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Wholesale Local Access Market Review

Consultation on Duct and Pole Access remedies

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	Consultation
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About this document

This consultation follows our Strategic Review of Digital Communications (“Strategic Review”), and our ‘Initial proposals to develop an effective PIA remedy’ (“2016 PIA Consultation”) to support investment in ultrafast broadband networks, published in December 2016.

This consultation concerns Openreach’s duct and pole access product, known as Physical Infrastructure Access (PIA). It builds on our 2016 PIA Consultation, which outlined our initial views on how to link the initial conclusions made in the Strategic Review to specific actions. In that document, we sought input on what Openreach’s PIA product could be used for, how it should work in terms of process, and how charges could be set.

We now set out our further proposals in light of the analysis we have undertaken as part of our review of the Wholesale Local Access (WLA) market, as well as the input we have received from stakeholders. These proposals form part of that review and this consultation supplements our 2017 WLA Market Review Consultation.

This consultation will close on the 15 June 2017. Please send your responses via our website: <https://www.ofcom.org.uk/consultations-and-statements/category-2/duct-pole-access-remedies>

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Section 1

Executive summary

Duct and pole access to encourage investment in fibre networks

- 1.1 This consultation sets out Ofcom's proposals to improve access to BT's network of poles and underground ducts that carry telecoms cables. Improving duct and pole access will make it quicker and easier for rival providers to build their own fibre networks, promoting infrastructure-based competition. This document forms part of our review of the Wholesale Local Access market and explains how these proposals will remedy the competition concerns arising from BT's significant market power.

Key proposals

Access to BT's ducts and poles. We intend to shift our strategic focus from active to passive remedies and propose to enhance the effectiveness of the existing Physical Infrastructure Access (PIA) remedy. This remedy requires BT to allow other telecoms providers to deploy their own networks in BT's underground ducts and chambers or overhead on its telegraph poles. This network access obligation includes a requirement for Openreach to make adjustments to the existing infrastructure so it is 'ready for use' – repairing faulty infrastructure and relieving congested sections where necessary.

Enabling greater flexibility in the use of ducts and poles. We propose to relax the current PIA usage restriction to allow 'mixed usage': telecoms providers can deploy local access networks offering both broadband and non-broadband services provided the purpose of the network deployment is primarily the delivery of broadband services to consumers.

Access on equivalent terms to ensure a level playing field. We are proposing a 'no undue discrimination' condition on BT, requiring strict equivalence in respect of all processes and sub-products that contribute to the supply and consumption of duct access, unless BT can demonstrate that a difference is justified. The condition would also mean equivalence in how costs associated with duct and pole access are recovered. We propose to support these measures through careful, continual monitoring to ensure that they are effective.

Access to digital maps to support large-scale network planning. We propose that telecoms providers should have integrated access to digital maps with Openreach's duct and pole network records including detailed location information and the extent of spare capacity.

Processes to ensure efficient network deployment. We are proposing that BT should be required to publish a Reference Offer for PIA, setting out how operational processes (e.g. ordering PIA, clearing blocked ducts) will work, together with relevant terms and conditions including service level agreements and guarantees. The final stage involves connecting the customer, where BT's poles have an important role to play. We propose that BT should be required to ensure capacity for additional dropwires is available for telecoms providers to connect individual homes, with Openreach having operational flexibility to determine how best to provide that capacity.

Pricing to support competitive investment. We propose to set a cap on PIA rental charges, using the current methodology as a starting point for our calculations. We will publish specific proposals in the summer. We also propose to put in place specific pricing obligations for ancillary charges relating to build and enabling works, with the associated costs to be recovered from all users of the infrastructure, subject to appropriate limits.

Strategic context and the market review

- 1.2 One of the key elements of our Strategic Review of Digital Communications is to make a strategic shift to encourage the large-scale deployment of new ultrafast broadband networks, including fibre direct to homes and businesses (sometimes called ‘full-fibre’). Full-fibre networks support advanced services, with very high speeds of 1 Gbit/s or more. They also offer greater reliability and predictability, without the ‘up to’ speed limitations of copper-based broadband services.
- 1.3 Network competition is a powerful driver of innovation, leading to higher quality and lower prices. Investment in new competing fibre networks will create an alternative means of delivering world-class connections to people and businesses, in addition to the innovations in copper-based technologies currently being planned by BT, and advanced improvements to Virgin Media’s cable network.
- 1.4 There has been a number of recent announcements of interest in fibre investment by large and smaller providers. For example, by 2020, BT is planning to deploy full-fibre networks to up to 2 million premises and Virgin Media intends to extend its network to reach a further 4 million premises, half of which are to be connected using full-fibre. In addition, TalkTalk and CityFibre are to extend their full-fibre trial in York from 14,000 homes to cover 40,000 further premises over the next 18 months, and KCOM in Hull is currently upgrading its network to pass 150,000 premises with full-fibre.
- 1.5 A key element of our strategy to promote infrastructure-based competition is to make it quicker and easier for rival providers to build their own fibre networks by improving duct and pole access (DPA): access to the network of poles and underground ducts that carry telecoms cables. To support this, regulated pricing for wholesale superfast and ultrafast broadband services should ensure the incentives are there for operators to build new networks rather than relying overly on buying access from BT.
- 1.6 In addition, securing the planning rights and wayleaves to be allowed to undertake civils work and install cables is a critical part of the network build process. We are working with the Government, which also wants to see greater fibre roll-out to more homes and businesses, and has therefore announced initiatives to simplify planning rules and provide 100% business rates relief for new fibre infrastructure for five years from 1 April 2017.
- 1.7 Telecoms providers can now gain access to physical infrastructure across different sectors (such as electricity, water and transport services, as well as telecoms) through the Access to Infrastructure (ATI) Regulations. However, we understand the greatest interest for broadband deployment remains in using BT’s duct and pole infrastructure which focuses attention on BT’s regulatory obligations to provide a form of DPA known as Physical Infrastructure Access (PIA).
- 1.8 We are examining access to BT’s ducts and poles as part of our review of the Wholesale Local Access (WLA) market. Last month we published our market review proposals, setting out our provisional finding that BT continues to have significant market power (SMP) in the WLA market in the UK excluding the Hull Area.
- 1.9 Our view is that the competition concerns arising from BT’s SMP are best remedied in the long run by promoting infrastructure-based competition in local access networks. The high costs of deploying physical infrastructure, such as ducts and poles, remains a barrier to large-scale network deployment in significant parts of the country as these costs constitute a large proportion of the overall capital expenditure of an access network, typically of the order of 50% to 70%. Reusing existing

underground ducts can also reduce the time it takes to deploy a new network: whereas in some cases it can take days to build 200m of duct using traditional construction methods, fibre cables could be installed in the same length of existing duct in a matter of hours. DPA is therefore an important remedy to address the competition concerns in order to promote competition in broadband and fixed telephone services.

Duct and pole access remedies

- 1.10 Our Strategic Review of Digital Communications identified five actions to address the challenges faced by telecoms providers, noting the limited take-up of PIA to date:
- **usage restrictions:** removing usage restrictions where the PIA remedy is used to deploy broadband access networks to homes and businesses at scale;
 - **equivalence of inputs:** working to apply equivalence of inputs between BT and other telecoms providers, for example, in terms of timescales, processes and terms and conditions;
 - **better information:** requiring Openreach to provide an online database of duct and pole assets so competitors can plan new networks;
 - **efficient operational processes:** ensuring operational processes are efficient, appropriately streamlined and established early; and
 - **pricing:** reviewing pricing of the PIA remedy, including ancillary service charges.
- 1.11 Following our consultation in December 2016, there was broad agreement among industry respondents that we had correctly identified the problems faced by telecoms providers using PIA.

Access to BT's ducts and poles

- 1.12 We are proposing to impose a specific access remedy in the form of PIA which would require BT to allow other telecoms providers to deploy their own networks in BT's underground ducts and chambers or overhead on its telegraph poles.
- 1.13 We recognise that sometimes it will be necessary for Openreach, BT's network division, to make some adjustments to the existing infrastructure to ensure the PIA remedy is effective and we consider that our proposed access obligation provides for this. For example, where there are congested sections of BT's duct network, it may be necessary to repair or enhance the infrastructure to realise the benefits of sharing BT's infrastructure over a much wider area. However, this requirement should be limited to situations where the adjustment is necessary to facilitate access to BT's existing physical infrastructure network.
- 1.14 In considering the form of network access obligations generally, our starting point is not to impose any restrictions on use or scope, and in most instances, such restrictions are unnecessary. However, PIA can be used as an upstream input into several downstream products and, in this market review, it would be inappropriate to put in place a PIA remedy for purposes which make no contribution towards remedying the competition concerns in the WLA market.
- 1.15 The current PIA remedy was designed to address this issue and allows duct and pole access to deploy broadband access networks to support both business and

residential customers, but not symmetric-speed point-to-point leased lines (typically used to support the needs of large businesses). However, our provisional view is that this use restriction has undermined the effectiveness of PIA, deterring network investment due to concerns over the ability to adjust technology choices as the market develops and exploit economies of scope in delivering different services over a shared network infrastructure. For example, a fibre network is costly to build, but once deployed has almost limitless capacity. The commercial business case for the initial investment therefore typically relies on using this capacity to generate as many different revenue streams as possible, through a wide range of different services.

- 1.16 Our provisional view is that it is appropriate to relax the current PIA usage restriction to allow 'mixed usage'. Our aim is to allow PIA to be used to deploy local access networks offering both broadband and non-broadband services, provided the purpose of the network deployment is primarily the delivery of broadband services to homes and businesses, where the inclusion of non-broadband services enables the investment. This will support the effectiveness of the PIA remedy in the WLA market.

Access on equivalent terms to ensure a level playing field

- 1.17 Ensuring other telecoms providers are on a level playing field with BT's downstream businesses is necessary to ensure the PIA remedy is effective and that competing network builders have confidence to invest in ultrafast broadband networks. In the absence of a regulatory obligation to ensure equivalent access, BT would be able to engage in practices that could distort downstream competition, including providing access but on less favourable terms compared to those obtained by its own downstream businesses.
- 1.18 If a downstream BT division (e.g. BT Consumer) were to deploy its own broadband fibre network using BT's ducts and poles, it would be required to use the PIA product, in the same way as any other telecoms provider. BT's recent agreement to reform Openreach to become a legally separate company within BT Group will strengthen the independence of Openreach from downstream BT divisions. However, BT's broadband fibre networks are currently deployed by Openreach, and so our focus is on ensuring Openreach does not have an unfair advantage over competing network builders.
- 1.19 We recognise that Openreach uses its physical infrastructure as an input to other products that Openreach itself makes available, and that PIA is not a single standard product but comprises a number of processes and sub-products. Ensuring equivalence of access to BT's ducts and poles is therefore more complex than for a single product that Openreach sells directly to BT's downstream businesses and other telecoms providers. We have sought a flexible approach which enables Openreach to retain efficiencies in providing duct access and to avoid unnecessary re-engineering of its legacy products and processes, while preventing it from disadvantaging other telecoms providers, in terms of extra cost, time or uncertainty.
- 1.20 We are proposing to impose a 'no undue discrimination' SMP condition on BT. While this condition does permit discrimination in certain circumstances, we propose to interpret the requirement as requiring strict equivalence in respect of all processes and sub-products that contribute to the supply and consumption of duct access, unless BT can demonstrate that a difference in respect of a specific process step or sub-product is justified.
- 1.21 When BT establishes new processes or platforms that contribute to the supply and consumption of duct access, these should be designed and implemented from the

outset to be equivalent; not differing from those used by other telecoms providers, other than in the most exceptional circumstances.

- 1.22 Complying with this requirement for non-discrimination would also mean that Openreach should recover costs in the same way whether it upgrades the duct and pole infrastructure to accommodate BT's network or a competitor's network.
- 1.23 We propose to support these measures through careful, continual monitoring to ensure they are effective, and create an environment in which competing providers have confidence to make very substantial capital investments relying on access to BT's duct and pole network. We are proposing requirements on BT which would allow us in the future to gather information to track performance on non-discrimination where necessary.

Processes to support efficient network deployment

- 1.24 Openreach has acknowledged the need to develop its duct and pole access processes further. Following a trial last year, it has now simplified processes in a number of areas, including reducing survey requirements and enabling telecoms providers to repair duct blockages themselves. In addition, Openreach has recently launched a new digital map which other telecoms providers can access so that the exact position of ducts, poles and chambers can be viewed online, together with an indication of available duct capacity. We welcome this as a good step forward, but consider that more needs to be done to ensure there is effective access to BT's ducts and poles.
- 1.25 We have considered what improvements are necessary to ensure the processes for PIA enable efficient deployment of rivals' broadband access networks at scale, using BT's ducts and poles. We propose that changes should be taken forwards through a requirement on BT to publish a Reference Offer in relation to the provision of PIA, setting out relevant terms and conditions. Our view is that Openreach and telecoms providers are then well placed to take forward the detailed development and practical implementation of these proposals.
- 1.26 The activities required to deploy an access network can be broadly categorised into three main stages: planning and surveying; network deployment; and connecting the customer.

