Three's response to Ofcom's Wholesale Fixed Telecoms Market Review 2021-2026.

Non-Confidential

22 May 2020

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Executive Summary

Three supports Ofcom's overall strategy of opening up potentially competitive areas of the UK to new fibre networks. Now is the time to commit to this strategy and promote a diversity of fibre networks for both fixed broadband and mobile services.

Ofcom's historic approach has been to tightly regulate access to Openreach's network wherever it has market power. Although this has successfully promoted retail competition in mobile and residential broadband (i.e. by allowing BT's rivals affordable access to wholesale LLU and leased lines), cost-based access regulation has also cemented the UK's dependence on Openreach.

The old model of regulation has restricted the flow of new fibre investment in the UK by imposing a low ceiling on the returns that investors can make from funding these networks. Faced with little competition from rival networks, BT's shareholders have been able to dictate the pace and extent of investment in the UK's critical national infrastructure – most notably, by delaying investment in full fibre and refusing to supply the dark fibre circuits which are now needed for 5G.

By relaxing price regulation in areas where commercial fibre build is feasible and allowing unrestricted access to Openreach's ducts and poles, Ofcom is giving fibre networks the incentives to enter new areas and compete with Openreach where viable. There will remain however large areas of the UK where competitive entry remains uncommercial and where Ofcom's proposed cost-based dark fibre remedy will be needed.

Our view is that one of the key aims of Ofcom's strategy must be to ensure ubiquitous dark fibre availability to enable 5G, either commercially (in competitive and potentially competitive areas) or through the imposition of dark fibre access regulation elsewhere. With sufficient accuracy in its geographic analysis, Ofcom's strategy should ensure this.

However, Ofcom must balance the aim of promoting investment in new fibre networks in more competitive areas against its duty to protect access seekers in non-competitive areas. Our analysis shows that Ofcom has over-estimated the scale of competing fibre providers' deployments over the next five years.

As a result, Three may be left with no choice but to purchase loosely regulated leased lines from Openreach (instead of dark fibre) for [✂]. This is inconsistent with the objective of protecting access seekers in non-competitive areas and an outcome where there is ubiquitous dark fibre availability for 5G.

We ask that Ofcom defines a further geographic area including locations with more speculative fibre deployment plans and where fibre providers do not plan to offer dark fibre for mobile access. Ofcom should impose a dark fibre access remedy on Openreach in this area with a looser price cap, which retains investment incentives while also protecting access seekers.

We have two further asks of Ofcom in non-competitive areas:

- Firstly, Ofcom proposes dark fibre access rental prices which are [✂]. Ofcom should revisit the cap to ensure it truly reflects Openreach's efficiently incurred costs;

- Secondly, we ask that Ofcom continues to impose a cost-based price cap on Ethernet services in non-competitive areas. Although our strategy is to prioritise dark fibre over other options, we will need to purchase many managed leased lines services in rural areas. These services use regulated Openreach Ethernet products, the prices of which will be maintained significantly above cost.

We strongly support cost-based regulated access to Openreach's ducts and poles to reduce the costs of competitive network build. However, Ofcom's non-discrimination requirement has failed to create a level playing field. We have identified issues which could slow or even prevent efficient deployments by non-BT providers and have suggested appropriate remedies. If Ofcom cannot rectify these issues, it should consider imposing a strict Equivalence of Inputs requirement on Openreach.

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1. We support Ofcom's aim of incentivising widespread investment in fibre for both mobile and home broadband.

1. Executive summary

1.1. Reducing the UK's dependence on Openreach is a national priority. Cost-based regulated access to BT's network has proven effective in promoting retail competition in home broadband and mobile, but it has also cemented BT's market power in the access network and has done little to improve its performance.

1.2. Without strong competition from rival networks, BT decided to 'sweat' its copper network (rather than invest in full fibre) and not to supply dark fibre connections which are now critically needed for 5G. The UK is now suffering the consequences, with relatively few households connected to full fibre and dark fibre being unavailable in most of the country.

1.3. We welcome Ofcom's strategy to reduce reliance on Openreach's network and promote network competition. The UK needs a diversity of fibre networks. BT's shareholders should no longer be able to dictate the extent and pace of fibre investment in the UK. We favour regulation that incentivises new providers to rollout fibre where possible and protects access seekers (through continued cost-based regulation) where network competition does not prove to be viable.

1.4. In our view, one of the key aims for this market review is to ensure ubiquitous dark fibre availability for 5G (either on a commercial basis or through regulation). This can best be achieved by ensuring that unrestricted access to BT's pole and ducts network meets the needs of the industry, and also by tailoring regulation to the level of network competition in different parts of the country (as Ofcom proposes).

1.5. With some modifications, Three believes that Ofcom's proposals can help deliver the next generation of digital infrastructure throughout the UK. In the residential market, Ofcom's proposals will underpin Government's ambition to deliver 'gigabit-capable broadband' to all UK households by 2025. In the business market, the new strategy can help improve the availability of dark fibre (either commercially or through regulation) to support 5G rollouts and meet the expected surge in mobile traffic.

2. Reducing the UK's dependence on BT Openreach is now a national priority

2.1. Until its 2016 Strategic Review of Digital Communications, Ofcom's approach to fixed network regulation aimed to promote cost-based regulated wholesale access to BT's fixed access network. This recognised that BT's access layer – the connection between residential/business premises and MNO sites to a point of aggregation accessible by other operators – is an economic bottleneck in large parts of the country that no other operator can profitably replicate.

2.2. The sources of this bottleneck are chiefly:

- **Substantial sunk costs** of building a competing network. These include the costs of digging ducts and laying infrastructure, which cannot be moved to other locations if no longer required at the original site.[1] Unlike new entrants, BT has already incurred these sunk costs in most of the country, which raises significant barriers to entry. Ofcom has recognised the scale of these costs in its SMP analyses across multiple market reviews.[2]

- **BT's superior reach and cost advantage.** BT has a higher density of connections than rivals in most of the country. Its legacy copper network covers almost all UK households (outside the Hull area) and its fibre network reaches most business premises and MNO sites, including those served by other providers. BT has a significant unit cost advantage when it is connected to customer premises and rivals are not.

2.3. This 'essential facility' confers monopoly power on BT, allowing it to behave to an appreciable extent independently of competitors, customers and ultimately consumers – basically, a position of dominance. The prevailing view has been that having two or more suppliers connecting to customer premises would be uneconomic in much of the country – and probably wasteful, since doing so would duplicate facilities unnecessarily.

2.4. Furthermore, the traditional view has been that a multiplicity of suppliers could not long survive outside the most profitable urban areas – certainly, this was the experience with market entry by local cable operators in the early 1990's. Operation of the local loop and the provision of access to it have traditionally been considered a natural monopoly calling for the usual restraints on monopoly power. Ofcom's strategy was to ensure BT provided regulated wholesale access to its fixed access network (Openreach) and did not exploit its wholesale customers.

2.5. This section explains that reducing the UK's dependence on Openreach is now a national priority. Despite significant achievements, cost-based access regulation has perpetuated BT's market power, allowing it to dictate the pace of fibre investment in the residential market and the availability of dark fibre in the business segment.

Cost-based regulated access charges have made entry into the fibre market unprofitable and perpetuated the UK's dependence on BT Openreach

2.6. Wholesale access regulation aims to deliver a competitive telecoms market at the retail level when the underlying upstream infrastructure is owned by a single provider (Openreach) in many parts of the country. Operators accessing Openreach's network pay wholesale charges to Openreach, subject to charge controls set by Ofcom.

2.7. This regulatory framework has been very successful in promoting competition in residential home broadband. The availability of cost-based wholesale regulated access products (particularly Local Loop Unbundling and later Virtual Unbundled Local Access) has lowered the costs of entry and enabled the emergence of scale competitors to BT at the retail level. Sky, Vodafone and TalkTalk have all used these products to connect to BT local exchanges, installing their own equipment

[1] Virgin Media has been the only provider to offer (limited) competition to Openreach. This is because it uses the UK's pre-existing cable network to provide a service, significantly reducing its fixed deployment costs.
[2] For example, Ofcom found there to be high and non-transitory barriers to entering the physical infrastructure market in its 2019 PIMR Statement (paragraph 3.129) and its 2018 WLA Statement (Volume 1, paragraphs 4.56-4.62).

and serving millions of UK households without having to build duplicate access networks.

2.8. In the business market, cost-based regulated access to Openreach's active EAD lines has given businesses and MNOs an access solution (for MNOs, largely through BT Wholesale's MEAS service but in some cases directly through Openreach). This avoids the costs of building a parallel access network to connect BT exchanges to thousands of businesses and mobile sites scattered throughout the country.

2.9. At the same time, however, the UK experience shows that access-based regulation will not replicate the benefits of network-based competition in fixed access. Cost-based access regulation has perpetuated the UK's dependence on Openreach and has done little to improve its performance.

2.10. In particular, the model has not been successful in incentivising new fibre rollout, even if (at similar scale) new fibre networks might be more efficient than BT's older legacy network. Regulated cost-based wholesale access charges may have restricted the flow of fibre investments in the UK. Ofcom has consistently found BT to have significant market power in both residential and business markets.

2.11. This suggests that cost-based access regulation may have left insufficient headroom for new fibre players to enter or expand in the market, except for very specific segments in the most profitable parts of the country. Operators like Colt, Level 3, CityFibre and Zayo have traditionally targeted large business districts (e.g. central London) or specific towns, cities or trunk routes connecting large cities.

2.12. The record suggests that new providers have been unable to match BT's scale and scope economies (outside very specific areas of the country) at prevailing cost-based regulated prices:

- **On the revenue side**, Ofcom's charge controls effectively set a ceiling on what potential networks can charge in competition with BT – in our experience, new entrants must offer significant discounts to persuade customers to switch away from BT. New entrants can be discouraged by the threat of low-cost competition by BT (in the form of volume discounts) if they enter or expand in the market;

- **On the cost side**, new fibre providers – initially built to supply only part of the available demand in each market area – will face significantly higher unit costs than BT in the short term, until they reach a critical mass of customers connected to the network. Having an 'anchor tenant' with access to large numbers of consumers (e.g. an MNO or a large broadband provider like Sky or TalkTalk) can determine the profitability of the investment in an area.

2.13. We note the assessment of the Competition and Markets Authority (in the context of CityFibre's appeal of Ofcom's 2016 BCMR Decision) that CityFibre had identified "*a credible case*" about the negative impact of the leased lines charge control set by Ofcom on new fibre investment.[3]

2.14. If anything, cost-based access regulation may have tilted operators' 'build or buy' decisions in favour of seeking access to BT's network. With insufficient margin in the regulated access products to provide build incentives, operators traditionally

[3] BCMR CMA Final Determination 2017, paragraphs 3.80-3.81.

preferred regulated wholesale access to BT's network, further entrenching Openreach's position as the monopoly provider.

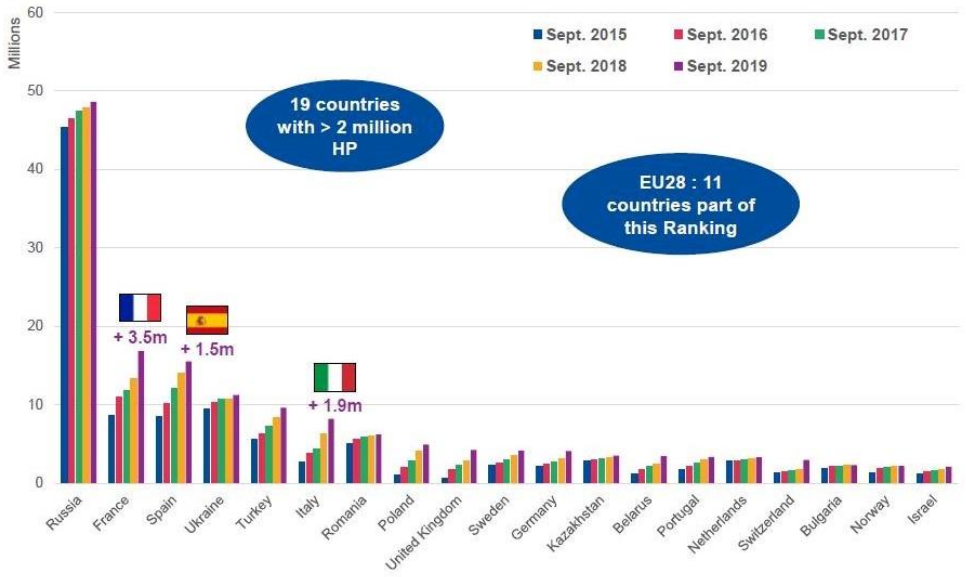
2.15. Without strong competition from rival networks, key investment decisions concerning the UK's critical national infrastructure have been left to BT, even if its commercial aims are not always aligned with the general interest of the country. The UK is now grappling with the impact of these decisions on the competitiveness of the UK's economy.

