Geographic Market [3 'Number of OCPs in the Boundary Test thresholds (e)] on bespoke pricing and competitor knowledge in this marketplace.

Figure 1

Coverage threshold and postal sectors schematic



- *Increasing coverage threshold means fewer postcode sectors meet the threshold*
- *If more businesses are covered, the expectation is competition is greater, so OR share would be lower*
- *With the share data in A13.11 (c2017 connections) and A13.5 (total number of new connections) we can work out the OR shares in each doughnut*
- *Many areas OR share is lower in the marginal areas than it is in the most competitive*

City	50-65%	65%-80%	>80%
Manchester	75%	55%	72%
Bristol	52%	42%	64%
Liverpool	65%	52%	77%
Nottingham	39%	42%	61%
London ex CLA	67%	69%	75%

34. With the share data in Table A13.11 and the number of new connections in Table A13.5, it is possible to work out the implied Openreach shares in the marginal postal sectors in Figure 1 above. Table 1 below shows that in many CBDs, the Openreach service share in the marginal areas is actually lower than in the most competitive sectors and generally there is no consistency at all here. The same will likely be the case flexing the buffer distance. This indicates that the geographic boundaries are incorrect, as they should distinguish neighbouring areas where competitive conditions are different.

Table 1

Implied Openreach service shares in marginal postal sectors
Marginal postal sectors

City	50-65%	65-80%	>80%
Manchester	75%	55%	72%
Bristol	52%	42%	64%
Liverpool	65%	52%	77%
Nottingham	39%	42%	61%
London ex CLA	67%	69%	75%

(iii) Bespoke pricing

35. That there are sunk costs of expanding a network does not in itself mean there is not a real competitive threat; what matters is the prior assessment of competition *ex post* entry.[173] Ofcom[174] makes an assumption that an SMP operator can exploit market power through localised bespoke pricing i.e. price discrimination. In fact for most EAD services this would not be realistic as the costs of doing this would likely exceed the benefits and in any case it would not always be the case that there was clear knowledge of the financial benefits of doing this.

36. Where Ofcom does find evidence of variation in pricing for the higher bandwidth services[175] this is then discounted as not being 'conclusive evidence', which seems inconsistent.

Economies of scale and scope, barriers to entry and countervailing buyer power

37. Openreach would concur with the general points made here but then would emphasise that Virgin Media can likely acquire the same benefits of economies of scale and sunk costs on its network. Indeed we note that Ofcom itself describes Virgin Media as having an 'incumbency advantage'.[176]

38. That there are potentially barriers to entry on the supply-side is in itself a reason why Ofcom's single product market relying on supply-side switching for off-net connections is wrong. The CMA Merger Assessment Guidelines put this as follows:[177]

'5.4.17 A firm is more likely to provide a constraint as a perceived potential competitor if its entry can take place without incurring any substantial sunk costs, and if it can happen within a year, though the Authorities' assessment in any case will take account of the particular aspects of the market in question.'

39. Where countervailing buyer power is highly relevant is in the backhaul sectors including in particular at the BT +1 exchanges and in areas of HNR for large value contracts. Openreach considers that the large LLU CPs also have a high degree of countervailing buyer power in addition to the MNOs.

III. BT HAVING SMP IN BT ONLY AND BT+1 AREAS

Very high market share of 2017 connections

Limited presence of rival infrastructure

40. A finding of SMP where BT (Openreach) is the only viable infrastructure provider is axiomatic. However these areas have been calibrated using a database which will wrongly class many areas into these categories whilst lowering their presence in the true BT +1 areas. (It is very likely this chain of errors will continue from BT+1 to BT+2.)