Planning and surveying

- 1.27 To plan access networks using PIA, telecoms providers need access to Openreach's duct and pole network records, including detailed information on location and the extent of spare capacity available. Some degree of surveying, involving a visual inspection of the infrastructure, may also be necessary to verify if planning assumptions are accurate and whether the existing infrastructure requires work.
- 1.28 Since the publication of our initial consultation at the end of last year, Openreach's new PIA Digital Maps system has helped to address telecoms providers' need to access duct and pole network records. Openreach has also significantly reduced surveying requirements which were previously much more onerous in comparison to the processes Openreach faces itself.
- 1.29 To support the planning of large-scale access networks, we are proposing a specific requirement on BT to provide access to a duct and pole digital mapping system which should have the capacity to allow telecoms providers to download information

at sufficient scale, enabling integration with their own geographic planning tools. In addition, the current, highly manual, PIA ordering approach should be replaced by a more efficient process in a digital format, with appropriate service level agreements and guarantees. Given the importance of BT's poles for connecting prospective customers to a new access network, we also propose that telecoms providers should be able to survey poles and their available capacity more easily.

Network deployment

- 1.30 Operationally, network deployment includes build works (installing new infrastructure capacity if necessary), enabling works (for example, clearing blocked ducts) and installing the access network (for example, laying fibre optic cables).
- 1.31 For duct and pole sharing to be effective at scale, telecoms providers need to have greater certainty and confidence that they can use PIA to deploy their networks in a timely manner and without undue delays.
- 1.32 Since the publication of our initial consultation, Openreach now permits other telecoms providers to undertake their own enabling works (at their own cost) which streamlines the process by avoiding the delays associated with an iterative back-and-forth process with Openreach.
- 1.33 For enabling works, the telecoms provider already has civil engineering contractors on site. We understand Openreach's changes have helped to reduce delays. Our proposed PIA network access obligation includes requirements to ensure the existing infrastructure is 'ready for use'. Therefore, in addition to being able to undertake enabling works themselves at their own cost, we propose that telecoms providers should also have the option to recharge Openreach or request Openreach to do the work, subject to first securing Openreach's authorisation.
- 1.34 For build works, our network access obligation recognises that it may be necessary to make adjustments to address congested sections of infrastructure. Given that Openreach should maintain sufficient control over these works, and taking into account practical considerations, we propose that Openreach should have the responsibility for undertaking necessary build works, with appropriate service level agreements and guarantees. However, we propose the Reference Offer should also include a provision for telecoms providers to agree commercial terms to complete build works on behalf of Openreach.

Connecting the customer

- 1.35 The final connection between a customer's premises and the access network is known as the 'lead-in'. Around 50% of UK homes have overhead lead-ins in the form of dropwires attached to the home from poles, while the rest have underground lead-ins, either through ducts or as directly buried cable.
- 1.36 Our initial consultation put forward a proposal for 'dropwire upgrades' which would require Openreach to remove copper dropwires and to upgrade them to hybrid fibre/copper dropwires so that the fibre dropwire could be rented by a competing provider when connecting their customers.
- 1.37 Considering responses to our consultation, we observe that there are a number of ways in which lack of capacity on a pole can be addressed to support a fibre dropwire. These include: installing an additional pole; upgrading or strengthening the existing pole (e.g. by adding a stay); or upgrading the copper dropwire either with a

hybrid fibre/copper dropwire or with a hybrid copper/microtube (which would enable a telecoms provider to deploy their own fibre through the microtube at a later date).

- 1.38 We propose that BT should be subject to a simpler obligation to ensure capacity for additional dropwires is available to telecoms providers. This approach gives Openreach greater operational flexibility in determining how to provide such capacity, depending on the specific circumstances.

Pricing to support competitive investment

- 1.39 We have reviewed the pricing of PIA to ensure the remedy is effective, both in terms of access charges which support the take-up of the remedy and competitive investment, as well as ensuring competing network providers are on a level playing field with Openreach's downstream products which make use of ducts and poles. We have considered both rental and ancillary charges.
- 1.40 Rental charges for PIA are currently required to be cost oriented. However, we are concerned that this may not provide sufficient certainty as to the level of PIA rental charges in the future, potentially undermining network investment. We consider a tighter form of price regulation is likely to be appropriate. For the period under review, we propose to set a cap on rental charges, using the current methodology for calculating PIA rental charges as a starting point. We will publish our specific proposals for consultation in the summer, including our proposals on any necessary changes to reporting obligations.
- 1.41 To ensure a level playing field, we propose that the costs of setting up and managing PIA (e.g. costs associated with developing the PIA Digital Map system and PIA ordering systems) should be pooled with the equivalent costs faced by Openreach when it uses the physical infrastructure as an input to its own downstream products, and recovered from all users of the infrastructure.
- 1.42 Ancillary charges relate to a variety of activities, some of which can be avoided (e.g. by telecoms providers undertaking the relevant work themselves) and others which are likely to become less important or cease to exist due to changes resulting from our proposals and in Openreach's processes. For key ancillary charges, we propose to put in place more specific pricing obligations than the existing cost orientation requirements. In particular, for build and enabling works relating to adjustments to BT's physical infrastructure, we propose that the associated costs should be recovered from all users of the infrastructure, to reduce the barriers to competitive network investment at scale and ensure a level playing field with the charges Openreach faces itself for using its own ducts and poles. To ensure that our proposals provide sufficient certainty of the level of costs that Openreach would need to recover in this way, we propose that a financial limit should apply, with costs associated with infrastructure adjustments above this limit being recovered directly from the PIA customer.

Next steps

- 1.43 We intend to set out specific regulatory proposals for PIA pricing in the summer.
- 1.44 Following responses to this consultation, we expect to publish our final decision in a Statement in early 2018, with new measures taking effect on 1 April 2018.

Section 2

Introduction

Background to this consultation

Wholesale Local Access Market Review

- 2.1 This document forms part of our WLA market review. The market review considers the extent to which any ex ante regulation may be required in the markets for the provision of wholesale local access services in the United Kingdom from April 2018.
- 2.2 Our provisional conclusion is that BT has SMP in relation to the market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom excluding the Hull Area.¹ Following on from this, we have proposed a set of remedies to address the competition concerns that we have identified as part of our WLA market review. This document sets out our proposals to impose a specific access remedy giving other providers access to BT's duct and pole infrastructure. Our remaining remedies are set out in our WLA Market Review Consultation (the "2017 WLA MR Consultation").
- 2.3 Telecoms providers interested in deploying ultrafast broadband networks at scale have expressed concern over the high costs required to deploy new physical infrastructure (such as ducts and poles). We believe that an effective PIA remedy will reduce the absolute costs and time required for competing telecoms providers to build ultrafast networks at scale. This should encourage additional investment and new entry into the market which in turn will promote competition in the WLA and downstream markets.

History of the PIA remedy

- 2.4 The PIA remedy was originally introduced following our review of the WLA market in 2010.² The remedy required BT to allow third parties to deploy broadband networks using its physical infrastructure located in the local access network. It was primarily intended to assist telecoms providers wishing to offer fibre to the cabinet (FTTC) services in advance of BT roll-out of superfast broadband infrastructure, particularly in rural locations that were eligible for public funding support. However, the interest from competing providers to BT for these public funds, under Broadband Delivery UK (BDUK), ultimately failed to materialise.
- 2.5 We continued to impose a duct and pole access remedy following our review of the WLA market as part of our Fixed Access Market Review in 2014. In the years following the imposition of this remedy, there continued to be limited take up by telecoms providers.

¹ Ofcom, 2017. *Wholesale Local Access Market Review Consultation*, Volume 1, section 3, https://www.ofcom.org.uk/_data/assets/pdf_file/0033/99636/Vol1-Market-review.pdf

² See the 2010 WLA Statement, paragraphs 7.105 to 7.213, https://www.ofcom.org.uk/_data/assets/pdf_file/0017/33605/Review-of-the-wholesale-local-access-market.pdf

Our Strategic Review of Digital Communications

- 2.6 In February 2016, we published our Strategic Review of Digital Communications (“Strategic Review”) setting out our approach to regulating communications markets for the next decade.³ This envisaged the UK becoming a world leader in the availability and capability of its digital networks, with widespread competing networks delivering choice, innovation and affordable prices to homes and businesses. We indicated a major strategic shift to encourage investment in new ultrafast networks, particularly using fibre to the premises (FTTP) technology, as an alternative to the predominately copper-based technologies currently planned by BT. FTTP networks support advanced services, with very high speeds of 1 Gbit/s or more. They also offer greater reliability and predictability, without the ‘up to’ speed limitations of copper-based broadband services.
- 2.7 We consider that competition between different networks (including those built from scratch or built using duct and poles owned by others) is the most effective spur for innovation and continued investment in high quality, fibre networks. The analysis set out in our Strategic Review indicated that the scale of FTTP coverage tends to correlate with the level of network competition, as reflected by the extent of cable network coverage.⁴ We expect that as people and businesses enjoy greater choice of services resulting from new network deployment, competition will drive both innovation and affordable prices.
- 2.8 We therefore announced that a major area of strategic focus would be support for investment and innovation in ultrafast broadband networks by providing BT’s competitors with improved access to its duct and pole infrastructure. To support this, we noted that regulated pricing for wholesale superfast and ultrafast broadband services should ensure the incentives are there for operators to build new networks rather than relying overly on buying access from BT.
- 2.9 In response to the Strategic Review, multiple stakeholders interested in using BT’s ducts and poles argued that the existing processes associated with the PIA remedy were not fit for scale deployment of fibre networks. Several stakeholders identified that the viability of using PIA was often uncertain due to complicated processes and high upfront costs. To address the challenges faced by other telecoms providers seeking to use BT’s ducts and poles, we proposed action in five areas⁵:
- **usage restrictions:** removing usage restrictions where the PIA remedy is used to deploy broadband access networks to residential consumers at scale;
 - **equivalence of inputs:** working to apply equivalence of inputs between BT and other telecoms providers, for example, in terms of timescales, processes and terms and conditions;
 - **better information:** requiring Openreach to provide an online database of duct and pole assets so competitors can plan new networks;
 - **efficient operational processes:** ensuring operational processes are efficient, appropriately streamlined and established early; and

³ See the Strategic Review, <https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/policy/digital-comms-review/conclusions-strategic-review-digital-Communications>.

⁴ See the Strategic Review, paragraphs 4.11; see also paragraphs 4.20-4.25.

⁵ See the Strategic Review, paragraph 4.30.

- **pricing:** reviewing pricing of the PIA remedy, including ancillary service charges.

Our initial proposals to develop an effective PIA remedy

- 2.10 In July 2016 we published a progress update on how we intended to address the challenges we set out in the Strategic Review.⁶ In December we published our 2016 PIA Consultation, where we outlined our initial ideas on how to make the existing PIA remedy more effective.⁷
- 2.11 The aim of our consultation was to develop options regarding duct and pole access which may be appropriate to address any competition problems that might subsequently be identified in the WLA market review.
- 2.12 Our initial views reflected the principle that telecoms providers should not be disadvantaged compared with BT's own downstream businesses when using BT's duct and pole infrastructure to deploy ultrafast broadband services, whether in terms of the processes that a network builder faces, or the charges incurred. We discussed improved duct and pole access in three areas:
- How PIA should be used: providing greater flexibility to permit telecom providers to offer both ultrafast broadband services as well as business leased lines over a shared network;
 - How PIA should work: improving and streamlining processes for planning, network deployment, and connecting the customer (e.g. upgrading dropwires which connect BT's poles to individual houses);
 - How PIA pricing can support competitive investment: providing certainty over the level of PIA charges and recovering the costs associated with PIA in the same way BT recovers these costs for its own network deployments, e.g. by spreading them across all services which make use of the duct.

The scope of this Consultation on Duct and Pole Access remedies

- 2.13 Following on from our proposal in the 2017 WLA MR Consultation to designate BT as having SMP on the WLA market, this document develops the initial views we set out in the 2016 PIA Consultation, incorporating input provided by stakeholders in response to that consultation.⁸⁹
- 2.14 In this consultation, we put forward detailed proposals covering: the form of access to BT's ducts and poles; terms of access to support a level playing field; operational processes that support efficient network deployment; and pricing that supports competitive investment.
- 2.15 In our 2017 WLA MR Consultation we propose certain SMP conditions which are also relevant to the proposals set out in this consultation; relating to notification of

⁶ Ofcom, July 2016. *Progress update: supporting investment in ultrafast broadband networks*, https://www.ofcom.org.uk/data/assets/pdf_file/0031/68791/july_2016_progress_update.pdf.