In the residential market, BT prioritised copper and delayed investment in full fibre

2.16. The UK has committed to a full-fibre future. Government's initial ambition was for UK operators to pass 15 million premises with Fibre to the Premises / Homes (FTTP / FTTH) networks by 2025, with an aspiration to deliver nationwide full fibre by 2033. Government has now set a new target of 'gigabit-capable' broadband to every home by the end of 2025. This can be delivered with FTTP, but also via Hybrid Fibre Coaxial cable (HFC Cable DOCSIS) and Fixed Wireless 5G networks.

2.17. Despite some recent progress, the UK is very far from that goal. Only about 3.6m UK households (10-12%) have access to full fibre broadband today. In 2010 BT decided to 'sweat' its copper assets by investing in Fibre to the Cabinet (FTTC), a part-fibre, part-copper technology. BT's decision to prioritise FTTC instead of FTTP has impeded the UK's progress to a fully competitive digital economy.

Figure 1: European ranking of Fibre to the Home (million premises passed), 2015-2019



Source: IDATE

2.18. By comparison, millions of households in Spain and France (77% and 38% respectively) are already enjoying the benefits of full fibre. These countries prioritised full fibre early on, rather than FTTC. Their experience shows that,

where economically viable, network competition in fixed access can drive fibre deployment.[4]

2.19. FTTC only takes the fibre connection from exchange to the street cabinet, leaving the old copper connection in place to carry data from cabinet to premise. FTTC is fast enough for most household uses today, but its limits will become apparent in the next few years as demand for data-intensive services increases. Average residential broadband speeds in the UK are growing steadily. Ofcom's figures show that the average download speed has increased from 29Mbit/s in 2015 to 54Mbit/s today.[5]

2.20. Ofcom forecasts that almost 20% of UK broadband connections will be capable of download speeds in excess of 300Mbit/s by the end of 2025.[6] As available speeds increase, so does consumer demand for faster speeds. Many consumers are already demanding greater speeds than can be provided by FTTC superfast broadband. Ofcom estimates that around 30% of consumers with access to a full fibre service currently choose to take it up.[7]

2.21. Full fibre is future-proofed and is cleaner, faster and more reliable than copper. Fibre optic cables running from the local exchange directly into customers' premises require no electrical charge and can carry much more data with faster speeds (over 1Gbps) and lower signal loss than copper cables. Full fibre has fewer operating faults, is cheaper to maintain and is less likely to slow down when many people connect to the network.

2.22. As the number of consumers demanding greater broadband speeds increases, so does the importance of full fibre deployments in the UK. We expect that full fibre speeds will be needed for mainstream broadband uses within the time horizon of current full fibre builds (i.e. 10 years). It is critically important that Ofcom's regulatory approach supports fibre deployments by competing infrastructure providers (in areas where doing so is commercially viable).

BT refuses to supply the dark fibre connections needed for 5G in the business market

2.23. The UK telecoms industry is also having to grapple with the impact of BT's market position on the availability of 'dark fibre' – i.e. unlit fibre optic cables that have not been connected to electronic equipment. Demand for dark fibre is growing rapidly as data centres, internet service providers, MNOs and large businesses have started to demand large volumes of higher capacity circuits.

2.24. Traditionally, the geographic availability of dark fibre has been constrained by the limited footprint of the few existing providers – City Fibre, EU Networks, Interoute, Level 3 and Zayo Group. The only operator with a ubiquitous fibre network in the UK – Openreach – will not supply dark fibre. BT's only competitor of scale (Virgin Media) was also reluctant and only initially provided it on a selective basis.

2.25. There is no better illustration of BT's ability to act independently of competitors, customers (and ultimately consumers) than its continued refusal to supply dark fibre to its own customers. BT does not want to erode its Ethernet business by selling inexpensive dark fibre capacity. Dark fibre prevents BT from upselling to higher capacity circuits every time operators need greater bandwidth (with fresh

[4] Future Telecoms Infrastructure Review Annex A, July 2018

[5] Ofcom Communications Market Report 2019

[6] Ofcom WFTMR Consultation 2020, Volume 2, Figure 2.4.

[7] Ofcom Connected Nations 2019, Figure 5.

connection fees and higher annual charges) and adding services to its raw fibre connectivity business.

2.26. Ofcom's 2016 Business Connectivity Market Review imposed a Dark Fibre Access (DFA) remedy on BT from October 2017:

- For 15 months, between April 2016 and July 2017, industry worked with BT in developing the technical and operational aspects of the dark fibre product. BT was ready and able to provide dark fibre.[8] Development costs had been covered and there was clear demand from its key customers;
- In December 2016, BT published a reference offer for dark fibre. This was meant to give operators (including MNOs) physical access to BT's unlit fibre optic cables, allowing them to install their own equipment at either end of BT's fibre (i.e. at the BT exchange and MNO site);
- However, BT successfully appealed this at the Competition Appeal Tribunal (CAT) in 2017. BT withdrew its dark fibre product following the appeal, even though operators like Vodafone, TalkTalk and SSE Telecoms had invested significant sums in systems and processes to use it;[9]
- Like Vodafone and O2, Three supported the DFA remedy to increase backhaul capacity at individual sites (to support the move to 4G and 5G) and end the perpetual cycle of backhaul costs increasing with bandwidth requirements. The loss of the DFA remedy was a significant blow because we had built our transmission strategy around the expected availability of regulated BT dark fibre.

2.27. Lack of availability of dark fibre poses a key problem for the mobile industry. 5G needs high capacity fixed lines connecting individual sites to BT exchanges and data centres. Three is upgrading thousands of lines to dark fibre to meet explosive growth in mobile traffic. This growth is expected to accelerate as the market moves toward 5G. We anticipate that traffic on Three's network by 2030 will be nearly [✂] higher than it is today. [✂].

Figure 2: Growth in Three's mobile and FWA traffic over time

[✂]

Source: Three

[8] Ofcom Dark Fibre Consultation 2017
[9] Openreach Dark Fibre Access Launch Briefing 2017

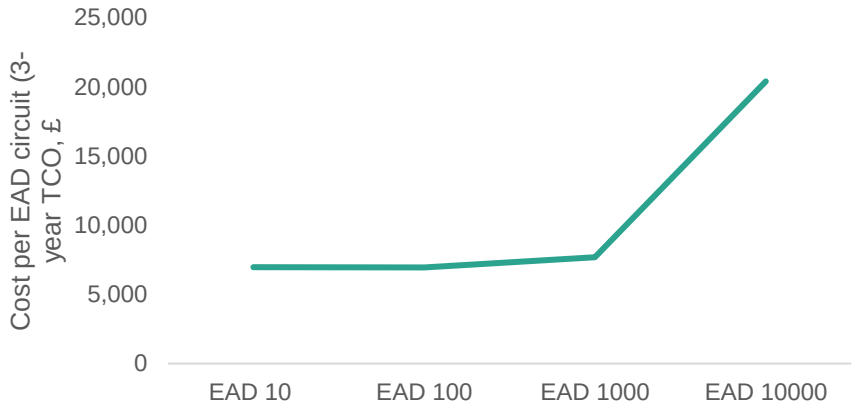
2.28. Openreach instead supplies regulated active Ethernet EAD lines directly to MNOs and indirectly through BT Wholesale, which uses the lines to supply a Managed Ethernet Access Service (MEAS) to MNOs. Overall, BT supplies 80–90% of all Ethernet fibre mobile backhaul to MNOs (historically through BT Wholesale).[10] BT Wholesale has used its market position, long-term contracts with minimum volume commitments and volume discounts to lock-in MNOs to BT's active Ethernet circuits.

2.29. These active products are designed and priced based on BT's network architecture. EAD lines provide both the fibre optic cable and the equipment at each end of the fibre. Openreach offers 10Mbit/s, 100Mbit/s, 1Gbit/s and 10Gbit/s EAD circuits, with the bandwidth of each circuit constrained by the capacity of the Ethernet equipment at the end of BT's fibre.

2.30. Increasing bandwidth requires a change of equipment in the customer's premises. This means that MNOs (other than EE) must incur new EAD charges every time we upgrade capacity on a site, creating a perpetual cycle of site upgrades and greater backhaul costs.

2.31. Moreover, BT's charges are entirely out of line with the underlying cost of provision. BT has exploited the flexibility of Ofcom's charge controls by setting prices for EAD circuits based on a 'bandwidth gradient', with charges for different bandwidths increasing with no relation to the underlying cost. The current Openreach EAD Ethernet price list is mostly flat until the large step change (x 2.6 times) in the per circuit price between 1Gbit/s and 10Gbit/s.[11]

Figure 3: Openreach's current pricing of EAD circuits



Source: https://www.openreach.co.uk/orpg/home/products/pricing/

2.32. BT's internal pricing papers discuss the factors BT considered in determining this gradient.[12] The step change in price between 1Gbit/s to 10Gbit/s circuits was based on customers' willingness to pay, not by reference to BT's underlying incremental costs. BT's aim was to ensure that the EAD 10Gbit/s price was

[10] CMA Acquisition by BT Group plc of EE Limited, Full Text Decision
[11] This comparison includes the one-off connection and annual rental charges undiscounted over three years.
[12] These were disclosed at the CAT in connection with BT's appeal to the BCMR 2016. See CAT Market Definition Judgement BT vs Ofcom, 2017, paragraph 210.

competitive against rival prices from Colt, Virgin and Zayo's 10Gbit/s products in London.

2.33. In particular, BT set the 10Gbit/s price "*at the higher level of industry requirements, allowing scope to reduce further in the future if required, to ensure competitive position in the market".*[13] According to BT, a steeper gradient between the 1Gbit/s and 10Gbit/s EAD prices *"would reinforce a perception [that] we are exploiting the bandwidth gradient linked to greater than 1Gb de-regulation and passives".*

2.34. In reality, the underlying fibre infrastructure needed to deliver all bandwidths is the same, and the cost is independent of the bandwidth. The difference in cost between bandwidths relates to the additional line cards and active equipment required to light the fibre – a one-off cost of about £500. The increase in the bandwidth gradient between the 1Gbit/s to 10Gbit/s EAD prices is much greater than the true incremental cost of an upgrade (i.e. mostly the small equipment cost differential).

2.35. This means that Openreach's regulated EAD circuits artificially inflate the cost of upgrading sites to 5G, discouraging migration from 1Gbit/s to 10Gbit/s circuits. If relative prices reflected the true incremental costs (i.e. with a flatter gradient between 1 and 10Gbp/s), MNOs would have a stronger incentive to upgrade sites to 5G more quickly and extensively.

2.36. The greater the capacity needs, the greater the cost difference between dark fibre and an EAD circuit becomes. One of the key benefits of dark fibre is the flexibility to upgrade to higher bandwidths at virtually no cost. Dark fibre pricing is independent of bandwidth and gives Three access to the full capacity of our equipment. This means that Three can lease all the capacity of the fibre at a fixed amount (regardless of usage). We can add bandwidth on demand based on our traffic needs while only incurring the one-off hardware upgrade costs.

2.37. Dark fibre breaks the critical link between ongoing backhaul costs and traffic increases, which is a key requirement for an MNO to provide competitive 5G services. Moreover, dark fibre limits the ongoing cost of upgrading bandwidth to the underlying cost, incentivising Three to rollout 5G more quickly and extensively than BT's active EAD leased lines.

3. We strongly support Ofcom's long-term strategy of encouraging the emergence of new fibre networks in competitive and potentially competitive areas

3.1. We support Ofcom's goal of encouraging a step-change in fibre investment by new players. The UK's experience suggests that access-based regulation cannot replicate the benefits of network competition in the fixed access market. BT's shareholders must not be allowed to dictate the extent and pace of fibre rollout in the UK.

3.2. This section explains the critical importance of i) supporting network competition where alternative fibre rollouts are viable; and ii) protecting access seekers through continued access-based regulation (including regulated dark fibre at cost) where they are not. A consistent application of this principle can be expected to lead to significant benefits for the UK economy, in both residential and business markets.

[13] CAT Market Definition Judgement BT vs Ofcom, 2017, paragraph 202.

Supporting network-based competition in fixed access (and cost-based wholesale access regulation where network competition is not feasible) is critically important

3.3. Ofcom's 2016 Strategic Review of Digital Communications signalled a key shift in policy towards network-based competition in fixed access. Growing awareness of the downsides of cost-based access regulation prompted a re-examination of Ofcom's policy. This has led to a search for an alternative arrangement in which competition, partial deregulation and continued cost-based regulation are each assigned their proper place.

3.4. Ofcom's focus has shifted from i) ensuring that Openreach's infrastructure is available for other operators to access at cost-based regulated prices to ii) incentivising operators to invest in their own infrastructure (where economic). In practice, in the most recent WLA and leased lines market reviews Ofcom has set price caps above Openreach's costs. This approach makes it more attractive to build (or sponsor) a network than buying wholesale access from Openreach, and it also allows new operators to earn higher returns on their fibre investment.