41. The proportion of businesses within 50m reach in Table 6.3 will inevitably be too low from the multiple errors introduced from: the inappropriate database of sites; the absence of MGA which suggests that the values

173 6.39 BCMR 2019 Consultation

174 6.32 BCMR 2019 Consultation

175 A14.40-42 BCMR 2019 Consultation

176 6.54 BCMR 2019 Consultation

177 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284449/OFT1254.pdf

from Annex 10 are more relevant; the use of fibre flexibility points for some CPs; and postcode accuracy as discussed in the Annexes to this response. Even so, based on these assumptions, there are of the order of 11 thousand sites which are within reach of at least 2 CPs in the BT+1 areas. The true number of sites within economic reach will be very much higher.

42. Openreach does not, therefore, consider that Ofcom has correctly set the geographic areas, particularly for BT+1 areas.

43. Openreach does not share Ofcom's assessment that rivals always need to dig very long distances.[178] The 63m and 350m in Table 6.3 are calculated mean average values, which may be distorted due to the presence of a small number of outliers, and the former is not significantly different from the 50m benchmark standard. As can be seen in the parallel assessment of BT exchanges, where it is known as a fact that CPs are present in an exchange, the average distance from a CP network in those BT+2 exchanges is in fact calculated at 62m (excluding an outlier) despite the true value being zero as the second CP is already present in the BT exchange.[179]

44. The relevance of the lower part of Tables 6.3 and Table 6.6 which show the breakdown of new customer ends for 2017 in terms of on-net and off-net proportions say nothing about the propensity to dig under MGA. The build-buy ratio is greatly affected by the initial on-net duct connected circuits and this is also seen in the HNR areas.

45. Additionally, these figures are based on the CP that won the contract to supply and do not provide evidence of how many other CPs were willing to supply that site.

46. Openreach do not agree that the evidence shows that within the Virgin Media footprint that Openreach still enjoys a competitive advantage.[180] We believe that where Virgin Media and Openreach have comparable networks the competition will both be intense and equally matched. That Virgin Media has chosen to purchase off-net from Openreach will partly reflect the regulation that Ofcom has imposed, where active product prices have been driven so low they reduce the incentive to invest in new network.

Economies of scale and scope

47. It is likely that within its footprint, Virgin Media can acquire the same economies of scale and scope as Openreach. In fact it also has advantages of vertical integration, as do some other competitors. References though to Openreach's share in the WLA market seem irrelevant within a MGA, but would also be an economy of scale and scope shared by Virgin.

Barriers to entry and expansion

48. The results of the BDRC survey[181] do not in fact indicate that there are intrinsic difficulties in switching and indeed if anything indicate that the barriers are not insurmountable or give Openreach a particularly large advantage. However given comments made when this data has been used previously, we would not put much reliance on it.[182]

178 6.51 BCMR 2019 consultation

179 Table A12.19 BCMR 2019 Consultation

180 6.54 BCMR 2019 Consultation

181 6.63 BCMR 2019 Consultation

182 JER para 60

BT network coverage

Other advantages

49. Ofcom speculates that end customers place advantage on single infrastructure provider.[183] In practice it is likely that many end customers will not necessarily even know who has provided the access circuits and to the extent this is a disadvantage it has not hindered Virgin Media from purchasing off-net from Openreach.

50. We do not see the advantage of resilience as significant or favouring Openreach.[184] Other providers (COLT, Cityfibre) would argue their ring design provides greater resilience than Openreach's and many end customers prefer to dual source for full resilience.

Absence of potential competition

51. Openreach has not had sight of this information and so cannot meaningfully comment here.

Countervailing buyer power

52. There will be many informed purchasers in BT +1 areas well capable of trading off BT against another supplier particularly if the site is high value.

Overall conclusion

53. Openreach accepts a designation of SMP in BT Only Areas and BT+1 areas, but believe that Ofcom should refine their analysis to improve the accuracy of how locations are classified.