⁷ Ofcom, December 2016. *WLA Market Review – Initial proposals to develop an effective PIA remedy*, https://www.ofcom.org.uk/data/assets/pdf_file/0024/95109/Wholesale-Local-Access-Market-Review.pdf

⁸ We received 28 responses to the 2016 PIA Consultation.

⁹ Stakeholder responses to the 2016 PIA Consultation can be found here: <https://www.ofcom.org.uk/consultations-and-statements/category-2/wholesale-local-access-market-review-proposals-PIA>

charges and terms and conditions, notification of technical information, quality of service and regulatory financial reporting. Since these conditions are proposed to apply to all forms of wholesale network access provided in the WLA market, they will also apply in respect of the PIA requirement which we are proposing in this consultation. Specifically:

- Condition 9 - notification of charges and terms and conditions: our proposals mean that the obligation proposed in the 2017 WLA MR Consultation for BT to notify changes to charges for wholesale network access products and services, and also changes to their terms and conditions, will apply to PIA;
- Condition 10 - notification of technical information: our proposals mean that the obligation proposed in the 2017 WLA MR Consultation for BT to notify technical information in advance of providing new wholesale services or amending existing technical terms and conditions will also apply to PIA;
- Condition 11 - quality of service: our proposals mean that the obligations proposed in the 2017 WLA MR Consultation for BT to comply with all such quality of service requirements and to publish all such information as to the quality of service in each case as Ofcom shall direct will also apply to PIA; and
- Condition 12: regulatory financial reporting: our proposals mean that the accounting separation and cost accounting obligations proposed in the 2017 WLA MR Consultation will also apply to PIA. We intend to set out any proposals for specific directions to the extent that they may be required for PIA in the summer.

2.16 In each case, these 2017 WLA MR Consultation proposals above should be read alongside the proposals set out in this consultation. We do not consider that anything in this consultation undermines the reasons for making those proposals and we consider that those proposals remain objectively justified, not unduly discriminatory, proportionate, and transparent for the reasons set out in the 2017 WLA MR Consultation.

2.17 More generally, the 2017 WLA MR Consultation proposes a general network access requirement for BT to give access on reasonable request, which is supported by a statement of requirements process that applies to requests for new forms of network access. While these proposals are not directly affected by the proposals set out in this consultation, if maintained, they could form the basis for a request for a different form of duct and pole network access in the future.

2.18 Given the overlap described above, Annex 8 to this consultation sets out our proposed SMP conditions in the form of a mark-up of the SMP conditions set out in the 2017 WLA MR Consultation.

Recent Developments

Access to Infrastructure Regulations

2.19 In parallel to the regulatory obligations imposed on BT as part of our market reviews, telecoms providers can also gain access to infrastructure under the Communications

(Access to Infrastructure) Regulations 2016¹⁰ (the ATI Regulations).¹¹ The ATI Regulations set out measures to reduce the cost of deploying high-speed electronic communications networks. These regulations create a series of rights and corresponding obligations designed to facilitate access to physical infrastructure across different sectors (such as electricity, water and transport services, as well as telecoms). These obligations provide the basis for commercial negotiations between infrastructure owners and access seekers. However, if parties are unable to agree, the ATI Regulations provide a dispute resolution regime under which Ofcom is the dispute resolution body. In December, we published guidance¹² on the considerations that we are likely to consider in resolving any disputes, which is intended to assist parties in reaching commercial decisions. The relevance of the ATI Regulations to addressing our competition concerns in the WLA market is outlined in paragraphs 4.5 to 4.11.

Voluntary changes to the PIA Product by Openreach

- 2.20 In our 2016 PIA Consultation, we referred to the Proof of Concept trial initiated by Openreach. As part of this trial, Openreach engaged with an industry working group to improve its PIA offering, streamlining various processes and providing telecoms providers with greater flexibility in how they deploy their network.
- 2.21 Since the beginning of the year Openreach has made several improvements to its PIA product following this trial. In January Openreach amended its PIA product so that the process changes piloted under its Proof of Concept trial became business as usual for all telecoms providers. In addition, it temporarily waived several service establishment requirements for a twelve-month period. Furthermore, Openreach announced a digital mapping system which other telecoms providers can access to view the exact position of ducts, poles and chambers online. In February Openreach also announced changes to the accreditation process, removing requirements for telecoms providers to register their accredited operatives with Openreach. These changes are discussed in further detail in paragraphs 6.4 and 6.7.

Legal Separation of Openreach

- 2.22 In March 2017, BT notified Ofcom of voluntary commitments under section 89C of the Communications Act 2003 to further reform Openreach.¹³ Under its commitments, which it will enter into upon satisfaction of certain pre-conditions, BT will incorporate a separate company, Openreach Limited, which will have control over Openreach's strategy and operations.
- 2.23 As a consequence of this notification, we have recently consulted on a proposal that BT should be released from the Undertakings that it offered to Ofcom in 2005¹⁴, under which Openreach was originally created, when the commitments enter into

¹⁰ 2016 No. 700 Electronic Communications, The Communications (Access to Infrastructure) Regulations 2016. The ATI Regulations transpose into UK law the Broadband Cost Reduction Directive 2014 ("the Directive").

¹¹ The ATI Regulations came into force on 31 July 2016.

¹² Ofcom, December 2016. *Guidance under the Communications (Access to Infrastructure) Regulations 2016*, https://www.ofcom.org.uk/_data/assets/pdf_file/0025/95191/Guidance-under-the-Communications-Access-to-Infrastructure-Regulations-2016.pdf

¹³ <http://www.btplc.com/UKDigitalFuture/Agreed/index.htm>

¹⁴ Undertakings given to Ofcom by BT pursuant to the Enterprise Act 2002, 22 September 2005, https://www.ofcom.org.uk/_data/assets/pdf_file/0021/38406/statement.pdf

force.¹⁵ Our proposals in this consultation on duct and pole access take into account the reform of Openreach under the commitments and the proposed release from the Undertakings.

Government Announcements

- 2.24 As stated in our 2016 PIA Consultation, the Government's Digital Economy Bill,¹⁶ has several measures to support the ambition for the UK to be a world leader in the digital economy. For example, one of its main elements is enabling digital infrastructure, through a reformed Electronic Communications Code, including measures to reduce the cost and simplify the roll-out of mobile and fixed broadband infrastructure; and new and simpler planning rules for building broadband infrastructure. Securing the planning rights and wayleaves to be allowed to undertake civils work and install cables is a critical part of the network build process.
- 2.25 In the 2016 Autumn Statement, the Government announced that it will invest over £1 billion by 2020/21, targeted at supporting the market to roll-out FTTP connections and future 5G communications.¹⁷ These initiatives include 100% business rates relief for new FTTP broadband infrastructure for a five-year period from 1 April 2017, designed to support roll-out to more homes and businesses. The Government subsequently launched a call for evidence seeking views on how it can best use public funding to encourage further and faster deployment of FTTP broadband networks.¹⁸ The 2017 Spring Budget set out these initiatives in further detail, confirming that the Government will allocate £200 million to fund a programme of various local projects to test ways to accelerate market delivery of new FTTP broadband networks.¹⁹

Legal Framework

- 2.26 The regulatory framework for market reviews is set out in UK legislation and is transposed from five EU Directives. These Directives impose a number of obligations on relevant regulatory authorities, including Ofcom, one of which is to carry out periodic reviews of certain electronic communications markets.²⁰
- 2.27 This market review process is carried out in three stages:
- we identify and define relevant markets;
 - we assess whether the markets are effectively competitive, which involves assessing whether any operator has SMP in any of the relevant markets; and

¹⁵ Ofcom, March 2017. *Delivering a more independent Openreach*,

https://www.ofcom.org.uk/_data/assets/pdf_file/0035/98855/Openreach-consultation-2017.pdf

¹⁶ Digital Economy Bill 2016, <https://www.gov.uk/government/collections/digital-economy-bill-2016>.

¹⁷ HM Treasury, 2016 Autumn Statement, paragraph 4.7,

<https://www.gov.uk/government/publications/autumn-statement-2016-documents/autumn-statement-2016>

¹⁸ DCMS, December 2016. *Extending Local Full Fibre Networks: Call for Evidence*,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/580726/Extending_Local_Full_Fibre_Networks_Call_for_Evidence_For_Publication_.pdf

¹⁹ HM Treasury, 2017 Spring Budget, paragraph 5.5,

<https://www.gov.uk/government/publications/spring-budget-2017-documents/spring-budget-2017>

²⁰ We set out the applicable regulatory framework and the market analysis framework in more detail in Annexes 5 and 6 of the 2017 WLA MR Consultation.

- where we find SMP, we assess the appropriate remedies, based on the nature of the competition problems identified in the relevant markets.

2.28 In carrying out the review we are required to define relevant markets appropriate to national circumstances. In so doing, we are also required to take due account of the European Commission's (EC) Recommendation on relevant product and service markets²¹ (the 2014 EC Recommendation) and SMP Guidelines²².

Relevant legal tests and statutory duties

2.29 Where we propose that a market is not effectively competitive, we identify the undertaking(s) with SMP in that market and propose what we consider to be appropriate SMP obligations. When proposing a specific SMP obligation, we need to demonstrate that the obligation in question is based on the nature of the problem identified, proportionate and justified in the light of the policy objectives as set out in Article 8 of the Framework Directive.²³

2.30 Specifically, we explain why we consider each of the conditions we are proposing satisfies the test set out in section 47 of the Communications Act 2003, namely that the obligation is:

- objectively justifiable in relation to the networks, services or facilities to which it relates;
- not such as to discriminate unduly against particular persons or against a particular description of persons;
- proportionate to what the condition or modification is intended to achieve; and
- transparent in relation to what is intended to be achieved.

2.31 Additional legal requirements also need to be satisfied depending on the SMP obligation in question. For example, when we propose a charge control, we must consider whether there is a relevant risk of adverse effects arising from price distortion; and the appropriateness of the control for the purpose of promoting efficiency; sustainable competition; and conferring the greatest possible benefits on end-users of public electronic communications services.

2.32 We also explain why we consider the performance of our general duties under section 3 of the Act would be secured or furthered by our proposed regulatory intervention. Our principal duty, in this regard, is to further the interests of citizens in relation to communications matters and customers in relevant markets, where appropriate by promoting competition. We explain why we are acting in accordance

²¹ The Wholesale local access market is Market 3a in the Commission's list of relevant markets. *Commission Recommendation of 9 October 2014 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services* (2014/710/EU), <http://eurlex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014H0710&from=EN>

²² *Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services* (2002/C 165/03), [http://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52002XC0711\(02\)&from=EN](http://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52002XC0711(02)&from=EN) (SMP Guidelines).

²³ See Article 8(4) of the Access Directive.

with the six Community requirements under section 4 of the Act. This is also relevant to our assessment of the likely impact of implementing our proposals.

- 2.33 Consistent with our duties under section 4A of the Act and under Article 3(3) of the BEREC Regulation²⁴, we have also taken due account of the applicable EC recommendations and utmost account of the applicable opinions, common positions, recommendations, guidelines, advice and regulatory best practices adopted by BEREC relevant to the matters under consideration in this consultation document.

General Impact Assessment

- 2.34 The analysis presented in this consultation represents an impact assessment, as defined in section 7 of the Communications Act 2003.

Equality impact assessment

- 2.35 Annex 7 of the 2017 WLA MR Consultation sets out our EIA for the WLA market review, of which the proposals set out in this document form part. Ofcom is required by statute to assess the potential impact of all our functions, policies, projects and practices on race, disability and gender equality. EIAs also assist us in making sure that we are meeting our principle duty of furthering the interests of citizens and consumers regardless of their background or identity.
- 2.36 It is not apparent to us that the outcome of our review is likely to have any particular impact on race, disability and gender equality. More generally, we do not envisage the impact of any outcome to be to the detriment of any group of society. Nor do we consider it necessary to carry out separate equality impact assessments in relation to race or gender equality or equality schemes under the Northern Ireland and Disability Equality Schemes.

Consultation period and next steps

- 2.37 The deadline for responses to this consultation is 15 June 2017. Annexes 1 to 4 set out the process for responding to the consultation.
- 2.38 We will publish an additional consultation in the summer which will set our proposals in relation to PIA pricing in more detail. This is discussed further in Section 7. We expect to publish our final decision in a statement in early 2018.

Document structure

- 2.39 The rest of this document is structured as follows:
- **Section 3: Approach to Remedies** – an explanation of our assessment of the WLA market and the approach taken in the designing of remedies to address the competition concerns we have;

²⁴ Body of European Regulators for Electronic Communications. See Article 3(3c) of the Framework Directive. See also Article 3(3) of the BEREC Regulation (Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators of Electronic Communications and the Office).