3.5. Ofcom's long-term vision is "*a new fibre future, with widespread availability of competing 'fibre to the premise' and cable networks to homes and businesses*".[14] The new strategy aims to "*help create more choice for people and businesses while reducing the country's reliance on Openreach*". Key to this ambition is the need to encourage the roll-out of new fibre networks "*as an alternative to BT's planned innovation in copper-based technologies*".

3.6. We support these goals. The Wholesale Fixed Telecoms Market Review 2021-2026 is the first opportunity for Ofcom to implement its vision across both residential and business markets. The key question in this review is whether Ofcom's vision of competing fibre networks serving 70% of the UK's population (in addition to Openreach and Virgin Media) is sufficiently realistic.[15]

3.7. The economics of fibre rollouts are very challenging, but Three is cautiously optimistic about the prospect of market entry over the period of this market review, at least in some segments and parts of the country. The chief reason is that the market has already attracted significant new fibre investment since Ofcom started signalling a shift in strategy in 2016, particularly from multi-service networks.

3.8. What has changed? Fibre rollout involves large sunk costs and very long payback periods, so expectations about future regulation are critical. Costs per household / site passed (and unit revenues) vary with local conditions: market entry was possible in the past, albeit targeted at areas with a high density of potential customers. Investors now expect Ofcom's proposals to improve the economics of fibre rollout, which makes entry and expansion into new areas profitable.

3.9. The key factor determining the degree of competition in an area is the number of suppliers with network presence and which are active in the supply of the relevant service in the area. The number of suppliers is determined by the size of the local market (largely, the number and density of potential customers in the area) and the cost of supplying it. Regulation can significantly affect both sides of the equation – i.e. both the revenues and costs of fibre rollout.

[14] Ofcom Initial Conclusions from the Strategic Review of Digital Communications 2016 , paragraph 1.2.
[15] For a negative answer, see Enders Analysis: *"Winners and losers as the UK fibres up"* (January 2020).

3.10. On the cost side, we support Ofcom's 2019 Physical Infrastructure Market Review decision to give unrestricted access to Openreach's pole and ducts (and regulating the maximum price to cost). This has been instrumental in bringing network competition in other European countries. Civil engineering works (i.e. digging trenches and laying fibre) are by far the biggest cost item when rolling out fibre.

3.11. Accessing Openreach's ubiquitous duct and pole network makes it cheaper and easier for new fibre players to build their own networks, cutting the cost of laying fibre cables by up to 50%. It is encouraging that over 80 companies are now looking to use this infrastructure, with planned use of over 40,000 poles and 5,000 km of duct (up from around 12,000 and 2,500km respectively in May 2019).

3.12. On the revenue side, Ofcom is also right to tailor regulation to the level of expected network competition in each part of the country. Provided the relevant geographic areas are appropriately defined (which in our view they have not been), Ofcom's proposals have real potential to:

- **Incentivise competing fibre network build in potentially competitive areas** – freezing regulated Openreach prices in real terms at 2021 prices[16] and banning geographic discounts in these areas will drive more attractive returns on investment for new players. Regulated wholesale prices would be closer to the costs of a reasonably efficient competitor (as opposed to those of an incumbent with large cost advantages), leaving greater headroom to enhance the economic case for new fibre rollout. The ultimate objective must be for these areas to become fully competitive and be deregulated as and when new fibre investment materialises;

- **Protect access-seekers in non-competitive areas** – in areas of the country where BT is likely to remain the only choice (because entry and expansion by new players is unlikely to be viable), operators should continue to have cost-based access to BT's infrastructure. This now includes an all-important regulated dark fibre product from BT to lower the cost of rolling out 5G into these areas (and the proposed RAB model which aims to give Openreach an incentive to build full fibre networks in these areas).

3.13. These proposals leave greater scope for the market to determine which areas of the country are genuinely competitive and which will remain natural monopolies best served by a single provider. Entry would occur where it serves the public interest. In areas where BT remains the only choice, regulation would continue to provide access to Openreach's bottleneck assets (at cost), mimicking the outcomes that would be expected in a fully competitive environment.

3.14. From our perspective as an MNO, the key aim is to ensure that an appropriately priced dark fibre product is available to enable 5G throughout the UK, either commercially (in the more competitive areas) or through regulation (in non-competitive parts of the UK).

3.15. We expect some operators to oppose Ofcom's proposals. They believe that Openreach's cost and reach advantages cannot realistically be replicated. They expect rollout by AltNets to be slow and warn that Ofcom is taking a big gamble: operators and consumers could transfer large amounts of money to BT if those rollouts are less successful than Ofcom anticipates. They want Ofcom to embrace "adaptive regulation" – i.e. continue to regulate BT's wholesale EAD, copper and

[16] EAD circuits at all bandwidths, MPF copper broadband and entry-level superfast broadband up to 40 Mbit/s.

VULA prices down to cost in potentially competitive areas, until rival investment materializes (on an area by area basis).

3.16. Three recognises the risks involved: we too are concerned about the prospect of higher wholesale prices in the short term (particularly on EAD 10Gbp/s circuits). But “adaptive regulation” fails to recognise the causal link between cost-based access regulation and lack of entry into the fibre market – the two cannot be divorced. That model of regulation has discouraged entry by new players in the UK, entrenching BT’s position in the market and delaying the availability of full fibre and dark fibre networks. There is no point in continuing to regulate BT down to cost in potentially competitive areas and expecting the results to be any different.

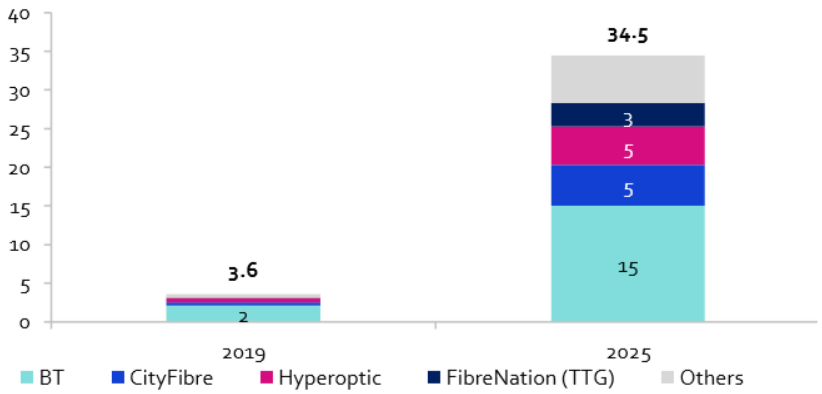
Ofcom’s new strategy has kick-started deployment of full fibre networks in the residential market

3.17. Unlike the business market, fibre penetration in the residential market to date is low – most consumers still rely on Openreach’s copper (or part copper, part fibre FTTC technology). In this environment, Ofcom’s shift in strategy has triggered a race between fibre providers to gain a first mover advantage. With 90% of the country still unaddressed, fibre providers can earn significant returns by persuading UK households to switch from BT’s copper to faster, more reliable fibre.

3.18. Full fibre deployment is picking up pace – coverage has more than tripled over the last three years. Virgin Media is now mostly using FTTP to extend its footprint (instead of its traditional Hybrid Fibre Coaxial cable). CityFibre is gradually establishing itself as the UK’s third infrastructure provider, having recently completed its acquisition of Fibre Nation and secured long term contracts with Three, Vodafone and TalkTalk. Smaller providers are also building full fibre networks.

3.19. Around 3.6 million premises were already covered by full fibre networks by December 2019 (circa 12% of total UK premises). Over half of those (2 million) were covered by Openreach, but alternative operators already pass some 1.6 million premises. CityFibre’s footprint already covers some 280,000 premises (including FibreNation’s 85,000 premises in Yorkshire), while Hyperoptic passes over 400,000 urban premises with FTTB.

Figure 4: Premises passed by full fibre as per reported plans (m)

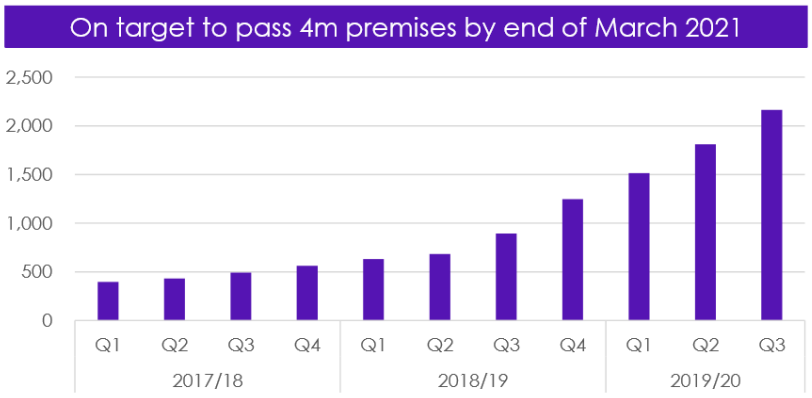


Source: Enders Analysis, *"Winners and losers as the UK fibres up"* (Jan 2020)

3.20. More importantly, since 2017 (when Ofcom published its proposals for fibre regulation for 2018-2021) CityFibre, Hyperoptic, Gigaclear, Virgin Media and others have announced plans to pass nearly 20 million homes and businesses by 2025. In combination, these plans will cover more premises than Openreach itself.

3.21. Importantly, rival investment seems to be stimulating fibre investment by BT itself. In September 2019 Openreach decided not to add new locations to the 2.7 million FTTC premises it planned to cover by March 2020. Openreach has now accelerated its full fibre deployment, passing 26 thousand new premises per week. Openreach is on track to reach four million premises by March 2021 and has just announced plans to extend its full fibre footprint to 20 million premises by the "mid to late" 2020s.

Figure 5: BT's full fibre deployment ('000 premises passed)



Source: BT Group plc Q3 2019/20 trading update (30 Jan 2020)

3.22. Progress in residential full fibre rollout has been evident and its connection with the new regulatory approach should be obvious. The UK is in a much better place today. This would not have been possible without Ofcom's shift towards network-based competition in fixed access.

3.23. Having three competing gigabit networks in 30-60% of the country by 2025 (including Three's 5G FWA Home Broadband service) is likely to be feasible. A key determinant of the viability and scale of a third fixed infrastructure provider will be the wholesale choices of home broadband players. BT and Virgin Media are effectively tied to their own networks, leaving only Sky and TalkTalk (and to a lesser extent Vodafone) as potential customers for new entrants.

3.24. We expect rollout plans to be firmed up in the next few years. Some of them may not happen or may only be undertaken over a much longer timeframe. Rollouts by Openreach, Virgin Media, CityFibre and Hyperoptic will likely overlap in urban areas. Rural areas are likely to remain monopolistic – i.e. served by the first provider to the location due to a smaller density of potential customers – or be served by several operators through an open access network (as seen in some EU countries).

3.25. Longer term, previous experience points to market consolidation: operators like C&W, Energis, MCI Worldcom, Thus and Global Crossing entered the enterprise market in the 1990's but were unable to make a return on investment. We expect genuine contenders to scale through acquisitions (e.g. CityFibre's purchase of Fibre Nation), while smaller operators are acquired or remain sub-scale and serve niche segments.

Dark fibre has started to be available in certain areas in the business market

3.26. The business market is much more mature than the residential market in terms of fibre availability. There has been no significant rollout of new leased lines networks in the past few years, but progress from CityFibre and Virgin Media's multi-service networks is encouraging. Dark fibre is starting to be available in certain areas as new suppliers are attracted to the market by the prospect of higher returns.

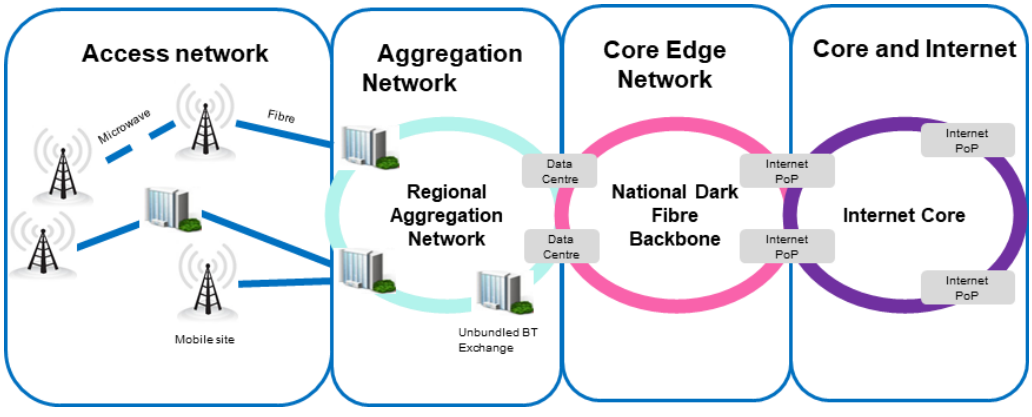
3.27. These are welcome developments as 5G requires a step change in backhaul capacity and performance. Three has historically been very dependent on managed services provided by BT Wholesale (MEAS). Our 5G strategy aims to encourage greater diversity of backhaul suppliers, migrating traffic from the BT MEAS managed service to higher capacity circuits at lower cost.