IV. SMP IN EACH METRO AREA AND IN HNR AREAS IN THE REST OF UK

Presence of rival infrastructure

54. Openreach disagrees with the findings here, and even more so given the flaws in the analysis that lead to the findings. Inspection of Ofcom's Table 6.6 indicates the following:

    - Over half of sites are within 50m of two rival networks for Metro Combined areas;
    - The average distance to even the second rival network is close to the 50m benchmark in Bristol, Birmingham, Glasgow, Leeds and Manchester and Rest of UK at 52m.

55. Based on the level of competition and dig distances, the conclusion of SMP for Openreach is ambiguous. Ofcom relies on service shares based on the 2017 connections data. Here Openreach's reported share is 'over 50%' (the actual shares in Figure 6.5 are redacted) with the next largest, presumably Virgin Media, being 'less than 40%'.[185] The metro areas[186] have between 230 and 443 connections in 2017[187] which is a small sample to base conclusions on, particularly if it may not be accurate.

56. There are a total of 10,164 circuit connections with missing or invalid postcode information (all CPs).[188] Any slight biasing of the records could have a significant impact on the shares in a particular metro area. Although most of Virgin Media's coverage in the UK is based around their initial hybrid fibre/coax network, it has also

183 6.66 BCMR 2019 Consultation

184 6.69 BCMR 2019 Consultation

185 As set out at paragraph 15 in this Annex, Openreach notes that due to backlog issues in 2017, these shares are materially overstated

186 Table A12.15 BCMR 2019 Consultation

187 A12.15 BCMR 2019 Consultation

188 Table A12.4 BCMR 2019 Consultation

built point-to-point fibre networks in city centres and it would not be at all unrealistic to believe the large quantity of missing data is biased either for or against these differently served areas.

57. As with Table 6.3, Openreach considers little if any insight is acquired from the statistics in the lower half of Table 6.6 which concern on-net and off-net proportions. The ratio of build/buy is primarily affected by the proportion of the initial on-net connections which just reflects the scope of the existing networks.

58. Openreach fundamentally disagrees with Ofcom's conclusions regarding the six Metro Areas.[189] Specifically with regard to the arguments advance for Manchester[190] which do not follow a MGA assessment:

- Simply stating that CPs 'may not always be willing to dig to a site' says nothing about underlying incentives and Ofcom has not provided any evidence on true limitations to dig with only some evidence of actual digs being less than this in practice and which is not the relevant benchmark for potential competition.
- The average number of connections in 2017 which are on-net has likewise no direct relevance to potential competition.
- That on average rivals choose to use BT for off-net is not an MGA framework and driven by regulation on active services.

59. We do not consider it significant or meaningful that 8% of customers in Manchester have less than two rivals within 50m, and if it was, then arguably the 12% of businesses within reach of four rivals in the Metro combined area should indicate they have widespread choice.

60. Aside from Ofcom's analysis here we think it is relevant to consider the opinion of network providers in these locations, and their experience of competition, such as Gamma's experience of competition in Manchester discussed in the CAT appeal[191] and their view that infrastructure competition would be possible elsewhere.

61. Openreach does not agree with Ofcom's finding of SMP in HNR areas in rest of UK and each of the Metro Areas, and considers these areas should likely be deregulated. It would be necessary for Openreach to have full sight of the material redacted in Annex 13 to offer more definitive comments.

V. PROPOSAL TO FIND NO SMP IN CLA

62. Whilst Openreach agrees with this conclusion, we have concerns on the completeness of the competitive geography. First, it is not clear why a geographic area based on the Boundary Test is used at all, as this is not explained and in using analysis from a previous BCMR is not consistent with the analysis here.

63. In practice, Ofcom deregulates here in spite of the fact that supposedly Openreach has as high service shares in the CLA on 2017 connections as outside the CLA. This deregulation is in fact based on infrastructure presence as recorded in Table 6.9. We believe Ofcom should be consistent in approach and also conclude no SMP on the HNR areas and Metros.