- **Section 4: Physical infrastructure Access Remedy** – our proposals for the access obligation, including requirements on Openreach and the scope of what access seekers may use it for;
- **Section 5: Requirement not to unduly discriminate** – our proposals for the requirement on BT to not to unduly discriminate in the supply of passive infrastructure access;
- **Section 6: Improvements to PIA process and systems** – our proposals on how to improve the operational processes for PIA, including our proposed requirement on BT to publish a Reference Offer;
- **Section 7: Price regulation of PIA** – our proposals for price regulation remedies on BT with respect to PIA.

Section 3

Approach to Remedies

WLA market and competition concerns

- 3.1 In the 2017 WLA MR Consultation we set out our assessment of market definition and market power in relation to the provision of wholesale local access. We also explain the competition concerns that we are seeking to address in this review, and how we have designed our remedies to address those competition concerns.
- 3.2 We proposed to define a market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the UK excluding the Hull Area.²⁵ Our provisional conclusion is that BT has SMP in this market.
- 3.3 We are concerned that this could lead to poor outcomes for retail customers, such as high prices for retail services that rely on wholesale local access; reduced levels of innovation and suboptimal quality of service (i.e. risk of increased faults, slow repair and provision times). As a vertically integrated provider, there are also behaviours that BT could engage in that could distort downstream competition, including: refusing to supply access at the wholesale level; and providing access, but on less favourable terms compared to those obtained by its own downstream businesses. This could further worsen consumer outcomes.
- 3.4 When considering the structure and form of our proposed remedies, we took account of our approach in previous reviews, together with recent and expected market developments. We also reflect our long-term vision for ensuring the quality and availability of communication services in the UK, as set out in our Strategic Review.
- 3.5 In developing remedies to address the competition concerns we have identified as arising from SMP in the WLA market, we have, where appropriate, adopted an approach that we consider will promote greater network competition. This reflects one of the key elements in our strategy – to make a strategic shift to encourage the large-scale deployment of new ultrafast broadband networks, including fibre direct to homes and businesses.

Greater network competition is likely to bring consumer benefits in retail services

- 3.6 We consider that there are significant benefits to consumers from competition based on rivals investing in their own networks, compared to competition based on regulated access to BT's network and services. In particular, network competition provides much greater scope for product differentiation and is a more effective spur for innovation. For example, investing in their own networks gives providers full control over the quality of service provided. Competing telecoms providers can strive to win customers and generate higher margins by offering a better service than their competitors, in terms of both speed and reliability. Network competition is therefore a powerful driver of continued investment in high quality networks, delivering long term

²⁵ We also propose to define a market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the Hull Area. We will address SMP in the Hull Area in a separate consultation document to be published in Q1 2017/18.

benefits to consumers. By exposing more of the value chain to competition, network competition also provides strong incentives for firms to innovate to become more efficient and reduce costs.²⁶

- 3.7 We recognise that network competition may entail the duplication of assets, which could put upward pressure on average costs, but believe that in this case such effects are likely to be outweighed by the significant benefits to consumers in the longer term from innovation (including innovation to increase efficiency and lower costs), choice, stronger incentives to price keenly to attract customers and higher quality of service.
- 3.8 Historically, we have seen benefits from network competition to BT. The degree of network competition from cable networks plays an important role in encouraging incumbents to deploy faster broadband.²⁷ In the early 2000s, one of the factors that drove BT to increase the performance of its initial broadband service was the availability of cable broadband. When we allowed access to local loop unbundling (LLU), we saw innovation around the electronic equipment deployed and the capacity of broadband connections. Recent research has confirmed that this policy led to faster broadband speeds.²⁸ Similarly, BT announced its roll-out of superfast broadband shortly after Virgin Media's upgrade to DOCSIS 3.0.²⁹ BT's recent announcement of G.fast investment plans was in the context of Virgin Media offering a maximum service speed of 200 Mbit/s compared to a maximum of 80 Mbit/s available from Openreach using its current FTTC network.
- 3.9 We think there are good prospects for investment in new networks. The evidence we have seen suggests that the investment case has improved in recent years to the point where it now appears to be commercially viable in more geographic areas:
- Changes in demand: customers are increasingly demanding more from their broadband access, both in terms of speed and reliability. Over the last few years, demand for higher bandwidth and consumption of broadband data have both grown significantly. For example, average household data consumption increased from 97 GB/month in 2015 to 132 GB/month in 2016.³⁰
 - Reduction in cost: costs of investment based on new duct build have fallen as a result of improvements in network build techniques.³¹
- 3.10 These developments provide a backdrop to recent significant interest in new network investment from telecoms providers other than BT:

²⁶ Without network competition, even vigorous competition between service providers will not prevent customers being disadvantaged by inefficient, poor quality or otherwise suboptimal choices concerning the underlying network.

²⁷ Strategic Review, paragraph 4.11.

²⁸ See Valletti T, 2015. *Unbundling the incumbent: evidence from UK broadband*, https://spiral.imperial.ac.uk/bitstream/10044/1/20088/2/Journal%20of%20the%20European%20Economic%20Association_13_2_2015.pdf

²⁹ Strategic Review, paragraph 4.11.

³⁰ Ofcom, 16 December 2016. *Connected Nations 2016*, paragraph 2.15, https://www.ofcom.org.uk/_data/assets/pdf_file/0035/95876/CN-Report-2016.pdf.

³¹ For example, micro-trenching and slot-trenching enables narrower digging of trenches to lay microducts which fibre can then be blown into, significantly reduced the time and cost of digging and repairing the carriageway. In addition, the move to IP networks has allowed greater economies of scope for some network equipment.

- Virgin Media, which already operates the second largest broadband network in the UK, is extending its network. Virgin Media is expanding its network and plans to reach 4 million additional premises by 2020, half of which are to be connected using FTTP.³² Virgin Media has added 314,000 premises to its network coverage in 2016, with a further 800,000 expected in 2017.³³ [3<].
 - TalkTalk and CityFibre have recently announced their intention to extend their FTTP York trial from 14,000 homes to cover a further 40,000 premises over the next 18 months.³⁴
 - A number of smaller providers are also deploying FTTP; for example, Hyperoptic, whose network reaches 100,000 UK premises, and Gigaclear, and B4RN which provide FTTP in more rural areas.
 - KCOM has rolled out FTTP to over 100,000 premises³⁵ and aims to make its FTTP product 'Lightstream' available to 150,000 premises by the end of 2017.³⁶
- 3.11 BT itself has announced its ambition to reach 12 million homes and businesses with faster broadband services by 2020, through a mix of 2 million premises with FTTP and 10 million premises with G.fast technology.³⁷
- 3.12 We are at an important juncture in the development of the networks that will serve the needs of the UK in the future. In particular, network competition would make the decisions about how to serve the needs of customers in the future contestable. Instead of being constrained by BT's chosen strategy of incrementally upgrading its existing copper network, competing telecoms providers have the opportunity to build their own ultrafast networks, such as FTTP.
- 3.13 Allowing telecoms providers to respond to the prospect of BT's investment by themselves investing in competing networks will help ensure that the investment decisions serve the needs of customers. In particular, we observe that under BT's current plans, the majority of the 12 million homes and businesses will receive higher speed broadband via FTTC. Although this may meet customers' bandwidth needs in the medium term, there may be limited scope for improvements to the copper network beyond this should bandwidth demand increase further. Moreover, the speeds that can be reached also deteriorate over distance so the highest headline speeds may not be available to all customers in an area. FTTP networks can also be more reliable and experience fewer faults than services based fully or partially on the

³² Virgin Media, 2017. *Project Lightning: Supercharging the UK*.

<http://www.virginmedia.com/corporate/about-us/our-key-projects.html> [accessed 01 February 2017]. Note, FTTP may also be referred as FTTH or full-fibre.

³³ Liberty Global, 2017. *Fiscal 2016 Fixed Income Release* (as amended 28 March 2017).

<http://www.libertyglobal.com/pdf/press-release/UPC-Fixed-Income-Release-Q4-2016-FINAL-AMENDED.pdf> [accessed 3 April 2017].

³⁴ TalkTalk, 25th October 2016. *Ultra Fibre Optic Trial set to cover the whole of York*, <https://www.talktalkgroup.com/articles/talktalkgroup/2016/October/Ultra-Fibre-Optic-Trial-set-to-cover-the-whole-of-York>.

³⁵ KCOM plc, 30 September 2016, KCOM announces major milestone in ultrafast broadband rollout, <http://www.kcomplc.com/business-insight/news-and-media/kcom-announces-major-milestone-in-ultrafast-broadband-rollout/> [accessed 6 February 2017].

³⁶ KCOM home, <https://www.kcomhome.com/products/broadband/lightstream/>, [accessed 6 February 2017].

³⁷ BT Group plc, November and December 2016. *Q2 2016/17 results – investor meeting slide pack*, <http://www.btplc.com/Sharesandperformance/Quarterlyresults/Investormeetingpack.pdf>.

traditional copper-based telephone networks. For example, in Hull, [38]. We know from our Quality of Service research that customers “simply want and expect the service to work” and place a high value on reliability and not having to be concerned that bandwidth may be a constraint.³⁸

- 3.14 We note that increased investment in FTTP also has the potential to deliver significant economic benefits. A recently published European Commission (EC) Staff Working Document notes that Very High Capacity (VHC) networks will enable the use of the best products, services and applications and to provide the best service to European citizens.³⁹ This in turn, creates a market for such online services.
- 3.15 The EC impact assessment also notes the potential for VHC networks, including those based on FTTP, to deliver disruptive change through innovation.⁴⁰ It claims that better connectivity will allow all sectors of the economy to realise higher productivity, and may give a significant boost to innovation, including through supporting the development and use of the ‘Internet of Things’. Similarly, a report by Arthur D Little on behalf of Vodafone has identified a broad range of industries that it argues would benefit from gigabit networks, such as healthcare and education.⁴¹

Duct and pole access remedies

- 3.16 A key element of our proposals to promote greater network competition is the imposition of a specific access remedy giving other providers access to BT’s duct and pole infrastructure. The remainder of this document sets out our proposals for this remedy. We also propose remedies to complement the specific access remedy, namely a non-discrimination remedy and a requirement to publish a Reference Offer.
- 3.17 We also propose to impose rules on financial reporting and cost accounting, as well as price controls, but will consult on the detail of these remedies in summer 2017.

³⁸ Jigsaw research, February 2016. *Quality of Service in Telecoms*, section 4.1, https://www.ofcom.org.uk/_data/assets/pdf_file/0025/78370/jigsaw_quality_of_service_in_telecoms.pdf.

³⁹ European Commission, 14 September 2016. *Commission staff working document accompanying the document communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*, section 4.3.1, <http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52016SC0300>.

⁴⁰ European Commission, 2016. *Impact Assessment of Review of the regulatory framework for electronic communications*, part 3/3, pages 328–329, http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=17193

⁴¹ Arthur D Little, 2016. *Creating a Gigabit Society*, page 5, http://www.vodafone.com/content/dam/group/policy/downloads/Vodafone_Group_Call_for_the_Gigabit_SocietyFV.pdf. For example, fibre networks could be used to provide digital health services such as remote patient monitoring and remote care & rehabilitation. In education, fibre networks could support increased digitisation within the classroom (e.g. to download content on tablets or laptops).

Section 4

Physical infrastructure access remedy

Introduction

- 4.1 In this section, we set out our proposal to impose a network access obligation on BT requiring it to provide access to its physical infrastructure. We explain why such a requirement is necessary. We then set out our view on the scope of the access obligation, in terms of:
- the extent to which the proposed PIA obligation requires BT to make adjustments to its infrastructure network to relieve congested physical infrastructure, including the repair of existing faulty infrastructure and the construction of new physical infrastructure; and
 - the scope of the remedy, both in terms of allowed uses of the remedy and the geographic scope of the remedy.

Aim and effect of the regulation

- 4.2 As explained in Section 3 above, we consider that there are significant benefits to consumers from competition based on rivals investing in their own networks, compared to competition based on regulated access to BT's network and services. We see this approach as key to promoting effective competition in the WLA market.
- 4.3 However, the high costs of deploying physical infrastructure, such as ducts and poles, remains a barrier to large-scale network deployment in significant parts of the country. These costs constitute a large proportion of the overall capital expenditure of an access network, typically of the order of 50% to 70%.⁴² Reusing existing underground ducts can also reduce the time it takes to deploy a new network: whereas in some cases it can take days to build 200m of duct using traditional construction methods, fibre cables could be installed in the same length of existing duct in a matter of hours.⁴³ BT has an extensive physical infrastructure network that reaches most homes and businesses in the UK and BT's ability to reuse this legacy infrastructure, much of which predates market liberalisation, gives it a significant advantage over its competitors. Without access to BT's physical infrastructure network, large-scale network deployment in significant parts of the country is unviable.
- 4.4 Given our provisional conclusion that BT has SMP in this market, it is likely that BT would have the incentive and ability to favour its own downstream businesses over rivals in the relevant downstream markets, distorting competition in these markets, which is ultimately against the interests of consumers. Therefore, in the absence of a requirement to provide PIA, BT could refuse access to its physical infrastructure, or it could provide access to its physical infrastructure on less favourable terms and conditions compared to those obtained by its own downstream businesses.