3.28. The optimal solution is to unbundle BT local exchanges in the aggregation network and maximise use of dark fibre in the radio access layer. To implement our new strategy, we are undertaking a complete overhaul of our transmission network:

- We have built a new core network and increased the number of data centres from 4 to 21 – this brings our core network closer to our mobile sites for improved latency;
- We are unbundling [✂] BT exchanges in our new aggregation network (connecting the exchanges to our date centres) with SSET. We plan to unbundle a further [✂] exchanges – this reduces our dependence on BT's active lines and allows Three to move to a dark fibre model; and
- We are procuring new circuits in the access network to connect approximately [✂] mobile sites to unbundled BT exchanges in 2020 (and a further [✂] sites by the end of 2021) – a hugely ambitious upgrade programme for [✂] sites within two years.

3.29. Figure 6 provides a schematic of our transformed transmission network, all the way from our mobile sites to our core network.

Figure 6: Three's overall transmission strategy



Source: Three

3.30. As shown in Figure 7, our transmission strategy in the access network is to upgrade thousands of sites from expensive, low capacity managed services (and microwave links) to much cheaper, high capacity dark fibre. [✂]. We are hoping that Ofcom's proposals will enable Three to make even greater use of dark fibre (reducing our exposure to EADs circuits correspondingly) in the future.

Figure 7: Overview of Three's transmission strategy in the access network

Source: Three

3.31. To implement this strategy, Three has recently appointed CityFibre as its preferred backhaul provider outside London. [✂] Three has also contracted with Virgin Media to deliver more than 3,000 dark fibre connections between 2020 and 2021 to enable our 5G rollout.

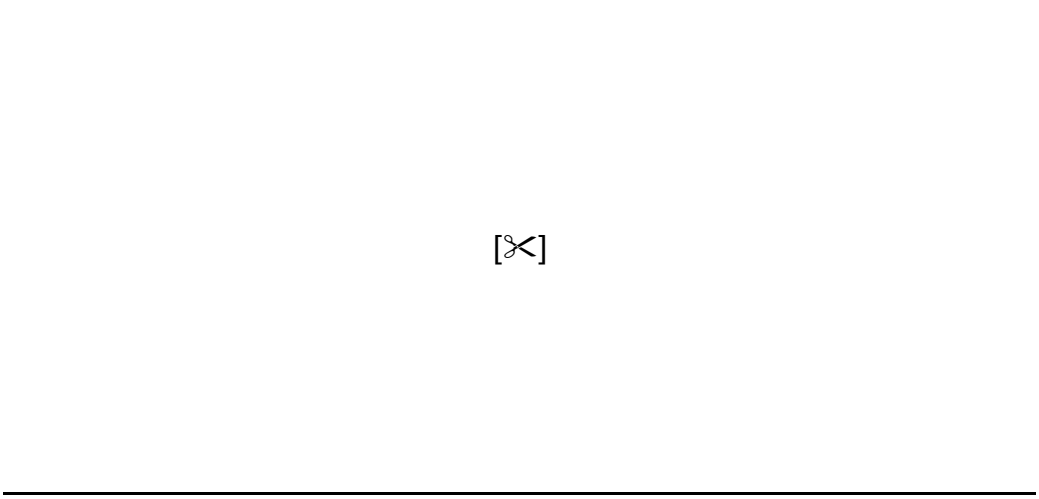
3.32. Consistent with the new regulatory incentive to invest in competing networks now, Three is building a parallel infrastructure to BT's even though we have already incurred connection and excess construction charges through our BT Wholesale MEAS service. It makes sense for Three to duplicate BT's infrastructure because dark fibre provides much greater capacity at lower cost, breaking the critical link between traffic and cost increases.

3.33. Our recent tender for connectivity for existing sites in the access network has given us a good understanding of our choices when connecting individual sites to BT exchanges. We asked operators to provide dark fibre connectivity between BT exchanges and our [✂] existing mobile sites within the next five years. All major MSNs and mobile backhaul providers responded to our request.

3.34. The results of the tender show that despite higher upfront charges, dark fibre providers are much more competitive than Openreach and BT. This is due to lower ongoing annual maintenance charges, which are fixed during the contract term. This evidence suggests that newer networks can match Openreach – even when Openreach already has a fibre connection to the site – provided they reach critical mass (e.g. from businesses, MNOs, residential and public users) in those areas.

3.35. Dark fibre providers are particularly competitive over longer time horizons due to their lower ongoing charges. [✂]

Figure 8: Total Cost of Ownership over time.



Source: Three

3.36. This explains why Openreach's 'regulated' EAD 10Gbp/s circuits are our least preferred option. [✂].

3.37. Secondly, dark fibre frees Three from BT's network design and gives us end to end control over our network. This allows more scope for differentiation. For instance, Three can break out of a fibre loop to connect to individual sites, rather than purchasing multiple point-to-point connections between BT exchanges and sites. Fibre loops are inherently more resilient – if cut or damaged, data is transmitted the other way around the loop.

3.38. Finally, and importantly, dark fibre from alternative providers levels the playing field between MNOs. BT has an incentive to discriminate in favour of its downstream arm EE.[17] Dark fibre from Virgin Media and CityFibre protects Three from this incentive.

3.39. Moreover, when upgrading 5G sites to 10Gbp/s links,[18] EE faces the true underlying cost (i.e. the resource cost to BT) as any payment between BT and EE will be a token one ('wooden dollars'). EE is not exposed to the cycle of site upgrades and backhaul costs increases that BT imposes on the rest of the industry through its artificial bandwidth gradient.

3.40. For these reasons, we will only consider BT solutions (such as MEAS or 10Gbp/s EAD circuits) where dark fibre is unavailable. [✂]

4. However, Ofcom's proposals will not deliver dark fibre connectivity in many areas and do not sufficiently protect access seekers in non-competitive areas.

4.1. Despite supporting the overall direction of travel, we disagree with some of the specifics in Ofcom's proposals. We discuss these issues and how Ofcom should remedy them in the rest of our response, namely:

- In Section 3, we discuss the risk that dark fibre will not be available in some parts of the UK on a commercial or regulated basis – because Ofcom's

[17] Ofcom Phase 2 Submission to the European Commission on BT plc Acquisition of EE Limited
[18] EE press release concerning 5G launch locations

geographic analysis does not accurately reflect the (prospective) availability of competing networks across the UK;

- In Section 4, we discuss the need to provide stronger protection to access seekers in the less competitive parts of the country – specifically, by implementing a charge control on Openreach's active leased lines, ensuring that the price cap on its regulated dark fibre product is appropriately set, and prohibiting geographic discounting in High Network Reach (HNR) locations; and
- In Section 5, we highlight the measures that Ofcom should take to ensure that the PIA remedy is useable for scale network deployments.

2. Ofcom's proposals will not deliver ubiquitous dark fibre availability throughout the UK.

5. Executive summary

5.1. Three supports network competition in fixed access where it is possible, but this requires Ofcom to separate out truly competitive from less competitive areas in its geographic analysis. The main constraint on BT's ability to exert market power is the potential for nearby rival networks to viably connect to our mobile sites. As things currently stand, Ofcom seems to be proposing loose or no regulation in many areas where no rival network is likely to emerge over the period of this review.

5.2. Based on the rollout plans disclosed in our access tails tender, BT will face no competing mobile access networks in large parts of Area 2, the HNR and CLA areas. Dark fibre will not be available for 5G in those parts of the country, as BT will not supply it commercially and there would be no other network to provide it either.

5.3. We have identified three broad reasons why Ofcom may be too optimistic in expecting rival mobile access networks in the areas in question:

- Ofcom's geographic market definition does not consider that multi-service networks may not offer leased lines, and that leased lines networks may not offer mobile access;
- Ofcom's use of large postcode sectors (and its 50% coverage threshold) make many non-competitive areas appear competitive or potentially competitive; and
- Certain fibre providers are incentivised to overstate their planned coverage to reduce the size of Area 3 (where regulated dark fibre from BT would be available).

5.4. Ofcom's geographic analysis should protect all users of Openreach access services and ensure widespread availability of dark fibre during this market review. This is particularly critical for MNOs given the necessity to deploy 5G networks now. We cannot wait until 2026 for Ofcom to correctly define the areas which require a dark fibre access remedy.

5.5. We propose one further geographic area ('Area 2.5') including locations with existing (or planned) competing fibre networks which either do not offer or do not have formally approved plans to offer mobile access. In this area, Ofcom should impose a dark fibre remedy with a price cap equivalent to the costs of an efficient sub-scale fibre provider. This would ensure that MNOs are protected, while incentives for alternative fibre providers to extend their networks are preserved.

5.6. Ofcom should also undertake a more precise geographic analysis by assessing competition in more granular units than postcode sectors (e.g. 1km^2 pixels). Only if a competing network covers (or has formally approved plans to cover) over 75% of a pixel with mobile access services (including for mobile access tails), should the pixel fall within the 'potentially competitive' Area 2.

6. Ofcom's geographic analysis overstates the availability of mobile access networks across the UK

6.1. Ofcom's geographic analysis of the leased lines access market splits the country into four regions. These are classified based on the degree of competition from fibre networks that Ofcom expects to find in each of those regions over the market review period.

6.2. Ofcom first bases its segmentation of the country into two areas (Areas 2 and 3) on the (prospective) presence of 'Multi Service Networks' (MSNs) offering both residential and business services. Area 2 comprises postcode sectors where there is already some material commercial deployment by rival MSNs to BT (or where MSNs have plans to build). Area 3 includes all postcode sectors where there is unlikely to be material commercial deployment by rival MSNs.

6.3. Ofcom then uses analysis from the 2019 BCMR on the network presence of leased lines-only operators to define two further leased lines markets (within the original Area 2). The premises covered by the Area 2 and Area 3 markets are similar for wholesale local access and leased lines access. The exception is postcode sectors in the CLA and HNR areas, which in Ofcom's view benefit from the additional competition of leased-lines only networks.

6.4. Based on Ofcom's analysis, we would expect a diversity of suppliers of mobile access in all geographic areas outside of the non-competitive Area 3 within the next five years. But we have not found this diversity in practice. As part of our mobile access tail tender (described in Section 1) we asked operators to provide connectivity between BT exchanges and all our existing mobile sites [✂] within the next five years. All major MSNs, dark fibre and mobile backhaul providers in the UK responded to our request.

6.5. Table 1 presents the results of the tender mapped to Ofcom's four geographic areas. We distinguish between areas where we find Openreach to be the only available network providing mobile access and where there are (prospective) alternative fibre networks. We restrict our analysis to mobile base stations that currently use leased lines [✂] and omit some [✂] sites which are likely to continue using microwave links over the period of this review (since they will not have an available fibre connection).[19]

[19] [✂]

Table 1: Results of Three's mobile access tender mapped to Ofcom's areas

[✂]

Source: Three

6.6. This shows that Ofcom's analysis seems to overestimate the number of rival operators that can connect Three's sites. Ofcom considers too many locations as 'competitive' or 'potentially competitive' (i.e. Area 2, HNR and CLA) and correspondingly too few areas as non-competitive (i.e. Area 3). Based on Ofcom's analysis:

- Three should have a reasonable choice of mobile access fibre provider for [✂] sites in Areas 2, HNR and CLA within the next five years – but our tender shows instead that alternative fibre providers can only connect [✂] sites over that timeframe; and
- There should only be [✂] sites with no alternative to BT – our tender shows however that BT will be our only option in respect of [✂] sites.

6.7. This is an important concern because the existence of rival networks already connected or sufficiently close is the key determinant of the level of competition for our sites. For genuine competition to exist, rivals must be able to connect at a viable cost, which depends largely on their proximity to our sites. Tender results show that there will be no rival networks able to connect to our sites in many parts of Area 2, HNR and CLA for competition to be effective.

6.8. Despite the lack of alternatives to BT within Ofcom's more competitive areas, cost-based wholesale charges would not be available in all of Area 2, HNR and the CLA during the 2021-2026 market review period. Furthermore, Ofcom does not intend to return to cost orientation in those areas in the 2026-2031 market review to provide fibre investors with ten years of stability.[20]

6.9. We do not think that Ofcom's geographic analysis strikes the right balance between protecting access seekers and promoting network investment over the period of this review. The proposed regulation allows Openreach to earn supra-normal profits without a realistic prospect of competition from rival networks over that timeframe. In effect, Ofcom seems to be prioritising its aim of promoting network investment over that of protecting consumers where competition is unlikely.

6.10. Three supports network competition in fixed access (including no or relaxed regulation in the more competitive areas). Our support is however conditional on

[20] Ofcom WFTMR Analyst Briefing January 2020

Ofcom being able to accurately identify and separate out these parts of the UK from the non-competitive areas, particularly in the provision of mobile access. Based on the results of our tender, we do not think this is currently the case.