189 6.88 BCMR 2019 Consultation

190 6.90 BCMR 2019 Consultation

191 Paras 379 and 390 of the Judgement. Paras 381 and 431-432 are also relevant for discussion on competition.

64. It is also relevant to note that in the 2016 Statement[192] Ofcom quoted BT shares of up to 1G and VHB at 47% and 12% respectively in CLA. It seems implausible that the BT share has risen since to 61-70% (all bandwidths) and 31-40% for VHB.[193] The current shares are based using 2017 connections, which further indicates that in using 2017 connections for service shares, Ofcom is overstating Openreach's market share. We believe this is true across all markets.

[192] Table A5.1 and Table A5.2, 2016 BCMR statement

[193] Table 14.2 BCMR 2019 Consultation

Annex G:
Comments on Ofcom's Annex 14 on Very High Bandwidth services

I. SUMMARY

1. As well as considering the overall assessment on SMP for CI services, we have separately considered Very High Bandwidth (VHB) (as analysed in Annex 14) which we believe supports that there should be a bandwidth break above 1G. This is based on the following issues with the analysis that we have identified:

   - The data underpinning the service shares in the various geographic markets and the willingness to supply a VHB service which feature in the SMP analysis have serious shortcomings for all CI services, which will all be magnified for VHB services in access.
   - The fact that BT has national coverage does not detract that for very large areas there will likely be effective competition as infrastructure providers will target their networks for these sites which have higher revenue and justify extending further their own networks. Due to the higher value opportunity on VHB, the competitive areas for VHB will not be the same as for lower bandwidth CI services.
   - The pricing and margins on VHB for Openreach do not support Ofcom's conclusion of SMP (for the reasons set out in Annex D of this response).

2. The general shortcomings of the SMP assessment in Section 6 of the Consultation are even more acute in VHB as explained below. Openreach does not consider Ofcom has demonstrated BT has SMP in VHB provision in access except perhaps in very few geographic areas, but we believe there is no evidence of market power issues which would justify *ex ante* regulation. Ofcom did not regulate VHB services in 2017 and if no competition problems have arisen, then there is no obvious basis now for *ex ante* regulation.

II. MARKET CONTEXT

VHB in Access

3. We agree that only a very small proportion of VHB circuits are used in Access[194] and that they will remain a low proportion of total VHB.[195]

4. Ofcom is incorrect in stating[196] that there is supply-side evidence for a single product market for reasons set out in Annex C on the Product market. What Ofcom calls supply-side entry is not in fact part of the Hypothetical Monopolist Test (HMT) or Small but Significant Non-transitory Increase in Price (SSNIP) process. The comparative prices for 10G versus 1G to be used for a SSNIP test are far apart[197] and if a 10G service is needed for the end-user then backhaul capacity is also needed which would also generate an increment in network capacity and associated costs (including new equipment costs) which form a material portion of an overall cost of circuit provision. Even without considering the costs of switching bandwidth Ofcom themselves conclude the SSNIP test result between 1G and 10G is ambiguous.[198]

5. The need for bandwidth is the main driver of demand for 10G services, which would limit the volumes that would switch as a result of a SSNIP in practice.

Product dynamics

6. Ofcom acknowledges the issue of product lifecycle and early adopters.[199] This is central to the pricing and marketing of higher bandwidth services and impacts the analysis of the Product market and Ofcom's conclusions on the relationship between FAC and competitive price levels at any particular point in time.

7. We disagree that 10G or multiples of 10G will be the norm for MNOs within the next 3-5 years. We agree this market is going through a lot of change, but the exact demands are unclear, as they change regularly, and differ from MNO to MNO. [200] [redacted]

8. It is agreed that some enterprises will request 100G but these will typically be datacentres or other specialised data processing businesses not large enterprises in general. In this sense, 100G will become the equivalent of 10G in due course and the lifecycle aspects of demand and pricing will continue just as has happened to date with 10M, 100M, 1G and 10G.