⁴² 2010 WLA Statement, paragraph 7.1

⁴³ DCMS, November 2011. *Microtrenching and Street Works: An advice note for Local Authorities and Communications Providers*, paragraph 2.11, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/77427/Microtrenching_guidance_NOV2011.pdf

The ATI Regulations do not address our competition concerns

- 4.5 The ATI Regulations set out measures intended to reduce the cost of deploying high-speed electronic communications networks. These measures include sharing physical infrastructure of telecoms network providers as well as physical infrastructure across different sectors (such as electricity, water and transport services). Among others, the ATI Regulations provide for a network provider to access such infrastructure on fair and reasonable terms for the purposes of deploying elements of a high-speed electronic communications network.
- 4.6 We have considered whether the ATI Regulations address our competition concerns sufficiently such that it would be unnecessary to impose a duct and pole access remedy on BT. We do not think this is the case for the following reasons.
- 4.7 The ATI Regulations are conceived as a means of facilitating commercial agreements for access on fair and reasonable terms, with dispute resolution by ourselves in the event no agreement can be reached. Consequently, they do not provide for a fully specified PIA remedy of the type that we consider is necessary to impose in the context of this market as a remedy for BT's SMP.
- 4.8 Although access seekers can refer disputes to ourselves under the ATI Regulations, the lack of certainty in an ex post dispute resolution process is likely to act as a barrier to relying on this as the means to access BT's physical infrastructure to deploy a network at scale. Indeed, in our consultation on guidance under the ATI Regulations, some stakeholders expressed concerns that the ATI Regulations would not be an effective substitute for SMP regulation and have expressed concern about the effectiveness of ex post dispute resolution processes established under the ATI Regulations, particularly in comparison with ex ante regulation under the European Framework.⁴⁴
- 4.9 There are also areas where the rights and obligations established in the ATI Regulations may not be sufficient to encourage network deployment at scale based on access to BT's physical infrastructure. For example:
- Although the ATI Regulations enable telecoms providers to obtain existing information held about the infrastructure, the regulations do not specify the format in which that information should be provided. As explained in Section 6, we consider that it is important that network records should be provided to telecoms providers in a digital format that is able to be integrated into telecoms providers' geographic network planning tools, such that they can effectively plan their network deployments at scale. Under the ATI Regulations, telecoms providers would be dependent on BT voluntarily doing this.
 - The ATI Regulations do not specify the operational processes or detailed timescales for interacting with the infrastructure operator at the different stages of an access network deployment. We consider that telecoms providers need certainty and confidence around the operational processes and timescales if they are to rely on infrastructure sharing to deploy a network at scale. Some of the issues identified with the existing processes under the current PIA remedy serve

⁴⁴ These views were shared with us when we consulted on our guidance under the ATI Regulations. See Statement following consultation on Guidance under the ATI Regulations, paragraph 1.8, https://www.ofcom.org.uk/_data/assets/pdf_file/0026/95192/Statement-following-consultation-on-Guidance-under-the-Communications-Access-to-Infrastructure-Regulations-2016.pdf

to highlight the importance of being able to impose specific obligations related to these areas.

- There is significant uncertainty as to the prices that will be charged for access. Under the ATI Regulations, there is a range of factors which we must consider in resolving a dispute, and the precise approach will depend on the specific circumstances of each dispute.⁴⁵ In principle, a range of prices and pricing approaches might satisfy the considerations we are required to take into account.⁴⁶ Moreover, given the differences between the framework for determining prices in resolving disputes under the ATI Regulations and the framework for setting a price under SMP regulation, it may be that the respective prices would differ significantly.
- The ATI Regulations do not include any explicit obligations to prevent vertically integrated infrastructure operators from discriminating between their own downstream businesses and rival access seekers when providing access.⁴⁷ Without confidence that a level playing field will be maintained these potential competitors are unlikely to invest at scale.

4.10 Therefore, we do not consider that the ATI Regulations address effectively the competition concerns arising from BT's market power. We consider that achieving effective competition in the context of the WLA market requires robust SMP regulation in the form of a fully specified access remedy. Indeed, the challenges faced by other telecoms providers in using BT's ducts and poles under the existing PIA remedy serve to highlight this.

4.11 Moreover, the ability to access other (i.e. non-BT) infrastructure under the ATI Regulations does not sufficiently address our competition concerns arising from BT's market power. Although other infrastructure operators may not have the same incentive as BT to refuse access or provide access on unfavourable terms, many of the issues above still apply. We also understand that the greatest interest for broadband deployment remains in using BT's duct and pole infrastructure, which is perhaps unsurprising given the ubiquity of the BT infrastructure network and the fact that it was purpose-built to deploy a telecommunications network.

We are proposing to impose a specific access remedy

4.12 In light of the above, we are proposing to impose a specific network access remedy in the form of PIA, which would require BT to allow other telecoms providers to deploy their own networks in BT's underground ducts and chambers or overhead on its telegraph poles. We believe that an effective PIA remedy will reduce the absolute costs and time required to build ultrafast broadband networks at scale. This is a key factor in helping to promote competition and investment in rival networks. We believe that this will help make network competition at scale viable. In our view, an effective PIA remedy will, in due course, result in downstream services becoming potentially competitive in many geographic areas.

⁴⁵ See Guidance under the Communications (Access to Infrastructure) Regulations 2016, paragraphs 5.13 – 5.29.

⁴⁶ See Guidance under the Communications (Access to Infrastructure) Regulations 2016, footnote 20

⁴⁷ Under the ATI Regulations, access must be provided on fair and reasonable terms (Regulation 6(2)). Information about physical infrastructure must be made available on proportionate, non-discriminatory and transparent terms (Regulation 4(3)).

- 4.13 The remedy will also require BT to provide any ancillary services as may be reasonably necessary to enable and support the provision of PIA. Ancillary Services are those services that are reasonably necessary to enable the use of PIA, for example: power; access to BT's exchanges; and a database containing detailed network records of BT's duct and pole infrastructure. These are considered at the end of this section.

Relieving congested physical infrastructure

- 4.14 The current PIA remedy requires Openreach to set out, in a Reference Offer, arrangements for relieving congested physical infrastructure, including the repair of existing faulty infrastructure and the construction of new physical infrastructure.
- 4.15 Under the current Reference Offer, Openreach offers services to allow certain work to be undertaken, including the recovery of redundant cables, the repair of existing faulty infrastructure (e.g. blockage clearance, replacement ducts, chambers or poles) and the construction of new physical infrastructure where the existing capacity is insufficient. Any work is currently funded via upfront charges to the telecoms provider requesting the work, and any resulting new infrastructure which is built is owned and maintained by BT and incorporated into BT's infrastructure access network.

2016 PIA Consultation

- 4.16 In the 2016 PIA Consultation, we considered that an effective PIA remedy should include a requirement on Openreach to make adjustments to its network to relieve congested physical infrastructure. Although a telecoms provider may be able to build its own infrastructure to bypass congested infrastructure, the inefficiency introduced may render the deployment unviable, and therefore the PIA remedy ineffective.
- 4.17 We explained that this requirement should be limited and invited views on how the obligation could be bounded. We drew a distinction between incremental augmentations to the existing infrastructure which are likely to be necessary, and more extensive requests which appear to be about extending the network rather than making use of existing network assets.
- 4.18 We also distinguished between lead-ins – the final connection between a customer premises and the final distribution point in the access network – and the rest of the physical infrastructure network on the basis that lead-ins have unique characteristics. In general, the lead-in is usually associated solely with a single premises and the physical infrastructure is more likely to have been designed without allowance for spare capacity, presenting constraints that could hinder competitive network deployment.
- 4.19 Around 50% of UK premises have overhead lead-ins in the form of dropwires attached to the premises from poles, while the rest have underground lead-ins, either through ducts or as directly buried cable. Given the specific constraints that exist for overhead lead-ins, our view was that it may be appropriate to consider different regulatory approaches to overhead and underground lead-ins:
- 4.19.1 With respect to overhead lead-ins, even if a telecoms provider can request Openreach to provide additional pole capacity, the specific issues that arise may still present a material barrier to the effective use of poles for overhead lead-ins. We invited views on an alternative approach where a telecoms provider could access BT's dropwires with Openreach responsible for

upgrading the existing copper dropwire to a hybrid fibre/copper dropwire at the request of the telecoms provider.

- 4.19.2 For underground lead-ins, we considered that where duct is available and has sufficient capacity to deploy additional or new fibre, Openreach should offer access to this infrastructure, with the same arrangements for enabling works as in other parts of the duct infrastructure. However, where there is no duct or the duct is too small to accommodate an additional cable, our view was that the telecoms provider should deploy its own infrastructure for its own lead-in.

Stakeholder responses to the 2016 PIA Consultation

- 4.20 All stakeholders agreed with the principle that Openreach should be required to make some adjustments to the physical infrastructure to facilitate access and ensure the remedy is effective. Most stakeholders agreed that if Openreach is not required to make adjustments to the network to relieve congested physical infrastructure, then network deployments will potentially become inefficient and costly, undermining the viability of the deployment. However, Openreach stated that short stretches of congested duct cannot be obstacles to a scale deployment of an ultrafast network because they happen infrequently.⁴⁸
- 4.21 There were a range of views as to the extent of the adjustments Openreach should be required to make. Most stakeholders thought that Openreach should be required to repair existing faulty infrastructure and some stakeholders thought that its obligations should extend to include the construction of new infrastructure in areas that Openreach already serves. Most stakeholders agreed that it should not include the provision of infrastructure to areas unserved by Openreach. Openreach argued that any extension of the PIA obligation which moves beyond unbundling of an existing asset and into new asset construction is unjustified and disproportionate as it should not be obligated to build a new duct network.

Our Proposals

- 4.22 As explained above, we are proposing to impose an obligation on BT to provide network access in the form of PIA. The concept of network access includes making adjustments in order to make available to another undertaking facilities and/or services for the purpose of providing electronic communications services. In developing our network access proposals, we have assessed what level of adjustment is appropriate and proportionate to achieve this in the context of BT's SMP in this market. Specifically, we consider below the extent of this obligation where BT's physical infrastructure network is congested.

Openreach should be required to relieve congested sections of physical infrastructure

- 4.23 Telecoms providers using PIA to deploy a competing network will on occasion encounter sections of infrastructure which they cannot use, either because the existing infrastructure is faulty or because there is insufficient capacity in that section. We consider that Openreach should adjust the physical infrastructure network to make it available for use. Absent such a requirement, telecoms providers would need to circumvent any congested sections of infrastructure themselves by building their own parallel physical infrastructure. This would introduce additional costs and delay,

⁴⁸ Openreach response to the 2016 PIA Consultation, paragraph 204

which together with not having certainty over the full extent of works required until deployment of the network actually commences, is likely to deter telecoms providers from investing in competing networks at scale. Below, we explain why we consider this to be the case.

- 4.24 Our rationale for requiring BT to provide network access in the form of PIA is to promote competition by facilitating third party investment in competing infrastructure. We consider that the efficiencies arising out of deploying a network using PIA, instead of building a new physical infrastructure network, will facilitate investment which would not otherwise be viable.
- 4.25 Our own surveys of BT's physical infrastructure, as well as more recent surveys carried out by other telecoms providers with a view to using PIA, indicate that congested sections of infrastructure will be encountered on occasion when deploying a rival access network. As a result, it will be necessary to overcome these congested sections in order to deploy a network using PIA. For example:
- 4.25.1 We commissioned two sample surveys of BT's physical infrastructure access network, in 2008 and 2009. These found that there was a significant amount of unoccupied capacity in the access network ducts, chambers and poles surveyed.⁴⁹ However, in most routes surveyed there were congested sections of duct. For example, the 2009 survey analysed the end-to-end capacity availability of 17 routes and only three of these achieved a "pass" at all infrastructure sections.⁵⁰ In addition, not all the space observed at the ends of ducts would be usable for installing new cables, for example due to obstacles that could not be observed by the surveyors such as collapsed ducts and kinked cables.⁵¹ The 2009 survey also showed that not all poles that deliver overhead lead-ins to end customers have capacity to accommodate the additional dropwires that might be required by a rival network: 15% of the poles surveyed could not accommodate any additional dropwires, and 37% of the poles surveyed could not accommodate double the amount of wires currently installed. Finally, the surveys also revealed several operational issues that would have to be overcome to make use of BT's physical infrastructure: for example, some chambers had become entirely filled with earth due to the rain washing the earth into the chambers, or trees obstructing poles affecting overhead deployment.
- 4.25.2 Flomatik carried out a sample survey of BT's ducts and poles in King's Lynn in 2016. The pole survey looked at 49 poles and found that most poles could accommodate at least double the amount of wires currently installed. However, six poles could not and two of these could not

⁴⁹ The 2008 survey observed duct availability along contiguous routes between a BT 'metro node' and a 'last cabinet' before the customer premises (Analysys Mason, 2008. *Telecoms infrastructure access - sample survey of duct access*). The 2009 survey observed availability of duct and pole infrastructure from the street cabinet to the customer premises (Analysys Mason, 15 January 2010. *Sample survey of ducts and poles in the UK access network*).