7. The lack of a dark fibre remedy outside Area 3 means that dark fibre will not be widely available for 5G in the UK

7.1. Figure 9 illustrates the impact that a lack of competition will have on the availability of dark fibre in many parts of the country. Based on rollout plans submitted in our tender, dark fibre will only be available to connect [✂]. Openreach could supply dark fibre to all [✂] sites in Area 3 on regulated terms, and dark fibre operators can also reach [✂] sites in other areas commercially.

Figure 9: Breakdown of commercial dark fibre availability by area

[✂]

Source: Three tender of mobile access circuits

7.2. On the other hand, there would be no dark fibre available to connect the remaining [✂] in Central London, the HNR areas and Area 2, including high priority 5G sites in those areas. BT would be our only option, but it refuses to supply dark fibre commercially and the dark fibre remedy would only be available in Area 3. Breaking down these site figures by geographic area:

- Approximately [✂] of our sites in the CLA [✂] will have no dark fibre available (as there would be no alternative provider to Openreach); and
- Dark fibre will also not be widely available in the HNR or Area 2 – as Openreach will be the sole provider for approximately [✂] sites.

7.3. We discuss these issues in turn below. We then discuss the shortcomings in Ofcom's analysis which lead to these discrepancies and suggest how Ofcom can solve this by defining one further geographic area.

[✂] mobile sites in the CLA will have no dark fibre

7.4. The CLA consists of most of zone 1 in central London and the Docklands area. Ofcom finds greater competition in the provision of leased lines in the CLA owing to the presence of leased lines-only networks. Ofcom's analysis indicates that on average there are 4.3 rival networks within 50m of a business site (including mobile sites) within the CLA, and that 46% of these sites are within reach of five or more rival networks to BT.[21]

7.5. Based on the rollout plans operators have shared with us, we do not expect this level of competition in the CLA. In our experience, there are only a few alternative networks offering mobile access tails in the CLA – Virgin Media, EU Networks, Colt and SSE Telecom – and some of them (e.g. SSE Telecom) have a very limited footprint.

7.6. Responses to our tender indicate that, between them, these rival networks can only serve [✂] of our sites in the CLA over the next five years. BT will be our only choice for the remaining [✂] sites. Despite the number of potential suppliers, Three does not have a choice of alternative supplier to BT for most of our sites and would be exposed if BT sought to raise prices for mobile access.

7.7. This suggests that competitive conditions in mobile access are significantly different within the CLA. We ask Ofcom to build up a more rounded picture of competition by taking another look at the evidence, including the results of its network reach analysis specifically for mobile sites, the postcode data, information on rival prices and changes in market share over time, maps of ducts and connections and evidence on digging costs and distances in the CLA.

7.8. The specific impact in terms of the availability of dark fibre in the CLA is as follows:

- Three will be dependent on a rival (BT/EE) to connect [✂] in the CLA. BT would be under no regulatory obligation and Three would have no alternative if BT refused to supply (or raised the price of) its unregulated active EAD products. That Openreach continues to supply leased lines in the CLA after deregulation in 2016 gives us no comfort about BT's future behaviour;
- There will be no available dark fibre connections for approximately [✂] mobile sites in the CLA over the next 5 years.[22] This is a particular concern given that approximately [✂] of our network traffic is generated in London. Our network in this area would benefit disproportionately from the cost and flexibility benefits associated with dark fibre mobile access; and
- If BT agrees to supply, we would need to purchase EAD 10Gbp/s leased lines from Openreach in [✂] the CLA, despite the significant shortcomings discussed in Section 1. Because there is no proposed regulation in the CLA, Openreach will have complete pricing freedom on these lines (despite lack of competition from other network providers).

Dark fibre will also not be widely available in the Area 2 and HNR areas

7.9. Ofcom's classification of most postcode sectors in the UK as 'potentially competitive' is too optimistic. Area 2 includes an inordinately large number of locations ranging, from Openreach-only areas (plus a speculative planned rollout by an MSN) to areas with two rival MSNs (but only one of which is fully established).

[21] Ofcom WFTMR Consultation 2020, Volume 2, Table 7.6.
[22] [✂]

7.10. It is highly implausible that competitive conditions within Area 2 could be sufficiently homogeneous. We do not consider it appropriate to apply the same remedy (constant regulated prices in real terms for active EAD circuits) over such a broad range of areas.

7.11. There are large parts of Area 2 where alternative networks cannot connect to our sites over the period of this market review. Our tender results indicate that alternative networks can commit to serving only [✂] mobile sites in Area 2 and [✂] in HNR areas over the next five years.

7.12. This is inconsistent with Ofcom's assessment that there should be either existing or planned competitive network build in these areas by MSNs and/or leased lines-only providers. We have two concerns with Ofcom's approach:

- Again, our key concern is that there will be no dark fibre available to connect [✂] sites to our network in areas which will be a crucial focus of our 5G deployment over the next two to three years. [✂] are located within Area 2 and the HNR areas; and
- We will have to purchase 10Gbit/s EAD lines from Openreach instead of dark fibre. The prices of these circuits in Area 2 will be capped significantly above cost, while prices in HNR areas will only be subject to a 'fair and reasonable' requirement. This is despite Ofcom finding that Openreach has significant market power in these areas and there being no prospective competition to supply these sites over the market review period.

8. Why Ofcom's analysis overestimates the future availability of mobile access networks in the UK

8.1. Based on the evidence of our tender, we believe that the area of the UK that will be competitive or prospectively competitive over the period of this review could be significantly smaller than suggested by Ofcom's geographic analysis. This section explores the reasons for this discrepancy.

8.2. We can split the reasons for the discrepancy into three categories:

- Ofcom's analysis does not allow for the possibility that MSN networks may not offer leased lines wherever they have network presence, nor that leased lines networks may not offer mobile access services;
- Ofcom's postcode sectors and its use of a 50% coverage threshold suggest geographic areas are more competitive in the provision of mobile access than they are likely to be; and
- Operators may overstate the fibre coverage forecasts they submit to Ofcom.

8.3. Underlying all these reasons, our concern is that MNOs' connectivity needs for 5G do not seem to be receiving separate attention from other market segments (such as residential broadband and business connectivity) in Ofcom's geographic market definition.

8.4. We request that Ofcom conducts its geographic analysis specifically for MNO access connectivity and presents the results separately, so that MNOs can understand its conclusions about the extent of competition for mobile access tails in different parts of the country.

Ofcom does not allow for the possibility that MSN fibre networks may not offer leased lines wherever they have network presence, or that leased lines networks do not always offer mobile access services

8.5. We have identified two initial reasons why Ofcom's fibre forecasts may overestimate the future availability of mobile access networks in the UK. In both cases, the underlying issue is that Ofcom simply assumes that fibre operators will provide mobile access wherever they have a network.

Ofcom's assumption that MSNs provide both leased lines and WLA wherever they have a network presence

8.6. Initially, Ofcom segments the UK into Area 2 and Area 3 based on the expected presence of MSN networks providing both WLA and leased lines. This includes current and planned rollouts of Virgin Media, CityFibre and FibreNation (which is now part of CityFibre). In Ofcom's analysis, if a competing MSN is (prospectively) present in a geographic unit, the area falls into Area 2, otherwise it is in Area 3.

8.7. These MSN operators have suggested to Ofcom that their business plans assume the provision of both WLA and leased lines services.[23] Ofcom presumes from this that future MSN rollouts will be service-agnostic – i.e. will provide both services wherever they have network presence.

8.8. Planned MSN deployments have a large impact on Ofcom's results: the addition of MSN plans to existing MSN presence increases the proportion of UK premises covered by at least one rival MSN by 14.5 percentage points (from 55.3% to 69.8%).[24]

8.9. In practice, it is unlikely that MSN networks provide both WLA and leased lines access wherever they have network presence. This broad-brush assumption does not reflect market reality or sit easily with Ofcom's view that broadband networks may not easily provide leased lines, and that leased lines networks may not easily provide residential services.[25]

8.10. In principle, an MSN will not provide both WLA and leased lines where the size of the local market is sufficient to recover deployment costs from one segment only, and where it is too costly (or technically impossible) to serve the other segment. If an MSN is only capable of offering WLA but not leased lines in some areas, Ofcom's analysis will overestimate the availability of leased lines networks in Area 2.

8.11. For instance, an operator's rollout (e.g. Virgin Media's) may target residential premises and may not reach areas where businesses and MNO sites are located. As Ofcom has recognised, residential broadband networks are typically deployed in a different way from leased lines networks.[26] Because they target residential users, a residential network is built to pass large numbers of premises within its planned coverage area.[27] Business and MNO sites will often be too far away for the operator to viably provide leased lines in that area – e.g. because connecting them requires new duct and/or additional fibre.

[23] Ofcom WFTMR Consultation 2020, Volume 2, paragraph 7.20.
[24] Ofcom WFTMR Consultation 2020, Annexes, paragraph A8.78.
[25] Ofcom WFTMR Consultation 2020, Annexes, paragraphs A7.5-A7.6.
[26] Ofcom WFTMR Consultation 2020, Volume 2, paragraph 7.67.
[27] Ofcom WFTMR Consultation 2020, Annexes, paragraph A7.4.

8.12. To illustrate, [✂]. This means that Virgin Media may provide WLA but not leased lines, even within the same postcode area and where residential and business premises are in close proximity.

8.13. Another example is where providing a leased lines service is too costly for technical reasons (not due to distance). For instance, Virgin Media's residential GPON network is not suitable for business connectivity: there is no dedicated line from the customer back to the aggregation network, no guaranteed bandwidth or symmetric speeds. A GPON network cannot be used for leased lines without being reconfigured.[28] Where this is infeasible, the MSN will not be able to offer leased lines.

8.14. An MSN may also rely on regulated access to BT's poles to extend its network into an area. Although the network extension will support WLA, the fibres carried over the poles will not have the capacity to also provide a leased line (which requires a dedicated fibre line from the customer to the nearest BT exchange). Residential fibre services, on the other hand, tend to be based on GPON technology (or similar) which only requires a dedicated connection from the optical splitter located much closer to the consumer and, therefore, require much less pole capacity.

8.15. As a final example, Liberty Global and Telefonica have recently announced their intention to bring together Virgin Media and O2's UK operations into a 50:50 joint venture. This means Ofcom cannot safely assume that Virgin Media will continue to provide mobile access wherever it has network presence in the future.

8.16. In effect, Virgin Media (the second largest mobile backhaul supplier in the UK after BT and one of only two dark fibre providers of scale, alongside CityFibre) becomes a competitor in the retail mobile market. As a result of the merger, Virgin/O2 would have both the incentive and the ability to cease to supply dark fibre to Three, even in areas where it supplies WLA services.

8.17. The fact of the matter is that fibre operators target specific customer segments with their rollouts and pay close attention to the competitive implications of serving a rival. We ask Ofcom to take these practical considerations into account in its geographic assessment. Effective competition in mobile access in an area requires not only the existence of multiple suppliers with network presence in the area, but also that they actively supply mobile access services. Both conditions are needed.

Ofcom's assumption that all leased lines providers offer mobile access services

8.18. Ofcom's analysis does not allow for the fact that many leased lines networks only supply enterprise customers and not MNOs.

8.19. In its leased lines only evaluation, Ofcom assesses the number of providers offering leased lines within 50 metres of the geographic centroid of a postcode in which a business premise or MNO site is located. It finds an average of 4.3 competing networks connected or within 20 metres of a business in the CLA (1.9-2.9 in HNR areas).[29] It concludes that the leased lines markets in the CLA and HNR areas are more competitive than the rest of Area 2.

[28] Ofcom WFTMR Consultation 2020, Annexes, paragraph A7.10.
[29] Ofcom WFTMR Consultation 2020, Volume 2, Table 7.6.

8.20. Although this approach may give a broad picture of the number of networks located in the vicinity of business and MNO sites, it does not differentiate based on the type of service that those networks offer.

8.21. Unlike business connectivity, which tends to be concentrated in urban areas, mobile sites are geographically dispersed to cover most of the UK. There are many leased lines providers which solely serve large businesses in dense urban areas and business parks – for instance in Central London – but not MNOs. This is for the following reasons:

- Firstly, leased lines networks tend to expand incrementally, targeting a business district initially before considering other potential customers at a subsequent date. This approach based on incremental investments over time maximises economies of scope and scale. But it is not always possible to expand incrementally to serve an MNO site if the site is not located very close to the business district initially targeted (i.e. if the site requires new duct and/or incremental fibre);

- Secondly, not all leased lines providers' networks can offer the 10Gbit/s bandwidths required for 4G and 5G mobile connectivity in urban areas. For example, Ethernet in the First Mile (EFM) and Traditional Interface (TI) circuits are commonly used to connect smaller businesses but are inadequate for mobile access connections. Ofcom's analysis appears to include these connections in its definition of a 'leased line';

- Thirdly , even if a leased lines operator offers Ethernet services, connections to mobile sites are often more complex since they may require large programmes of civil works to make the final connection. Mobile sites are often located in hard to reach areas (such as fields and rooftops) whereas large businesses invariably have dedicated secure telecommunications rooms with connections to existing ducts. Business-focused leased lines providers are either unwilling to bear the costs of providing these final connections to mobile sites or do not have the specialist knowledge required to do so;

- Fourthly, MNOs have specific requirements beyond those that business customers need. For example, we require transport synchronisation and guaranteed latency, jitter, wander and packet loss levels to maintain our services. Leased lines providers which offer both mobile and business connections typically have dedicated teams to cater for MNOs' requirements, while leased lines providers which serve only business customers do not have the specialist expertise.