9. Ofcom suggests[201] that the bandwidth gradient is flattening but this is a misleading statement as it only reflects the lifecycle of pricing these particular products. The flattening of the bandwidth gradient is clear at

194 A14.14-15 BCMR 2019 consultation

195 We note that this assessment is very different to the high migration hypothesis advanced by Ofcom in the 2016 Statement Annex 5 and the 2016 Appeal.

196 A14.1 BCMR 2019 consultation

197 As shown in Ofcom's figure A8.6

198 4.32 BCMR 2019 consultation

199 A14.18 BCMR 2019 Consultation

200 Information on MNO requirements has changed since Ofcom issued its original s135 requests and the general requirement is for 10G or even 1G.

201 A14.19 BCMR 2019 Consultation

100M to 1G and at a future point in time 1G is likely to become the entry level for a leased line, but above 1G a substantial gap remains in price.

10. Openreach has already commented on Ofcom's circularity hypothesis[202] above that it is unfounded, and Ofcom must show that extant prices are above the competitive levels with convincing evidence such as with reference to DSACs.[203]

11. On the one hand Ofcom[204] claims BT's VHB prices are too high which suggests observed service shares are too low and understate market power, but then Ofcom[205] also argues that BT introduced more competitive pricing back in 2015 and as a consequence BT has higher service shares of new connections which also indicates market power. Ofcom[206] also appears to believe that Openreach's Optical Filter Connect product is unreasonably deterring entry. It would seem that on either basis, whether prices are too high or set at a competitive level - that Openreach will be attributed with market power.[207]

12. Ofcom does not appear to have considered the counterfactual that BT had set the 10G price to be competitive, as the CAT concluded.[208] We also note the change in argument from Ofcom, when previously it was not suggested that BT's 10G pricing was distorting the analysis of the bandwidth break in the 2016 Appeal.

III. ASSESSMENT OF SMP CRITERIA

Service shares

13. The concerns expressed in Annex E on the use of 2017 connections data and as a forward look apply with particular force for VHB; many circuits will have been tendered in previous years as part of contracts which are renewed on an infrequent basis, with contracts of five years or more not unusual at a retail level. There is no reason to suppose the volumes or service shares will be stable in any year or any guide to future years as Ofcom speculates,[209] either in access or in backhaul. There is no basis at all for Ofcom's assertion[210] of competitive dynamics and the use of connections data; no such evidence can be adduced from the past in this sector or any other market review. We do not agree that using a single year of connection data is an appropriate way to assess share.

14. Ofcom's own analysis in Annex 10 shows that the incentives to extend networks increase with value of site and the length of the contract. The VHB sites are very likely to endure for the longer term in fact. This suggests that the identification of geographic areas will be more affected by errors of the buffer distance, the use of the database with irrelevant sites and the inaccuracy of the 50m standard. This is in fact confirmed by Table A14.2 which has consistently lower shares for VHB ends compared with all CI bandwidths (for Other

202 A14.20 BCMR 2019 Consultation

203 See the comment on pricing by Ofcom's Chief Economist Mr Peter Culham in the Colt Appeal in his First Witness Statement 2 August paragraph 20 where he accepted that the pricing problem of leased lines was primarily one 'to a very significant extent' - of determining common cost recovery.

204 A14.20 BCMR 2019 Consultation

205 A14.24 BCMR 2019 Consultation

206 A14.25 BCMR 2019 Consultation

207 This illustrates, as discussed earlier, that this is not cellophane fallacy.

208 Para 210 of the Judgment

209 A14.26 BCMR 2019 Consultation

210 A14.31 BCMR 2019 Consultation

HMR areas the ranges are the same and the volume of circuits in HNR Areas outside CLA are very small in any case). What is most striking is in fact the BT Only sectors where the ranges are 20% points lower.

15. The fact that service shares in geographic markets are broadly similar[211] merely reflects the fact that there is so much error in calibration that the results are averaged out across all postal sectors, irrespective of whether there is rival infrastructure close to these customers or not. The geographic markets for all CI services have no relevance for VHB services in any case.