⁵⁰ Ofcom, 2010. *Review of the wholesale local access market*, paragraph 7.125-7.126. Our analysis has shown that on average there is a 70% to 80% likelihood of a section of infrastructure having unoccupied space that could potentially accommodate a new cable; on a typical route of 10 chambers, there is likely to be two or three pinch points. Some routes will be completely free of pinch points, but other routes may contain several pinch points.

⁵¹ See the 2010 WLA Statement, paragraph 7.127.

accommodate even an additional increment of half the amount of wires currently installed.⁵² [§<]⁵³

- 4.25.3 Openreach's own estimates of duct occupancy based on duct and cable records indicate that 10% of duct sections are over 70% full and 16% of duct sections are over 50% full.⁵⁴ Moreover, in its own Next Generation Access (NGA) deployment business modelling, Openreach implicitly assumes that it will encounter 2.23 duct blockages per kilometre.⁵⁵ With respect to poles, Openreach does not hold comprehensive information on pole capacity or availability. However, information from a 2011 study of the pole population showed that, at the time, around 5% of poles could not be climbed due to decay damage or other reasons.^{56 57}
- 4.26 The absence of viable ways to circumvent the congested section of infrastructure could prevent a telecoms provider gaining the efficiency benefits from sharing BT's infrastructure over a much wider area.⁵⁸
- 4.27 One approach would be for telecoms providers to install their own ducts or poles alongside BT's, to bypass the congested sections in the BT infrastructure network. Another approach would be for Openreach to relieve the congested sections in BT's infrastructure.
- 4.28 We remain of the view that the remedy will be ineffective unless Openreach is required to relieve the congested sections in its own infrastructure. This is because the alternative approach would be for a telecoms provider to install its own infrastructure to bypass the congested sections. This would introduce additional cost, time and operational complexity, to the point that it may render the deployment unviable, and therefore the PIA remedy ineffective in encouraging investment in large scale competing local access networks. Therefore, given the range of options available to Openreach, it will generally be more efficient for Openreach to relieve congested sections for the reasons set out below:
- Openreach is likely to be able to repair or unblock existing faulty infrastructure at lower cost than the cost of building parallel infrastructure. For example, a collapsed duct can be repaired with a duct repair kit, rather than installing a whole section of new duct between the two chambers.
 - In some circumstances, Openreach may be able to provide additional capacity without the need for costly civil works to install new infrastructure (e.g. by

⁵² See Flomatik's response to the 2016 PIA Consultation, page 6. Also, see Flomatik's response to s135 dated March 2017, Question 1.

⁵³ [§<]

⁵⁴ Openreach response to s135 dated 6 March 2017, Question 22. Openreach has informed us that these estimates are national average figures and the accuracy of estimates and local occupancy levels vary widely between different geographic locations.

⁵⁵ Figure is based on the NGA cost model assumptions used in December 2016. Openreach response to s135 dated 6 March 2017, Question 25. See also Openreach response to s135 dated 6 March 2017, Question 28.

⁵⁶ Openreach response to s135 dated 6 March 2017, Question 9.

⁵⁷ In its response to s135 dated 6 March 2017, Question 10, Openreach confirmed it does not have comprehensive data on pole capacity. However, in a study carried out by Openreach it estimated that 7% of the current pole estate may already be at maximum capacity.

⁵⁸ In some circumstances, it may be possible to avoid a congested section of physical infrastructure by re-routing the network.

removing redundant cables or, in the case of poles, strengthening the existing pole by adding a stay).

- Where Openreach would need to install new infrastructure, it is likely to be able to install this at lower cost than a telecoms provider can build parallel infrastructure. For example, when a telecoms provider installs parallel duct to bypass congested sections, engineering best practice requires the installation of chambers at either end of the duct runs, making this approach more expensive than Openreach providing ducts which would be connected directly to the existing chambers.⁵⁹
- It is likely to be more operationally complex and time-consuming for telecoms providers to build parallel infrastructure than for Openreach to repair or augment existing infrastructure. Openreach will generally be in a better position in terms of obtaining any necessary permissions or access for any works relating to infrastructure which is already present (for example, Openreach will already have the necessary wayleaves). Openreach will also have more certainty about the viability of adding capacity to an existing route (e.g. immediately alongside existing duct), whereas a competing telecoms provider may need to build new bypass duct infrastructure, identifying and avoiding obstacles, such as the infrastructure of other utilities operators.
- Telecoms providers maintaining short sections of non-contiguous infrastructure may face higher costs and coordination issues with Openreach, than if it were part of a national infrastructure network.⁶⁰ The opportunity to further monetise any unused capacity in these short sections of infrastructure, by providing access to other telecoms providers, is also likely to be limited.

4.29 Moreover, requiring telecoms providers to install their own infrastructure to bypass the congested sections would not ensure a level playing field with Openreach as, for the reasons above, Openreach could overcome congested sections of infrastructure at lower cost in any further network deployment of its own. Knowing that Openreach has this competitive advantage could undermine incentives to invest in network deployment in the first place, rendering the PIA remedy ineffective.

4.30 Therefore, we consider that the PIA access remedy should include a requirement on Openreach to make certain adjustments to its network to relieve congested physical infrastructure. Without such a requirement, the benefits resulting from other telecoms providers deploying ultrafast networks at scale are unlikely to be realised in full or at all.

The requirement to relieve congested infrastructure is limited

4.31 We are proposing that the PIA network access obligation should extend to requiring Openreach to make adjustments to its network where this is necessary for its physical infrastructure network to be available to telecoms providers for the purpose of deploying their own networks. We have considered the approach we should take to specifying this obligation.

4.32 We have considered whether we should specify the precise extent of this obligation in our proposed SMP condition. However, we are concerned that doing so would lead

⁵⁹ This may also not be possible if there is insufficient space for the construction of additional chambers, for example, due to other buried utilities.

⁶⁰ For example, network monitoring systems would be required for both fibre housed in BT's ducts and in a telecoms providers own ducts,

to a risk of regulatory failure given that what is necessary is likely to depend on the specific circumstances of any case.

- 4.33 Instead, we are proposing to maintain the general network access requirement but supplement this with guidance on where this obligation would apply. While this approach allows Openreach some degree of flexibility, we are concerned to ensure that Openreach does not act unreasonably. Therefore, we consider that where Openreach refuses a request for network access, Openreach should provide reasons for doing so. Furthermore, if it becomes apparent that this approach is not working, we will reconsider whether it is appropriate to adopt a more prescriptive approach.
- 4.34 Our proposed guidance is set out below. In formulating this guidance on the scope of the network access obligation we are imposing, we have taken into account the factors set out in section 87(4) of the Act, in particular:
- the technical and economic viability (including the viability of other network access products, whether provided by the dominant provider or another person), having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;
 - the feasibility of the provision of the proposed network access;
 - the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed (taking account of any public investment made);⁶¹
 - the need to secure effective competition (including, where it appears to us to be appropriate, economically efficient infrastructure based competition) in the long term.
- 4.35 In what follows, we consider how these factors might apply to the following examples to illustrate the situations where we would expect the obligation applies, and situations where it does not:⁶²
- existing physical infrastructure which is blocked or damaged;
 - insufficient capacity up to the final distribution point;
 - insufficient capacity in underground lead-in ducts;
 - insufficient capacity on distribution poles (for overhead lead-ins); and
 - extension of the existing network footprint.

Example 1: existing physical infrastructure which is blocked or damaged

- 4.36 Works to repair or unblock existing unusable infrastructure are clearly necessary to allow anyone to use the infrastructure. Further, it is highly likely that in most cases Openreach will be able to repair or unblock the existing infrastructure for considerably less than the cost to a competing telecoms provider of building parallel

⁶¹ Consideration of this factor depends on our approach to the recovery of these costs, set out in Section 7. We have taken account of that analysis in the guidance we give here.

⁶² For the avoidance of doubt, these examples are not intended to be exhaustive. We also make some observations relevant to these examples in the context of process in Section 6.

infrastructure to bypass the congested section, making the latter an unviable alternative. Therefore, in general, we would expect Openreach to repair or unblock existing infrastructure.

- 4.37 One likely exception to this concerns underground lead-ins.⁶³ Where these ducts have sufficient capacity to deploy an additional cable but are blocked or damaged, we understand that it may not be practicable or economic to repair the existing duct, and a new lead-in duct is Openreach's preferred solution.⁶⁴ Competing telecoms providers may also prefer to adopt a different, lower cost solution to providing lead-ins, for example, running the lead-in above ground.⁶⁵ In these circumstances, there is no obvious benefit to requiring Openreach to install a new lead-in compared to competing telecoms providers building their own infrastructure. However, it may be necessary for Openreach to install a footway box outside the property so that the competing telecoms provider can make use of any spine duct passing the property and leading back to the distribution point.⁶⁶

Example 2: insufficient capacity up to the final distribution point

- 4.38 Where there is insufficient capacity in physical infrastructure up to the final distribution point (i.e. in spine duct or chambers, or on feeder poles⁶⁷), it will be necessary to consider whether what is being requested in any particular case is necessary for Openreach to make its physical infrastructure network available. This recognises that although it can be more efficient for Openreach to make additional capacity available, it should only be required to do so where this is a genuine augmentation to its infrastructure network, rather than installing infrastructure that another telecoms provider could equally install itself. In assessing what should be required in any given situation, we consider that the following two factors are likely to be relevant:

⁶³ The final connection between a customer's premises and the access network deployed by the telecoms provider is known as the 'lead-in'. Around 50% of UK homes have overhead lead-ins in the form of dropwires attached to the home from poles, while the other 50% have underground lead-ins, either through ducts or as directly buried cable.

⁶⁴ [3<]

⁶⁵ Openreach's engineering rules require lead-ins to be buried in duct at a certain depth all the way to the edge of the property. However, some customers may be reluctant to grant permission to install an underground lead-in where this is likely to result in damage to the surface at the front of their property (e.g. block paving).

⁶⁶ The requirement for Openreach to install a footway box to provide access to spine duct is, like other adjustments, limited. For example, if multiple footway boxes are required to service a row of houses, all of which have direct buried lead-ins, it is less likely to be necessary for Openreach to provide these. This is because some of the disadvantages that telecoms providers face if they are required to build their own parallel infrastructure (in terms of cost, operational complexity and time) may diminish as the number of continuous premises served by the new parallel infrastructure increases.

⁶⁷ Aside from lead-ins, most of the access network is underground, with the use of poles becoming more common as the network gets closer to the customer. From the exchange to the cabinet, less than 1% of the network is carried overhead (on feeder poles), whereas between the cabinet and final distribution point, this figure increases to around 12%. Although BT generally uses ducts in its underground access network, a minority of routes, mainly between cabinets and distribution points, have been buried directly in the ground without ducts. See Ofcom, March 2009, *Delivering super-fast broadband in the UK*, paragraph 7.16,

https://www.ofcom.org.uk/_data/assets/pdf_file/0018/59121/statement.pdf and the 2010 WLA Consultation, paragraph 7.128, https://www.ofcom.org.uk/_data/assets/pdf_file/0017/33605/Review-of-the-wholesale-local-access-market-.pdf

- First, the more additional capacity required, the less likely it will be necessary for Openreach to provide this. This is for the following reason. As the amount of additional capacity sought increases relative to the total capacity in that section of the existing infrastructure, the work required to provide that capacity is increasingly likely to resemble the construction of new parallel physical infrastructure, rather than the augmentation of the existing infrastructure. For example, large amounts of new capacity are less likely to make use of the existing chambers.
- Second, the greater the length of additional duct capacity required, the less likely it will be necessary for Openreach to provide this. This is because some of the cost, operational complexity and timing disadvantages faced by other telecoms providers (relative to Openreach) in overcoming a capacity constraint may diminish as the length of the congested section increases.⁶⁸ Therefore, it is more likely to be necessary for Openreach to provide additional capacity to overcome short sections of duct which are capacity constrained (i.e. 'pinch points' in a longer run of ducts where the majority of sections have capacity available), than over longer sections of capacity constrained duct.

4.39 Moreover, we recognise that in some cases there may be issues beyond Openreach's control which prevent it from being able to provide additional capacity, for example, wayleave issues.