8.22. In theory, business-focused leased lines providers could invest in adapting their networks and onboarding greater expertise to also serve MNOs. The reasons why this is not happening are clear if one compares the numbers involved. In 2019, the City of London alone was home to 23,890 businesses[30] whereas we have only [✂] mobile sites in the CLA (a much larger area). A business-focused leased lines provider may not invest in changing its business models to compete for such a small market when its current addressable market is so much larger and more lucrative.

[30] City of London: Statistics about the City

8.23. Finally, business-focused leased lines networks may not have sufficient scale to present a viable option for MNOs, who generally prefer to contract with as few suppliers as possible:

- For example, [✂] This is far below the number of sites required for us to engage commercially with a network provider [✂];
- Similarly, [✂].

8.24. Therefore, Ofcom cannot simply assume that all leased line networks are viable providers of mobile access. By making this assumption, Ofcom may be significantly overestimating competition for mobile access connectivity where there is a leased lines network.

8.25. We ask Ofcom to distinguish between areas where fibre networks will provide mobile access and those other areas where, for whatever reason, MSNs and leased lines-only networks will not do so. These areas would go into Areas 2 and a new area (Area 2.5) respectively, with different remedies applied to them. We discuss this in more detail below.

Ofcom's use of large postcode sectors (and 50% threshold) makes many non-competitive areas appear more competitive

8.26. There is a second reason why Ofcom's fibre forecasts seem to overestimate the future availability of mobile access networks in the UK. Ofcom's geographic analysis is insufficiently granular. Ofcom proposes to group most areas into the Area 2, HNR and CLA buckets, despite large differences in the conditions of competition within each of these areas.

8.27. Firstly, Ofcom's choice of geographic unit is too broad. Postcode sectors vary substantially in size. The average area of a postcode sector is 10 square miles and the maximum is 1,400 square miles.[31] Outside the highest density areas of the UK, postcode sectors are very large and will inevitably include areas of limited network competition (due to limited demand). A unit of this size is unlikely to give a reasonable indication of the degree of competition within it. Fibre network competition can vary drastically within even an average sized postcode sector.

8.28. Ofcom's rationale for using postcode sectors is that it is a well-established unit that follows geographic boundaries and is practical to use (as there are only ten thousand units). We do not think Ofcom has struck the right balance here. Precedent and practicality should not take priority over accuracy, particularly when the cost of 'practicality' is leaving large parts of the country without dark fibre.

8.29. Using smaller geographic units would ensure that competitive conditions within each unit are more homogeneous. We note that Ofcom has previously used 200 metre x 200 metre pixels in relation to mobile networks, mapping pixels to postcode sector level data.[32] An option may be to use a square grid map of 1km^2 areas across the UK (i.e. approximately 244,820 geographic units) as the modelling unit for this analysis.[33]

8.30. Secondly, in its MSN analysis of Areas 2 and 3, Ofcom counts a network as present in a postcode sector where the MSN will cover (with existing and planned

[31] Beacon Dodsworth: All you need to know about postcodes but were afraid to ask
[32] For example, in its Economic Geography analysis. See Ofcom Economic Geography 2018
[33] If Ofcom does not consider an analysis based on 244,820 pixels is practical, slightly bigger pixels may be appropriate.

build) at least 50% of premises. Ofcom's rationale is that the approach is '*consistent with our strategy of promoting network investment and competition'.*[34]

8.31. A 1% threshold would also be consistent with a strategy of promoting network investment, but Ofcom needs to balance this against its duty to protect consumers where there is no competition. A 50% coverage threshold deems too many parts of Area 2 as potentially competitive. There will be no competition for mobile sites falling within the other 50% not covered by a rival MSN, but we will have no choice but to purchase a loosely regulated EAD leased line from Openreach (instead of dark fibre) to connect them.

8.32. In the 2019 BCMR Statement Ofcom explicitly rejected a 50% threshold as being "*too low a threshold to represent an area of sufficiently homogeneous competitive conditions*".[35] Ofcom found "*that a threshold that is too low would fail to represent an area of sufficiently homogeneous competitive conditions".* Ofcom has not sought to reconcile these findings with the use of a 50% threshold in its MSN analysis of Areas 2 and 3.

8.33. By contrast, for its analysis of network presence of MSNs and leased lines-only networks in the CLA and HNR areas, Ofcom uses a 65% threshold based on the analysis in the 2019 BCMR Statement.[36] If a 65% threshold is applied instead in the MSN analysis of Areas 2 and 3, the percentage of UK premises in postcode sectors with at least one existing rival MSN or planned coverage of rival MSNs would be 67.9% (i.e. almost two percentage points lower).[37]

8.34. We ask that Ofcom uses a threshold of at least 75%, combined with a 1km^2 modelling unit, as a way of ensuring that its analysis sufficiently protects access seekers and does not overestimate the presence of alternative fibre networks. As a bare minimum, Ofcom should carry out a separate assessment of the network presence of different operators specifically for mobile access, including a sensitivity assessment using a higher (i.e. 75-90%) threshold.

Operators may overstate their fibre coverage when supplying forecasts to Ofcom

8.35. Ofcom's geographic analysis is based on information provided by competing fibre networks on the extent of existing and planned coverage over the period of the review. We have reason to believe, however, that some of the build reported to Ofcom will not materialise over that timeframe.

8.36. Ofcom's assessment of areas of planned MSN build includes three types of rollout plans: [38]

1. **Build phase**: where the network is under construction or build is about to commence;

2. **Committed / more certain plans:** where planning is at an advanced, 'ready to build' stage (e.g. with all relevant senior management sign-off, funding and planning permissions in place);

3. **Less certain plans**: including where indicative analysis of potential towns, cities or areas has been carried out. These include lists of target towns with no further details.

[34] Ofcom WFTMR Consultation 2020,Volume 2, paragraph 7.24.
[35] Ofcom BCMR Statement 2019 paragraph 5.87.
[36] Ofcom WFTMR Consultation 2020, Volume 2, paragraph 7.78.
[37] Ofcom WFTMR Consultation 2020, Annexes, paragraph A8.79.
[38] Ofcom WFTMR Consultation 2020, Annexes, paragraph A8.44 and Volume 2, paragraph 7.30.

8.37. Ofcom includes all three types of plan because it thinks that they '*give a reasonable indication of the areas in which build is most likely to be attractive'*.[39]

8.38. The problem with including all three types (including the less certain type) is that some operators are strongly incentivised to overstate their coverage forecasts. It is no secret that infrastructure players like CityFibre and Virgin Media (and also EU Networks and Zayo) oppose the imposition of a cost-based dark fibre remedy on BT. In their view, the remedy would undermine their business case for investment in some areas and steer potential customers towards BT's dark fibre in the areas where it is available.[40]

8.39. These operators have asked Ofcom to reclassify non-competitive areas (Area 3, where regulated dark fibre from BT would be available) into prospectively competitive areas (Area 2, which is more loosely regulated). This protects their ability to deploy over most of the UK in the future, even if they have no intention of doing so during this market review period.

8.40. But these operators can achieve the same outcome by simply over-reporting their planned fibre coverage to Ofcom. Their incentive is to exaggerate rollout: a list of towns and cities with no further details is currently enough for Ofcom to bring the areas in question into Area 2. Even if they do not get to deploy in some areas during the period of this market review, they will have protected their ability to do so in the future.

8.41. We ask Ofcom to consider operators' incentives before taking their reported rollout plans at face value. These operators will bear no downside when those rollouts do not materialise. The downside will fall instead on access-seekers like Three (and ultimately consumers) who will have no dark fibre available for 5G and no other option than loosely regulated Openreach active products for the next five years.

8.42. There is a further risk that operators inadvertently overstate their future fibre coverage to Ofcom. We have identified two main reasons why this might happen:

- Rollout plans are often mutually exclusive - fibre providers try to avoid areas where Openreach has an FTTP network so that they can earn a reasonable return on their investment. Knowing this, Openreach might target its fibre rollout on areas that competitors have targeted to destabilise their long-term investments.[41] This could force competing providers to shelve their rollout plans for some locations.[42]

- We might expect the investment climate to worsen over the next few years, for example as markets continue to feel the effects of Covid-19. Fibre providers may struggle to access the funds they were expecting, and rollouts may be scaled back or delayed into the next market review period as a result.

8.43. These factors are most likely to reduce the rollout we see in areas where plans are uncertain or uncommitted (i.e. type 3 plans).

8.44. This is not a one-shot game: Ofcom will have a fresh opportunity to relax regulation to support a new wave of fibre investment in the next market review (2026-2031). Ofcom should not expose access seekers to soft regulation in areas where competition is unlikely to emerge over the period of this review. On the

[39] Ofcom WFTMR Consultation 2020, Volume 2, paragraph 7.31.
[40] See Virgin Media Response to Ofcom's Approach to Remedies Consultation 2019; CityFibre Response to Ofcom's Approach to Remedies Consultation 2019; IIG Response to Ofcom's BCMR, PIMR and Review of BT's RFS 2019.
[41] Ofcom Approach to Remedies Consultation 2019, paragraph 2.35.
[42] CityFibre response to Ofcom's BCMR 2019, paragraph 3.2.6.

other hand, Ofcom should not lock out fibre investment in this market review by imposing cost-based regulation in potentially competitive areas either.

8.45. For these reasons, we propose breaking Area 2 into two separate areas, with the dividing line being the status of planned rollouts (not existing rival network presence vs plans of different status).[43] Ofcom would distinguish between plans in build phase or committed (which would continue to go into Area 2) from the "less certain" plans (which would be included in a new 'Area 2.5').

8.46. Flat, inflation-adjusted regulated prices for Openreach's active leased lines would continue to apply in Area 2, but a (loose) dark fibre remedy would be applied in Area 2.5. We discuss this in more detail below. In our view, this categorisation strikes a better balance between protecting access seekers and promoting network investment in areas where the potential for fibre rollout over the period of this review is unclear.

8.47. Removing type 3 plans from Area 2 reduces the number of postcode sectors with existing or planned presence to 62% of UK postcode sectors (representing 68% of premises, a difference of nearly two percentage points).[44]

9. Ofcom should define a separate geographic market to include less certain rollout plans and networks providing WLA but not leased lines services.

9.1. We have shown in this section that Ofcom's approach to defining geographic markets would result in significant parts of the CLA, HNR areas and Area 2 not being prospectively competitive for the provision of mobile access services over the course of this market review.

9.2. To remedy this, Ofcom's geographic analysis should distinguish between plans in build phase or committed over the period of this review from the "less certain" category of plans. This is to mitigate the incentives of competing fibre providers to overstate their forecasts to artificially expand the size of Area 2.

9.3. We also ask Ofcom to differentiate between areas which will have dark fibre available for mobile access tails and those which will not (i.e. because an MSN is only capable of offering WLA and not leased lines).

9.4. We suggest that Ofcom can achieve both outcomes by including a separate geographic market in its analysis ('Area 2.5'), following the geographic segmentation reported in Table 2.

Table 2: Three's proposed geographic market categorisation

Area	Description
Central London	Geographic units of Central London where Openreach faces competition from two or more existing leased lines providers which offer mobile access tail connectivity.

[43] Ofcom WFTMR Consultation 2020, Volume 2, paragraph 7.43.
[44] Ofcom WFTMR Consultation 2020, Annexes, paragraph A8.82.

HNR	Geographic units of Metro City areas where Openreach faces competition from two or more existing leased lines providers which offer mobile access tail connectivity.
Area 2	Geographic units where there is already some material commercial deployment by competing MSNs, or where MSNs have formally approved plans to build (i.e. in build phase or committed). Existing and planned networks must be capable of providing leased lines (including mobile access tail connectivity).
Area 2.5	Geographic units where: • There is material commercial deployment by competing MSNs or (formally approved) build plans, but which will not provide leased lines (including mobile access tail connectivity); or • Competing MSNs have less certain build plans.
Area 3	Geographic units where no competing MSN has any current network or plans to deploy network of sufficient scale.

9.5. Given the responses to our tender, we would expect some areas of the proposed CLA, HNR and Area 2 to now fall into Area 2.5 once Ofcom refines its geographic analysis because either:

- The fibre provider's rollout plans in the area are speculative;
- An MSN only offers WLA in the area;
- A leased lines-only provider only serves business customers in the area; or
- The area falls within the 49% of an Area 2 postcode sector that does not have a (prospective) competing network.