16. Ofcom acknowledges the flaws in the inventory data, saying "we consider the inventory service shares for VHB access are highly unreliable",[212] but then makes extensive reference to the numbers. The BT service shares using the inventory data[213] are in fact dramatically lower than for 2017 connections. As Ofcom notes,[214] data for 32,243 circuits have been provided with missing bandwidth information across all operators and a significant proportion of which are Virgin Media circuits. As the volume of VHB circuit ends presented in the service share analysis is 9,138[215] and this is actually lower than the total of 10,109 circuits presented earlier,[216] we believe Ofcom has not taken into account any of these missing bandwidth circuits from Virgin Media, and thus is potentially over-estimating BT's service share.

17. Part of Ofcom's rationale for using 2017 connections in its service share analysis is that this data should give a better indication of future market share than existing inventory, given that Openreach has recently reduced prices and launched new variants. As explained above these have been launched to be competitive at current market rates, which doesn't suggest that Openreach will suddenly reverse from its second place position, merely that it will now hold steady in the market. It also does not take into account that competitors will (and have already) responded to these changes with lower prices and new products of their own in order to maintain their market shares seen in the inventory table.

18. It is highly relevant however to consider the impact of dark fibre on both sets of data although Ofcom only presents it for 2017 connections in Table A14.6. Some dark fibre VHB usage will be for one circuit but the average will be greater than one so the service ranges presented on that basis in this Table are misleading. In fact, the average usage could well be greater than two and the shares then would be lower than computed, although it is impossible to say if any of the ranges would change.

Prices and margins

19. As noted above, that Ofcom finds Openreach's VHB prices to be still 'substantially above BT's costs'[217] is predicated on a particular presumption on cost allocation and how prices for these services should be set in relation to those costs. There is no basis for this to form any presumption of market power whatsoever and indeed Ofcom's own acceptance of the lifecycle of these services is at odds with this position.

211 Footnote 215 BCMR 2019 Consultation

212 A14.32 BCMR 2019 Consultation

213 Table A14.3 BCMR 2019 Consultation

214 A12.57 BCMR 2019 Consultation

215 Table A14.3 BCMR 2019 Consultation

216 A12.57 BCMR 2019 Consultation

217 A14.34 BCMR 2019 consultation

20. Ofcom repeats[218] the migration hypothesis of VHB services without any evidence and this was largely rejected by the CAT as lacking in any evidence as quoted above in Annex E in response to Section 4.

21. Ofcom states[219] 'the internal pricing documents suggest that the reason for the price reductions in part indicate BT faced competition for VHB circuits' but that this 'does not contradict a finding of BT having market power. The relevant paper itself[220] proposes a price reduction on VHB services to be approved to come into effect in April 2018 ahead of the launch of OFC as Openreach was facing such a significant threat from competition that a reaction could not be delayed. The paper itself states - 'We are no longer competitive in the VHB market and at risk of losing significant business if we do not make these changes' quoting that £26m of annual revenue was at risk. This indicates the opposite conclusion to the one Ofcom is drawing, rather than having market dominance Openreach is trying to keep up with market leaders.

Conclusions

22. There is very limited evidence for attributing Openreach with SMP in VHB access with Ofcom acknowledging in Section 4 that their tests are ambiguous, so reliance is placed solely on the basis of service shares for one year which there is no reason to believe will be indicative of future demand.

23. Openreach can see no basis for *ex ante* regulation in this marketplace. Use of VHB for access is very limited and will remain so for some time with most use of 10G or 100G being specialist organisations generally able to tender for provision. Openreach would not know whether or not it faced competition for most access VHB circuits and even where it did, there would be no real incentive to exploit market power as the transaction costs would be high.

24. The evidence adduced by Ofcom for all of the Access geographic areas does not demonstrate market power and there are plenty of other rival infrastructure providers willing to offer service as was testified at the CAT in the 2016 Appeal.