Example 3: insufficient capacity in underground lead-in ducts

4.40 We understand that most homes in the UK are served via overhead lead-ins or ducted lead-ins where there is sufficient capacity for at least some additional fibre.⁶⁹ However, some homes are served by lead-ins which are either directly buried (i.e. there is no existing duct available) or installed in ducts which are too small to accommodate an additional cable. Where this is the case, it is likely that the only way to provide additional capacity is to install a new underground lead-in duct. As discussed above, competing telecoms providers may also prefer to adopt a different, lower cost solution to providing lead-ins, for example, running the lead-in above ground. Moreover, Openreach has no obvious advantage in installing a new lead-in compared to competing telecoms providers building their own infrastructure. Therefore, we do not think it is necessary for Openreach to relieve congestion in this situation. However, it may be necessary for Openreach to install a footway box

⁶⁸ This may not be the case where Openreach can provide additional capacity without needing to install new infrastructure. For example, if Openreach can provide additional capacity by removing redundant cables, this may be more efficient even over long distances.

⁶⁹ Around 50% of UK homes have overhead lead-ins in the form of dropwires attached to the home from poles, while the rest have underground lead-ins, either through ducts or as directly buried cable. BT has previously told us that it estimates that between 5% to 10% of lead-ins may be served by cables that are directly buried in the ground without ducts. For ducted lead-ins, we understand that most of these are 50mm diameter ducts and the majority (80%) of the cables in the 50mm lead-in duct are less than 15mm in diameter, leaving significant space within the duct. Smaller 25mm ducts may also be present in some parts of the BT network deployed before 1968, with little unoccupied capacity for additional cables. 2010 WLA market review consultation, paragraph 7.128 and Sample survey of ducts and poles in the UK access network, Analysys Mason, pages 1-3. In its response to our information request of 6 March 2017, BT has confirmed that it does not know the total number of directly buried lead-ins, but provided a rough estimate that approx. 5% of lead-ins may be directly-buried. This varies by region, between 1% in London and 8-10% in Southern England.

outside the property so that the competing telecoms provider can make use of any spine duct passing the property and leading back to the distribution point.

Example 4: insufficient capacity on distribution poles (for overhead lead-ins)

- 4.41 In contrast to underground lead-in ducts, we consider it very likely that Openreach will be able to provide additional capacity on distribution poles (i.e. poles used for overhead dropwires) more efficiently than a competing telecoms provider which would likely need to build parallel infrastructure.⁷⁰ There are several options available to Openreach to make additional capacity available where the existing pole is capacity constrained, most of which cost considerably less, and are much simpler and quicker to implement, than the alternatives available to a competing telecoms provider.⁷¹ This is particularly the case if Openreach chooses an option which makes use of the existing pole (e.g. adding a stay, or removing / replacing dropwires). The alternatives available to competing telecoms providers include installing their own pole (although this may face opposition from residents), or the costliest option, installing ducts for underground lead-ins.⁷² These alternatives are likely to be far more costly than the much lower cost and lower risk options available to Openreach. Therefore, we think it is necessary for Openreach to relieve congestion on capacity constrained distribution poles.

Example 5: extension of the existing network footprint

- 4.42 We do not consider that Openreach should be required to construct new physical infrastructure for rival telecoms providers in geographic locations where it does not already have infrastructure (i.e. outside its network footprint).⁷³ This amounts to an extension of the infrastructure network rather than making use of existing infrastructure assets and will therefore always fall outside the scope of a network access obligation; such an adjustment will almost always not be necessary for a telecoms provider to make use of the existing infrastructure network. Moreover, there is no obvious benefit to requiring Openreach to extend its physical infrastructure to

⁷⁰ In its response to our information request of 6 March 2017, BT has estimated that between 58,000 and 200,000 poles that are used by Openreach for overhead cables (including dropwires) are not owned by BT. BT has said it does not know what percentage of its overhead final drops are served from poles it does not own. Since these poles are not owned by BT they fall outside the scope of the PIA obligation. Telecoms providers would need to seek commercial agreements with the electricity utilities to be able to access them. We note that the ATI Regulations provide a right of access to this infrastructure.

⁷¹ These options include installing a larger/stronger pole; strengthening the existing pole, for example, by adding a stay; installing an additional pole in close proximity to the existing pole; removing existing copper dropwires that are no longer required; or replacing existing copper dropwires with hybrid dropwires which can then be accessed by a competing telecoms provider deploying FTTP. With respect to the latter, in our 2016 PIA Consultation, we discussed an approach where Openreach would upgrade the existing copper dropwire to a hybrid fibre/copper dropwire, and competing telecoms providers could access the fibre. Some stakeholders preferred a variant where the existing copper dropwire is replaced with a hybrid copper/microtube dropwire, with competing telecoms providers deploying their own fibre through the microtube.

⁷² In our 2016 PIA Consultation, we also considered whether telecoms providers could rely on Openreach responding to requests to remove existing copper dropwires from consumers wanting to switch to a competing fibre network. However, there are some issues with this approach which mean that consumers are likely to be reluctant to make such a request. First, if the removal of the existing dropwire and the installation of the new dropwire do not occur at the same time, then the customer will be without a service. Second, switching in the future is likely to be more difficult and costly.

⁷³ Given the ubiquity of BT's access network it would seem likely that completely new physical infrastructure would be required mainly to connect new properties to existing BT infrastructure.

new locations rather than competing telecoms providers building their own infrastructure.

Openreach should choose how to relieve congested infrastructure

- 4.43 We consider that where our PIA network access obligation requires Openreach to remedy congested infrastructure, it should be able to choose how to do so – both for repairing existing physical infrastructure which is unusable and making additional capacity available when the existing infrastructure is capacity constrained. This provides Openreach with the flexibility to choose the most efficient solution possible, and allows it to take account of its own future requirements.
- 4.44 Notwithstanding the benefits of giving Openreach flexibility, it is important that Openreach is not able to exploit this flexibility to undermine the effectiveness of the remedy. We consider that our broader proposals prevent Openreach from doing this in the following ways:
- The non-discrimination requirements we propose to impose on BT (discussed in Section 5) prevent Openreach from applying a different approach for external PIA users to the approach taken for its own network deployments unless such a difference can be justified;
 - The requirement to produce a Reference Offer (discussed in Section 6) includes a requirement to set out the terms and conditions on which other providers may purchase PIA and access BT's infrastructure;
 - Our proposals on how BT should recover the costs of making any adjustments to relieve congested physical infrastructure (discussed in Section 7) provide Openreach with the incentive to select the most efficient approach to relieving congested infrastructure (and remove the incentive to select high cost solutions to increase a competing telecoms provider's costs of deployment).⁷⁴

Scope of PIA

- 4.45 The PIA remedy is currently limited to the deployment of broadband access networks serving multiple premises. Although this does allow for the deployment to both businesses and residential customers, it precludes symmetric-speed point-to-point leased lines (typically used to support the needs of large businesses).⁷⁵ Additionally, the current PIA remedy is limited in its use to local access deployments.⁷⁶
- 4.46 We now consider the precise form of network access obligation we should impose.

⁷⁴ Our proposals on how BT should recover the costs of making any adjustments also address the issue of incentives on telecoms providers to request adjustments only where this is necessary.

⁷⁵ The scope of the current PIA remedy is limited to use "for the purposes of deployment of broadband access networks serving multiple premises". See the FAMR Statement 2014, Annex 29, Condition 2.1A, https://www.ofcom.org.uk/_data/assets/pdf_file/0033/78837/annex_29.pdf

⁷⁶ PIA is limited to network access to "the Dominant Provider's Physical Infrastructure located between Network Termination Points and Local Access Nodes serving those Network Termination Points", as outlined in the FAMR Statement 2014, Annex 29, page 22.

2016 PIA Consultation

- 4.47 In the Strategic Review we set out our strategy to encourage investment in ultrafast broadband networks. In particular, we noted “that operators are less likely to deploy new networks if they are unable to connect business as well as residential customers. Where DPA is used to deploy to residential consumers at scale, we will look to remove this restriction.”⁷⁷
- 4.48 Prior to publishing our 2016 PIA Consultation we engaged with stakeholders to better understand the extent to which the existing PIA usage restrictions discouraged investments in ultrafast broadband networks. Stakeholders informed us that relaxing these restrictions was key for supporting their network investment case. Stakeholders argued that ultrafast broadband network build is likely to be viable in areas which coincide with demand for leased lines and that the additional revenue opportunity and economy of scope offered by delivering all types of services over the same network is required for a viable business case based on PIA.
- 4.49 In our 2016 PIA Consultation, we set out the evidence and analysis to date of the main drivers for broadening the uses of PIA. These included how, as technology and services evolve, we saw benefits to relaxing the current restrictions on the use of BT’s infrastructure as this would allow telecoms providers to design their networks flexibly, respond promptly to changes in customer needs and provide innovative services. This in turn would favour stronger and more effective competition in the provision of ultrafast broadband networks.
- 4.50 We also discussed two approaches to broaden the scope of PIA. The first is a ‘mixed usage’ approach where, provided PIA is used to deploy a broadband access network to residential and SME consumers at scale, the same network may also be used to deliver leased line services. We considered two variants of this approach; a ‘specific’ rule, and a ‘generic’ rule. The second approach we considered was an ‘any usage’ rule which allowed any use.
- 4.51 Both approaches were considered within the context of the local access area; our initial view was that any changes to usage restrictions should remain bounded by the existing wholesale local access area as defined in the current PIA remedy (i.e. between a network termination point and a local access node).

Stakeholder responses to the 2016 PIA Consultation

- 4.52 There was overwhelming support from stakeholders to broaden the scope of PIA to include leased lines, with them citing reasons such as avoiding the duplication of infrastructure assets, equivalence with BT and greater certainty in investments. Openreach and Virgin Media disagreed and did not support broadening the scope of PIA.
- 4.53 Stakeholders did not identify any additional or different approaches to broadening the scope of PIA, and most stakeholders preferred an any usage approach over a mixed usage approach.⁷⁸ Stakeholders generally agreed with our concerns that an ‘any usage’ approach could impact BT’s ability to recover its costs, and that it may lead to

⁷⁷ See the Strategic Review, paragraph 4.30.

⁷⁸ Openreach thought we should have explicitly considered the status quo as an additional option noting this was their preference.

the inefficient use of scarce duct capacity by leased lines. Some stakeholders suggested mitigations to these risks.

- 4.54 Some stakeholders expressed a preference for a mixed usage approach, highlighting that this would prevent PIA being used to provide leased lines only. These stakeholders supported the generic rule, with Openreach as the exception, supporting the specific rule.⁷⁹ In considering a mixed usage approach stakeholders questioned how it would be implemented, highlighting concerns about enforcement. Some stakeholders went further and stated that a mixed usage approach would risk being unworkable.
- 4.55 Those who commented on the geographic scope of PIA argued that, as currently defined, the PIA remedy is too narrow in terms of its geographic scope (i.e. the parts of the BT infrastructure network where PIA can be used). These respondents have argued that restrictions are both unnecessary and may severely impact the effectiveness of the remedy.⁸⁰ Four main points were made in support of a wider geographic scope:
- It is likely that BT's local access network areas are smaller than those which other telecoms providers would deploy because of the age of BT's network deployment and its underlying copper technology. Consequently, limiting usage of PIA to areas corresponding in size to BT's local access areas may force telecoms providers to have smaller local access network areas than an efficient fibre-based network design might require.
 - Defining local access by reference to BT's network may influence telecoms providers to locate their local access nodes in the centre of BT's local access areas.
 - It is unclear how BT would interpret the geographic scope restrictions for PIA deployments that have a different topology to its own network, e.g. networks that do not have local access nodes comparable to those in BT's network.
 - BT's own access network deployment (e.g. for FTTC services) is not limited so neither should rivals' network deployment be limited when using PIA.

Consideration of the scope of PIA

- 4.56 When considering the form of our proposed network access obligation, our starting point is to consider imposing a network access obligation without any restrictions on use or scope.⁸¹ In most instances where we impose network access requirements,

⁷⁹ Openreach expressed this preference in the event the status quo was not maintained.

⁸⁰ [S<] The convergence of fixed and wireless markets has been considered in the WLA market review, which has provisionally concluded that for most customers fixed wireless is unlikely to be a close substitute for broadband services over copper, fibre or cable for this market review period.