10. Ofcom should impose a regulated dark fibre remedy in Area 2.5, charge controlled to retain incentives for competitive network build

10.1. There is a limited prospect of a competing network offering dark fibre in Area 2.5 over the market review period. Therefore, Ofcom should impose a dark fibre access remedy in Area 2.5 to ensure nationwide availability of dark fibre for mobile access tails at this critical stage of network deployment. This access remedy should be subject to a price control to ensure that Openreach cannot exploit its SMP to extract excess profits or price to restrict take-up of the service.

10.2. We recognise that fibre providers' deployment plans are fluid and that, given existing network build, Area 2.5 includes a number of locations which could be economic for fibre providers to extend their networks to offer dark fibre for mobile access services outside of this market review period. Therefore, it would be inappropriate for the charge control to be set at Openreach's cost of supply, as this would disincentivise competitive entry.

10.3. However, this competitive entry may not be forthcoming. For example, the CLA has been deregulated since 2016 and, despite Openreach's prices not being

regulated to cost since then, rival fibre networks can still only offer dark fibre services for mobile access tails to [✂] mobile sites.

10.4. The appropriate approach, which balances the need to protect dark fibre access-seekers and the incentives for competing dark fibre providers to invest in Area 2.5, would be for Ofcom to impose a dark fibre charge control where prices are set at a level above Openreach's costs. A charge control where prices are set to reflect the costs of an efficient sub-scale fibre network would be consistent with this approach.

10.5. In setting the charge control, Ofcom could borrow from margin squeeze theory and model costs based on those a reasonably efficient operator (REO) would face in offering an equivalent dark fibre access product. This would require Ofcom to define a hypothetical benchmark operator which, relative to Openreach, would have higher unit costs since it does not benefit from the same economies of scale and scope.

10.6. A network provider such as CityFibre, which is actively expanding its fibre network across the UK, would provide an ideal example of a benchmark provider. Ofcom could request cost information from similar fibre providers to estimate the costs of its hypothetical benchmark operator to construct its REO charge control.

10.7. If Ofcom was unable to rely on cost information from alternative fibre providers to build a reliable cost model to calculate dark fibre charges in Area 2.5 it could, instead, rely on adjusting Openreach's costs to reflect those of an alternative provider.

10.8. This would be consistent with the 'adjusted equally efficient operator' (adjusted EEO) approach that Ofcom has signalled it will take in its assessment of any margin squeeze appeals in the VULA market.[45] However, the REO approach would be most appropriate since it would likely result in a more accurate charge control which better represented the unit costs faced by an alternative network provider and, therefore, better protect investment incentives.

10.9. Ofcom should also extend its ex ante prohibition of geographic discounting to Area 2.5. This will ensure that Openreach is unable to act anticompetitively to deter alternative fibre networks from extending their networks in potentially competitive areas. The rationale for doing this is the same as Ofcom uses to propose a prohibition of geographic discounting in Area 2.

[45] Ofcom Approach to the VULA margin 2015

3. Ofcom's proposals insufficiently protect access seekers in Area 3.

11. Executive summary

11.1. Ofcom's proposals do not sufficiently protect access-seekers in Area 3 from Openreach's incentive and ability to abuse its significant market power.

11.2. Ofcom's proposed charge control for regulated dark fibre access services results in rental prices that are [✂] those charged by alternative dark fibre providers. This is inconsistent with Openreach having lower unit costs due to its economies of scale. We ask Ofcom to revisit its charge control modelling to ensure that the dark fibre access price cap is appropriately set.

11.3. We ask that Ofcom also charge controls Openreach's leased lines products to cost in Area 3. Although we prioritise dark fibre over alternative connectivity throughout the UK, many mobile sites in Area 3 will continue to rely on managed services from BT. The prices of these managed services will be inflated by providers being charged above costs for their inputs (regulated EADs) despite there being no prospect of competition at the access level.

11.4. We also invite Ofcom to extend its prohibition of geographic discounting to High Network Reach (HNR) locations. Large parts of HNR areas have no current network presence capable of offering mobile access tails. Openreach should extend geographic discounts to pre-empt competitive network build in these areas.

12. Ofcom should revisit its charge control for regulated dark fibre access in Area 3

Ofcom's dark fibre charge controls should reflect Openreach's efficiently incurred costs

12.1. As discussed in Section 1 above, nationwide dark fibre access is critical to the deployment of 5G networks. In potentially competitive areas, we would expect to have the option of purchasing dark fibre on commercial terms from fibre providers. However, Ofcom's proposed regulated dark fibre remedies will be our only dark fibre options in prospectively uncompetitive areas (Area 3 for access markets and from BT only exchanges for interexchange connectivity).

12.2. Cost-based regulation of the dark fibre access remedies will maximise allocative efficiency by ensuring that prices are kept close to costs. We agree with Ofcom that basing these costs on Openreach's current cost accounting fully allocated costs (CCA FAC) is appropriate as it reflects forward looking costs, including an appropriate allocation of common costs.

12.3. The only justification for setting dark fibre price caps above Openreach's efficiently incurred costs would be to encourage entry from competing network providers. Given that Ofcom is only proposing to impose dark fibre remedies in prospectively uncompetitive areas (Area 3 and BT only exchanges) this approach would be inappropriate. We, therefore, strongly support Ofcom's proposals to set the dark fibre access and interexchange remedies to reflect Openreach's efficiently incurred costs.

Ofcom's proposed rental price cap for its dark fibre access remedy in Area 3 is [✂] of commercial dark fibre providers

12.4. The scale of Openreach's network, the size of its customer base and the substantial fixed costs of deploying and maintaining a telecoms networks mean that it has large economies of scale and scope. Compared to smaller firms, Openreach:

- Spreads the fixed and common costs of providing a dark fibre service across a wider customer base;
- Spreads its common costs across a broader range of products; and
- Is likely to have smaller input costs where, for example, it can receive greater volume discounts from suppliers and contractors.

12.5. Therefore, the average cost Openreach faces to serve its customers should be much lower than sub-scale competitors. Given that Ofcom's dark fibre access charge control aims to set maximum unit prices equivalent to Openreach's efficiently-incurred costs, and that these costs will be significantly lower than competitors, we would expect maximum regulated dark fibre access charges to be significantly below those that alternative networks such as CityFibre and Colt can charge.

12.6. However, a comparison of Ofcom's proposed charges for its dark fibre access remedy against those charged by alternative providers indicates that access-seekers may often pay much more for ongoing access to Openreach's dark fibre access network in Area 3 than they do for comparable services from alternative providers elsewhere. The differences vary between connection and rental charges.

- **Connection fees**. Competing dark fibre providers generally require a much higher up-front connection fee compared to Ofcom's regulated dark fibre connection charge. This is unsurprising given that Openreach is often already connected to a mobile site so will not bear the costs of extending its network to meet a connection request. Where it is not connected, Openreach may be able to take advantage of its nearby existing infrastructure, to reduce its connection costs. Differences in connection charges may also reflect geographic cost differences in Area 3 compared to the more urban locations that alternative providers focus their network builds (where network connections can often be more expensive);
- **Annual rental charges**. What is far more surprising is the difference in rental charges between Ofcom's proposals and the charges set by alternative networks. Our comparison shows that Ofcom's proposed maximum rental charge is [✂]. We can see no objective justification for this. Openreach's economies of scale should make it cheaper for it to provide an ongoing dark fibre service than alternative networks, not [✂]. Annual rental charges are much less likely than connection charges to be affected by geographic differences.

12.7. Table 3 provides a simple comparison of Ofcom's proposed dark fibre access charges against [✂].[46,47] It highlights the significant differences between the dark

[46] [✂]
[47] [✂]

fibre access rental charges that Ofcom is proposing and those commercially offered by a typical alternative network. [✂]

Table 3: Comparison of dark fibre charges

[✂]

Source: Three tender of mobile access circuits

12.8. We ask that Ofcom revisits its cost modelling to ensure that the ongoing rental charges for its dark fibre access remedy are reflective of Openreach's ongoing costs. We do not have first-hand experience of the costs of running a fibre network, so it is difficult to for us to identify exact issues with Ofcom's analysis. However, we would suggest, as a starting point, that Ofcom should consider:

- Whether charging an annual rental fee for patch panels is appropriate. Our view is that there is a one-off connection cost associated with installing a patch panel, but no ongoing costs;
- Why the cost of installing a patch panel at an exchange is over four times more expensive than installing the same panel at a customer premises given that this is essentially the same service. Ofcom does not give a justification for this; and
- Whether it has appropriately allocated Openreach's common costs to the dark fibre access charge. Our view is that an overallocation of common costs may have inflated Ofcom's estimated dark fibre rental costs.

Ofcom should also revisit its interexchange dark fibre remedy charge control

12.9. A dark fibre connection from an exchange back to an MNO's core network is also a critical enabler of 5G as operators can benefit from increasing their backhaul capacity without the disproportionate increases in costs associated with purchasing active products to transmit traffic through our aggregation network.

12.10. In commercial areas of the country, we would expect to purchase dark fibre for our aggregation network from competing fibre networks. However, there will be some areas where competition will not arise, and Ofcom will need to intervene. We, therefore, support Ofcom's cost-based inter-exchange dark fibre remedy from BT only exchanges.

12.11. Unlike the dark fibre access remedy, we do not have a view on the efficient level of Ofcom's proposed charges for interexchange dark fibre lines as we do not currently purchase equivalent lines directly from network operators. However, we would expect Ofcom to also revisit its charge control analysis to ensure that its caps are set appropriately given that we have similar concerns with the costs of its dark fibre access remedy.

12.12. We also maintain that the interexchange dark fibre remedy should be extended to BT+1 exchanges, for the reasons set out in our response to the 2019 BCMR.[48]

[48] Three's response to Ofcom's 2019 BCMR, Paragraphs 4.1 to 4.18.

13. Ofcom should charge control leased lines to cost in Area 3

13.1. Ofcom proposes to take a different approach to regulated access pricing in Area 3 for leased lines networks than it does for WLA. Whereas WLA prices of all bandwidths will be charge controlled to cost in Area 3,[49] caps on the prices of active leased line circuits will be maintained at inflation-adjusted current levels.

13.2. This means that Openreach will be able to charge significantly above cost for the leased lines services which have not previously been charge controlled to cost and will be used to enable 5G technology (i.e. those with bandwidth greater than 1Gbit/s).

13.3. We support Ofcom's approach of not imposing a cost-based charge control on Openreach's leased lines services in potentially competitive areas to incentivise competitive network build. However, this reasoning does not apply to Area 3 since, by definition, we do not expect any competitive network build in this area. Therefore, Ofcom's approach to leased lines regulation in Area 3 is inconsistent with its stated aims of '*giving less weight to setting charge controls that incentivise rival network investment*'[50] and '*protecting consumers from excessive pricing*'[51].

13.4. Ofcom's justification for this divergent approach is that regulated dark fibre access is its 'primary remedy' in Area 3 and it seeks to encourage take-up of this remedy. However, it does not completely deregulate active leased lines as *'it will take time for telecom providers to transition to using new dark fibre services'*[52].

13.5. We do not consider it to be appropriate for Ofcom to dictate which services access-seekers should rely on in non-competitive areas. [✂]

13.6. [✂]

14. We support Ofcom's proposed prohibition of geographic discounting in Area 2, but it should be extended to HNR areas

14.1. We understand that a key concern of competing fibre network providers is that Openreach will act anti-competitively to undermine or pre-empt their investments. For example, Openreach can offer short-term discounts to existing customers in areas where it expects competing network build to prevent switching and, therefore, reduce the revenue opportunities of the entrant. Once the entrant has been forced out, Openreach is free to increase its prices in the absence of competition.

14.2. We support Ofcom's proposals to ban Openreach offering geographic discounts in Area 2 as it will ensure that fibre network providers can compete with Openreach on a level playing field. We agree that this must be an ex ante prohibition as ex ante regulation is clearer than relying on competition law. It gives competing fibre networks upfront certainty that Openreach cannot offer geographic discounts in potentially competitive areas. A contravention under competition law is subject to interpretation by the courts so cannot give the same certainty as an ex ante prohibition.

14.3. Ofcom does not propose to also prohibit geographic discounts in HNR areas on the basis that it would '*impede Openreach's ability to compete with established*

49 Plus a margin to allow Openreach to recover its full fibre deployment costs in Area 3.

50 Ofcom WFTMR Consultation 2020, Volume 4, paragraph 2.7.

51 Ofcom WFTMR Consultation 2020, Volume 4, paragraph 2.6.

52 Ofcom WFTMR Consultation 2020, Volume 4, paragraph 2.86.

rivals and deprive consumers of the benefits of that competition"[53]. However, our analysis shows that [✂] sites in HNR areas have no existing competitive network build nor plans to do so within the next five years. However, given the characteristics of these areas, longer-term deployments may be feasible.

14.4. Absent a ban on geographic discounting in the HNR, Openreach will have the ability to target price reductions in particular HNR areas to preclude future competitive entry and deter any longer-term build plans. Ofcom should, therefore, extend its geographic discounting prohibition to HNR areas.