218 A14.46 BCMR 2019 consultation

219 A14.36-7 BCMR 2019 Consultation

220 Document entitled "New pricing and product launches for VHB portfolio"

Annex H:
Cross-reference between Ofcom's questions and sections of our response

Please note that this response does not include answers to the following questions:

- Question 8.1 relating to Traditional Interface services: this question is not relevant to Openreach;
- Questions 9.1 to 9.3 relating to the Hull Area: these questions are not relevant to Openreach;
- Question 15.1 relating to Quality of Service remedies: our answer to this question is set out in our separate response to Question 15.1
- Question 16.1 relating to remedies in the Hull Area: this question is not relevant to Openreach; and
- Ofcom's questions on the Leased Lines Charge Control: our answers to these questions are covered in our separate, parallel response to Volume 2 of the Consultation.

Contemporary Interface (CI) Access

Question	Response section(s)
Question 4.1: Do you agree with our proposed approach to product market definition? Please provide evidence to support your views.	Section 3, Annex D
Question 4.2: Do you agree with our proposed CI Access product market definition? Please provide evidence to support your views.	Section 3, Annex D
Question 5.1: Do you agree with our proposed approach to geographic market analysis for CI Access? Please provide evidence to support your views.	Section 3, Annex E
Question 5.2: Do you agree with our proposed definition of geographic markets for CI Access? Please provide evidence to support your views.	Section 3, Annex E
Question 6.1: Do you agree with our proposed approach to SMP assessment for CI Access in the UK excluding the Hull Area? Please provide evidence to support your views.	Section 3, Annex F, Annex G
Question 6.2: Do you agree with our proposed SMP findings for CI Access in each of the geographic markets defined? Please provide evidence to support your views.	Section 3, Annex E, Annex G

CI Inter-exchange connectivity

Question	Response section(s)
Question 7.1: Do you agree with our assessment of inter-exchange connectivity? Please provide evidence to support your views.	Section 2, Annex A
Question 7.2: Do you agree with the proposed market definition? Please provide evidence to support your views.	Section 2, Annex A
Question 7.3: Do you consider that our list of BT exchanges for de-regulation is correct? Please provide evidence to support your views.	Section 2, Annex A
Question 7.4: Do you agree with our list of Principal Core Operators (PCOs)? Please provide evidence to support your views.	We have not made specific comments on this issue

Approach to remedies

Question	Response section(s)
Question 10.1: Do you agree with our proposed approach to remedies? Please provide reasons and evidence in support of your views.	Section 4

General remedies

Question	Response section(s)
Question 11.1: Do you agree with the general remedies that we propose? Please provide reasons and evidence in support of your views.	Section 4

Specific dark fibre remedy for inter-exchange connectivity

Question	Response section(s)
Question 12.1: Do you agree with the aims and effect of our proposed dark fibre remedy? Please provide evidence to support your views.	Section 2, Annex B
Question 12.2: Do you agree with our proposed scope of the remedy? Please provide evidence to support your views. Please provide evidence to support your views.	Section 2, Annex B
Question 12.3: What scope do you expect to have for cost savings as a result of the proposed dark fibre remedy? How large do you expect any cost savings to be? Please provide evidence to support your views.	Section 2, Annex B
Question 12.4: How many orders for dark fibre would you envisage placing during the two-year review period? Please provide evidence to support your views.	This question is not applicable to Openreach
Question 12.5: Do you agree with our proposed timeline for dark fibre implementation? Please provide evidence to support your views.	Section 2, Annex C

Specific remedies for active services

Question	Response section(s)
Question 13.1: Do you agree with the specific network access remedies that we propose for CI services at all bandwidths in the business connectivity markets? Please provide evidence to support your views.	Section 4

Specific remedies for interconnection and accommodation

Question	Response section(s)
Question 14.1: Do you agree with the specific remedies for interconnection and accommodation that we propose? Please provide evidence to support your views.	Openreach has not commented on these remedies