[53] Ofcom WFTMR Consultation 2020, Annexes, paragraph A15.52.

4. The requirement for Openreach not to unduly discriminate has not resulted in a level playing field for access seekers.

15. Executive summary

15.1. We support cost-based regulation for the Physical Infrastructure Access remedy, which is essential to allow rival network investment and to ensure a level playing field between fibre providers.

15.2. However, the requirement for Openreach not to unduly discriminate has not resulted in a level playing field, rather non-BT providers face material disadvantages. We describe issues that could cause delays for access seekers, undermine their business cases or event prevent them from using DPA. All these issues could result in efficient rival network investment not going ahead.

15.3. Lastly, we explain that if Ofcom cannot rectify these issues, it should consider imposing an Equivalence of Inputs requirement on Openreach. Failing this, Ofcom should require Openreach to objectively justify any instances where it does not provide DPA services on an EoI basis.

16. We support cost-based regulation for the Physical Infrastructure Access remedy ask Ofcom to report on take-up and potential issues.

16.1. We continue to strongly support Ofcom's decision to impose an unrestricted Duct and Pole Access Remedy on Openreach. The DPA remedy should reduce the time and cost of deploying competing fibre networks. As we explained in our response to Ofcom's 2019 Consultation, *Physical Infrastructure Market Review: Access to ducts and poles to support investment*, we had explored solutions based on non-telecoms physical infrastructure but found these options not to be scalable.[54] Absent the DPA remedy, we would continue to rely on BT for transmission in rural areas.

16.2. Through discussions Three has had with fibre providers, we understand that the current DPA remedy is useful for certain network deployments. In particular, we understand that regulated access to BT's poles is very useful for residential broadband deployment.

16.3. We agree with Ofcom that a cost-based charge control should be applied to provide strong incentives for rival network investment and to ensure a level playing field between telecoms providers and Openreach when making use of the physical infrastructure.

16.4. We ask Ofcom to publish information on the take-up of DPA, both nationally but also at a regional level, and on the barriers that current and potential users of DPA are encountering. Doing so will provide more transparency as to whether Ofcom's policy intentions are being met through the DPA remedy and allow access seekers to identify and common issues that they face.

[54] Three Response to Ofcom's PIMR consultation 2019, paragraph 11.

17. The requirement on Openreach not to unduly discriminate has not resulted in a level playing field for access seekers.

17.1. While DPA is essential, there are important changes required to ensure the remedy is as useful and widespread as possible, such that it helps meet Ofcom's intentions. We discuss these below.

17.2. In its June 2019 PIMR Statement, Ofcom imposed a "no undue discrimination" condition on Openreach, "primarily to prevent the dominant provider from discriminating in favour of its own downstream divisions in a way that would harm competition and competing telecoms providers".[55]

17.3. Ofcom explained that without such an obligation, "the dominant provider has the ability and incentive to provide wholesale network access on terms and conditions that discriminate in favour of its own downstream divisions, thus distorting competition and harming consumers' interests".[56]

17.4. However, the "no undue discrimination" requirement on Openreach has not resulted in a level playing field for access seekers. The fundamental issue is that DPA remains a product consumed by rivals of either BT or Openreach, and so Openreach may have incentives to frustrate the take-up of DPA. By doing so, Openreach could aim to hinder the ability of retail providers to compete with BT and/or wholesale providers to compete with Openreach.

17.5. As we explain below, BT is not in the same position as other access seekers, and in fact other access seekers are materially disadvantaged. We list several issues below, categorised into those that could:

- Cause delays for access seekers;
- Undermine the business case of access seekers; meaning that some efficient rival network investment may not happen; and
- Prevent access seekers, either fully or partially, from using DPA as they wish.

<u>Issue that cause delays for access seekers</u>

Process for dealing with blockages and congestion

17.6. One of the most significant issues that affects rival providers is the process for dealing with blockages and congestion. When Openreach encounters them, it can immediately proceed to rectify any issues, but other providers face significant delays in the process, and crucially depend on Openreach before they can proceed.

17.7. Other providers must first report the issue to Openreach, which will then notify the provider of how it intends to rectify the issue within five days. Openreach does not confirm the date on which the issues will be fixed for 13 working days, meaning that providers can face delays longer than two weeks in getting issues fixed, significantly holding up their fibre network rollout.

17.8. We ask Ofcom to require Openreach to respond to other providers and fix blockages and congestion more quickly.

[55] Ofcom PIMR Statement 2019, paragraph 4.67.

[56] Ibid.

Wayleaves

17.9. Many Openreach assets such as poles are on private land, with access governed by wayleaves. BT can assume deemed consent to make use of Openreach's existing wayleaves, but other providers must either get their own wayleave or confirm that they can use Openreach's. This causes challenges and delays, putting other providers at a disadvantage compared to BT.

17.10. We understand that previously, Openreach argued that wayleave information did not form part of the PIA product, and so did not provide any information as part of the standard DPA product. Openreach offered providers the option to pay to search its archives but charged on an hourly basis and often limited information was given.

17.11. From speaking to users of DPA, it now appears that Openreach does provide some information on wayleaves. However, for this to be useful, providers must be able to ascertain whether individual addresses are covered by the necessary wayleave. Openreach has refused to provide this level of information, citing Data Protection grounds and arguing that this is personally identifiable information, and instead provides postcode-level information, which is not useful.

17.12. This seems at odds with the fact that providers can pay Openreach to search its archives, to determine whether a specific address has the relevant wayleave. It therefore appears that Openreach is attempting to delay the wayleave process, without any objective justification.

17.13. We therefore ask that Ofcom compels Openreach to quickly confirm whether individual addresses, specified by fibre providers, have the necessary wayleaves in place. From December 2017, new wayleaves put in place have been automatically shareable. Ideally, the law would be changed so that if providers are looking to install in or on existing Openreach assets, any wayleave in place should automatically allow sharing (even if it were put in place before December 2017). We understand this is outside of Ofcom's remit, but would ask Ofcom to discuss with DCMS whether such change is possible.

Openreach has better information than other providers and can pre-clear issues before starting to rollout

17.14. Openreach has the advantage of knowing when specific assets will be available for providers to deploy on or in. This means that Openreach can prepare in advance of the infrastructure going live, giving it a head start compared to other providers. We ask Ofcom to require Openreach to make such information available publicly, so that all fibre providers have the same information about the future availability of assets and can compete on a level playing field.

17.15. In addition, when providers notify Openreach of plans to use DPA and specify which assets they plan to use, no preparation or examination of the assets can be done in advance of the provider arriving at the location. The provider is not allowed to do this work itself and must instead wait for Openreach.

17.16. We suggest that once a provider gives Openreach firm plans to use certain assets for DPA, Openreach would be required to inspect the assets promptly and start clearing and rectifying any issues in advance of the provider arriving at the location. As Openreach will not have received any payment by the time it receives a Notice of Intent, we consider it appropriate that the access seeker would be

required to pay a deposit, that was non-refundable if the access seeker then decided not to proceed (except for reasons outside of its control).

Network Adjustment Process

17.17. We are aware of two issues relating to the Network Adjustment Process. Both can introduce frustration and delays to the PIA ordering process.

17.18. The first is that there is uncertainty around what issues are considered Network Adjustments. For example, Openreach considers that when a provider comes across a blocked or collapsed duct, other routes (such as overhead) should be considered before the Network Adjustment process is explored. We understand that Openreach has started to change its position on this issue, but Ofcom should continue to monitor for any similar issues and provide guidance or clarity where appropriate, to avoid scope for Openreach to introduce delays to the process.

17.19. The second is that Openreach's systems do not appear to be well set up for large-scale orders of PIA, as they were set up in 2012. [✂] We ask Ofcom to consider whether Openreach's systems should be updated, such that they are significantly less time-consuming for large-scale fibre deployments.

Factors that undermine the business case of other providers

The requirement to forecast volumes

17.20. Providers must provide volumes forecasts to Openreach nine months in advance of access, otherwise Openreach is not obliged to provide the necessary access. While we understand that Openreach does need to have some indication on future demand, forecasting nine months ahead is difficult and not always compatible with the shorter lead times fibre providers are dealing with.

17.21. In addition, if actual build deviates significantly from the forecast then the relevant Service Level Agreements (SLAs) and Service Level Guarantees (SLGs) do not apply. As BT does not consume DPA, these issues only apply to other fibre providers. This asymmetry could undermine the business case of fibre providers, because they risk not having the SLAs and SLGs in place if their forecasts are materially different from their actual deployment. We ask Ofcom and Openreach to recognise that forecasting is very difficult, and that as such the penalties for deviating from forecasts should be less severe.

Openreach has the necessary information to respond to rival network build

17.22. Once a provider signals their intent to use DPA, Openreach receives a Notice of Intent. Upon receiving an NOI, Openreach has the necessary information to respond to the rival's network build if it desired, with the long-term goal of undermining the business case for rivals. If rivals were concerned that Openreach would build in response to their deployments, this could undermine their business case and result in efficient rival network rollout not happening.

17.23. The Map Planning Tool[57] also changes colour when a provider submits an NOI. It is not clear what benefit this serves, compared to only changing colour when new network build has been completed. We ask Ofcom to consider this information asymmetry and whether more measures can be put in place to prevent Openreach having the information it needs to respond to rival network build.

[57] Openreach Fibre Broadband webpage.

Contract lengths for DPA

17.24. Providers that plan to use DPA will require a positive business case to proceed. Whether a business case is positive will depend on the expected cost of the investment as well as the expected payback, accounting for any potential uncertainty.

17.25. We understand that previously, Openreach offered providers 5- and 10-year contracts for Duct and Pole Access. However, it has since removed the 10-year option, which means that providers can only be certain that they will have the required access for 5 years.

17.26. Openreach argues that it has a regulatory requirement to provide PIA, and therefore does not need to provide longer-term contracts. In reality, this means that other providers face significant uncertainty beyond the initial 5-year period because they cannot be sure that Ofcom will maintain the same regulation on Openreach. BT, on the other hand, can be confident that it will continue to have the required access because doing so is profitable for the BT Group, regardless of whether Openreach has a regulatory requirement to allow DPA.

17.27. This has the potential to undermine the business case of other providers, which could result in some efficient rival network investment not taking place. We therefore ask Ofcom to consider whether Openreach should be compelled through a regulatory requirement to offer longer contract lengths. Ofcom could use its formal information gathering powers to ask current and potential users of DPA for the contract durations they are seeking and that underpin their business cases.

<u>Factors that could prevent rivals from making use of DPA (or reduce the extent to which they can use it)</u>

Requirement to comply with engineer principles

17.28. Openreach requires access seekers to comply with detailed engineering principles. If the access seeker does not comply fully with the principles, Openreach is not obliged to allow access to its assets because this constitutes a breach of the Reference Offer. This puts other providers at a material disadvantage, as they risk not being given the required access.

17.29. We understand that, as a general principle, Openreach adheres to its own engineering principles but it faces no consequences for not doing so. [✂]

Overbuilding by Openreach

17.30. Given that rival fibre competitors can make use of the DPA remedy (subject to Openreach having remaining capacity in its ducts and poles), Openreach could have the incentive to fill up capacity to prevent its rivals from making use of the remedy.

17.31. We understand that Openreach may be, at least in some instances, using space-consuming equipment, e.g. using larger equipment than other providers when deploying on poles. The reason for this is not clear, but this could be consistent with a possible strategy of Openreach aiming to fill up capacity where possible. This could mean that providers' deployment are prevented (or at least the scale reduced).

17.32. We ask that Ofcom continues to monitor Openreach's behaviour in this regard, including by asking (using its formal information gathering powers) existing and

potential future users of DPA for feedback specifically in this area. We also ask Ofcom to consider allowing other providers to reserve capacity in Openreach's ducts and poles. To avoid purely speculative reservations, we consider that providers would be required to pay a deposit, perhaps equal to the rental for the relevant assets. If the provider subsequently decided not to deploy, then we consider any deposit should be non-returnable, unless the decision is due to factors outside the provider's control.

18. Ofcom should consider imposing an EOI requirement on Openreach if these issues cannot be rectified.

18.1. As we have explained above, despite the requirement not to unduly discriminate, the reality is that non-BT providers are materially disadvantaged compared to BT, and they do not compete on a level playing field. This stifles Ofcom's ambitions to stimulate widespread rival fibre network build.

18.2. If Ofcom cannot rectify these issues, it should consider imposing an Equivalence of Input requirement on Openreach, such that Openreach is in an identical position to other providers. We recognise that imposing such a requirement may require Openreach to change the way it functions, but Ofcom must retain this regulatory option if it hopes for DPA to be used as effectively and widely as possible to promote rival network build.

18.3. Should Ofcom not consider that an EOI requirement on Openreach is justified, as a backup option Ofcom should impose an upfront obligation that Openreach must objectively justify all instances of non-equivalence.