⁸¹ In its response to the 2016 PIA Consultation, at page 27, the PAG consider it is unclear whether usage restrictions at all are lawful and consistent with the Common Regulatory Framework. We disagree. Article 8 of the Access Directive clearly requires that regulatory obligations, including network access obligations imposed under Article 12, must be based on the nature of the problem identified, proportionate and justified in the light of the objectives laid down in Article 8 of the Framework Directive. The PAG appears to be suggesting that once a National Regulatory Authority decides to impose a network access obligation, it must impose an unrestricted form in all circumstances. This is clearly inconsistent with Article 8 of the Access Directive. The PAG also question whether usage restrictions are permissible under Competition Law, although the point being

such restrictions are unnecessary and may present a risk of regulatory failure. Therefore, in such cases, imposing an unrestricted network access obligation is both appropriate and proportionate. For example, the MPF and VULA obligations we are proposing in this market review have no such usage restrictions.⁸²

- 4.57 However, unlike other forms of network access, PIA can be used as an upstream input into several downstream products, some of which are in markets which are not downstream of the WLA market. For example, PIA can be used to supply both leased line services and broadband access services to multiple premises. Consequently, in this market review, it would be inappropriate to put in place an unconstrained PIA obligation (in respect of use and geographic scope) which may be used by telecoms providers for purposes that are not consistent with this being a remedy in the WLA market. Therefore, we consider that it is necessary to impose some restrictions in order to ensure that the PIA remedy is sufficiently limited to addressing BT's market power in the WLA market.
- 4.58 It was for this reason that in 2010 and 2014 the imposition of a PIA remedy included a usage and geographic restriction. Specifically:
- Usage: for the purposes of deployment of broadband access networks serving multiple premises; and
 - Geographic reach: located between Network Termination Points and Local Access Nodes serving those Network Termination Points.

Usage

- 4.59 The current usage restriction only permits PIA to be used for downstream products, such as broadband and fixed telephone services, which make use of inputs from the WLA market. We have therefore considered whether the competition concerns identified in Section 3 could be addressed effectively while maintaining the use restriction on PIA that is currently in place. Our provisional view is that this use restriction has undermined the effectiveness of PIA:
- There has been very limited take-up of PIA since its introduction in 2010.
 - Limiting technology flexibility reduces a telecoms provider's confidence that it will be able to evolve its network design after initial deployment, constraining its ability to adjust its technology choices as the market develops in the future.
 - Limiting the scope of the PIA remedy removes the ability of telecoms providers to exploit the economies of scope possible from deploying and providing multiple services jointly on a single network.
- 4.60 Limiting technology flexibility and limiting the scope of the PIA remedy is likely to materially increase the risk that a telecoms provider may take the view that it is not viable to invest in the first place. For example, a fibre network is costly to build, but

made is not clear. To the extent that it is suggesting that imposing a usage restriction would be an abuse of dominance contrary to Article 102 TFEU, we disagree.

⁸² Local loop unbundling (LLU) enables telecoms providers to take control of BT's physical telephone lines so that they can provide services direct to end customers. Metallic Path Facility (MPF) is the version of LLU in which the provider offers both broadband and voice services over the line to its customer. Virtual Unbundled Local Access (VULA) is used to deliver superfast broadband over BT's FTTC network.

once deployed has almost limitless capacity. The commercial business case for the initial investment therefore typically relies on using this capacity to generate as many different revenue streams as possible, through a wide range of different services. Information received from stakeholders supports this, and suggests the current use restriction has reduced the viability of their business cases, limiting the extent that investments in ultrafast broadband could be justified. In order to be effective, the PIA remedy needs to allow telecoms providers to be able to take full advantage of the technologies available, the density of potential customers, and to achieve sufficient scale and scope.⁸³

Technology flexibility

- 4.61 Historically, broadband connections typically offered contended and asymmetrical access, i.e. bandwidth is shared with other users and download speeds are higher than upload speeds. In contrast, leased lines are symmetric and uncontended, leading to high-quality, dedicated services more suited for use by businesses, government and local authorities, financial and data centres etc. as well as telecoms providers themselves. For example, mobile communication providers use leased lines to connect their radio base stations to their core network nodes.
- 4.62 As the technology supporting ultrafast services develops, it will become increasingly possible to use ultrafast broadband to provide an alternative to leased lines at least for users that do not require some of the features typically associated with leased lines, including resilience and security. Therefore, for some customers who currently use leased lines, ultrafast broadband may meet their needs.⁸⁴ On the other hand, as data demand grows, small businesses currently using broadband connections may consider switching to a connection which offers equally fast speeds both for uploading and downloading.⁸⁵
- 4.63 When building their networks, we understand that telecoms providers would therefore want to retain flexibility to meet the specific needs of their customers, for example to lay fibre in both point-to-point and point-to-multipoint architectures and use different technologies and switch between them.⁸⁶ On this basis, current restrictions are likely to:
- favour specific technologies and network architectures over others with the risk that regulation, rather than market dynamics, drives technology choices;

⁸³ We have used our information gathering powers to understand the effect of usage restrictions in the business case for broadband deployments at scale and undertaken our own analysis. The analysis suggests these restrictions undermine the investment efficiency of telecoms providers (by, for example, not allowing them to benefit from economies of scope). Our view is that removing such inefficiencies could have a pivotal effect on investment plans, potentially unlocking investment in areas that would otherwise not be viable, leading to sufficient scale to make the total business plan viable. We therefore consider that usage restrictions limit the scale and viability of broadband roll-out.

⁸⁴ For example, Openreach is planning to launch a new FTTP broadband product with guaranteed speeds of up to 1 Gbit/s specifically designed to offer businesses an alternative to leased lines <http://www.btplc.com/news/index.htm#/pressreleases/openreach-makes-gigabit-speeds-available-across-the-uks-largest-wholesale-ftp-network-1638866>, [accessed 6 April 2017]

⁸⁵ For example, stakeholders have indicated that small businesses are increasingly moving their data and applications to cloud-based systems and require high-speed, symmetric connections.

⁸⁶ FTTP broadband networks are typically deployed by means of passive optical networks (PONs) where each broadband user shares a section of the access connection with other users. They typically require less fibre and optical/electronic equipment than a point-to-point network and make use of optical splitters to create the one-to-many linkages. Passive optical network equipment can be configured to provide services similar to point-to-point services.

- constrain telecoms providers from being able to respond promptly to changes in demand and supply; and
- limit their ability to provide innovative services and therefore compete with infrastructure providers such as Openreach and Virgin Media.

4.64 It follows that technology flexibility is particularly important for a telecoms provider as without the confidence that it will be able to evolve its network design after initial deployment, and adjust its technology choices as the market develops in the future, there is a material risk that it may take the view that it is not viable to invest in the first place.

Economies of scope

4.65 Economies of scope, may arise if there are cost savings from deploying and providing multiple services jointly on a single network, as compared to deploying the same services on separate networks or infrastructure. Such savings typically arise from costs which are common across services. For example, there may be costs that need to be incurred to serve either or both broadband and point-to-point leased lines customers.⁸⁷ Where a telecoms provider cannot offer point-to-point leased lines on its own network, it will need to spread the common costs of building and operating the infrastructure across a smaller customer base comprising only broadband customers. Therefore a telecoms provider seeking to build its own fibre network would ideally combine different technologies and architectures to offer as wide a range of services as possible.

4.66 The relevance of economies of scope in the local access network ultimately depends on the geographic overlap between different types of customers. We have analysed different sources of evidence on the extent of geographic overlap.^{88 89}

4.67 We have analysed the overlap between non-residential premises (businesses and other organisations) and residential premises in each BT exchange area.⁹⁰ We consider non-residential delivery points (i.e. postal addresses) as a proxy for demand for leased lines, and residential delivery points as a proxy for ultrafast broadband

⁸⁷ In the local access network, economies of scope are mainly expected to arise from common routes between both point-to-point and point-to-multipoint architectures on the way from the local access node to the customers' premises.

⁸⁸ For example, based on its experience, one telecoms provider [redacted] considered demand for leased lines to be broadly correlated with population in urban areas. We understand that in addition to large businesses, other institutions such as schools and council buildings, as well as other applications such as CCTV networks, are increasingly demanding point-to-point services, including within residential areas. In addition, point-to-point leased lines are used for backhaul to mobile masts. These are increasingly located in residential areas in order to meet the rapidly increasing data demand of mobile smartphone users. Point-to-point fibre leased lines are also likely to be increasingly prevalent in the future to provide connectivity for 4G and 5G technologies.

⁸⁹ Another telecoms provider [redacted] provided analysis which showed that in a particular highly dense urban area, almost a quarter of businesses are located in premises which are shared with residential customers, and some of these businesses are expected to demand leased lines.

⁹⁰ This analysis is based on Ordnance Survey's Code-Point database, a database containing information on postal delivery points by postcode. The database classifies delivery points as domestic (residential) or non-domestic (businesses or organisations, identified as delivery points having an organisation name). We use data provided by BT in 2015 which maps postcodes to BT's exchanges to estimate the number of business and residential delivery points in each BT exchange area. Our analysis excludes Northern Ireland, as the Code-Point database does not contain information on delivery points for this area.

demand.⁹¹ On average, we estimate there is around one non-residential delivery point to every 20 residential delivery points, with a ratio varying between 1:10 and 1:30 across around six out of ten BT local exchange areas.⁹² In fact, most of the non-residential and residential delivery points are located in exchange areas where the ratio of non-residential to residential delivery points is within that range.⁹³ This suggests that there is likely to be geographic overlap between demand for leased lines and demand for ultrafast broadband.⁹⁴

- 4.68 This evidence also shows that potential broadband customers tend to outnumber potential leased lines customers by a significant factor. This may have implications for the role economies of scope play in different business models:
- A mass broadband deployment requires having ubiquitous network presence in a given area. Therefore, by extending a broadband deployment to serve leased lines customers, a telecoms provider may be able to save a substantial portion of infrastructure costs and offer point-to-point leased lines at a modest incremental cost. This may play an important role in de-risking a pure fibre based broadband business plan. For example, a telecoms provider⁹⁵ has argued that extending a residential deployment to cover business premises involves a relatively small incremental investment, with an average cost per additional business premises passed lower than the average cost per home passed of a residential-only deployment.
 - Conversely, the relatively low number of potential leased lines customers limits the extent of the economies of scope in the overall cost of an access deployment. A substantial portion of the network routes required to serve broadband customers is unlikely to be shared with leased lines customers: even if there are common cost savings in a mixed deployment, the incremental costs of mass broadband roll-out are likely to remain a substantial portion of the overall costs of the deployment.
- 4.69 We also consider that the prospect of additional revenues from leased lines will make the new PIA remedy effective as stakeholders have informed us this is important for their investment decisions of new fibre roll-out based on duct and pole access.
- 4.70 We understand that offering multiple services would give investors greater pricing flexibility which would ultimately translate into better opportunities to attract customers, compete effectively and may ensure that it is viable to invest in the first

⁹¹ The analysis includes all small and large businesses and organisations (such as schools and public authority buildings) with a registered organisation name in postal addresses. We recognise that this is an approximation of demand for leased lines. Some businesses are likely to demand broadband rather than leased lines services. Moreover, other possible sources of demand for leased lines – both now and in the future – are not reflected in the analysis (for example, mobile masts or CCTV).

⁹² In 63% of BT exchange areas the ratio of delivery points for business and organisations to residential is between 1:10 to 1:30.

⁹³ About 76% of the non-residential delivery points and 71% of the residential delivery points are located in exchange areas where the ratio of non-residential to residential delivery points is between 1:10 and 1:30.

⁹⁴ Although there is some variation in the ratio of non-residential to residential premises across exchanges, most exchanges tend to have both types of delivery points and do not tend to specialise in either type of customer. If there was no geographic overlap, we would expect, for example, most non-residential delivery points to be located in exchange areas with few residential delivery points.

⁹⁵ [S&C]

place.⁹⁶ Telecoms providers would have the opportunity to set different prices for different services taking account of willingness to pay, as typically operates in competitive markets. This would allow the recovery of a greater proportion of costs from the services for which there is a higher willingness to pay. This is consistent with the way end-to-end infrastructure competitors recover their costs currently.⁹⁷

Our proposals on usage

4.71 Our provisional view is that the current use restriction prevents the PIA remedy from being effective as a basis for large scale roll-out of competing local access networks. Therefore, unless the current use restriction is relaxed or removed, the PIA remedy will not achieve our aim of promoting greater network competition with a view to addressing the competition problems we have identified in the WLA market. This is because:

4.71.1 as technology and services evolve, we believe there are benefits to relaxing the current restrictions on the use of BT's duct and pole infrastructure as this would allow telecoms providers to design their networks flexibly, respond promptly to changes in customer needs and provide innovative services; and

4.71.2 the ability to exploit economies of scope in deploying and providing multiple services jointly on a single network is likely to significantly improve the viability of telecoms providers' business cases, helping to justify their initial investments in ultrafast broadband.

4.72 As explained above, our preference would be to impose a general PIA obligation (i.e. one that does not include any usage restrictions) given the risk of regulatory failure from imposing such restrictions, such as limiting flexibility and technology choices. In the absence of any incentives on telecoms providers to use the PIA remedy to provide services that are not reliant on inputs from the WLA market, this would be the simplest and most effective way of ensuring that the PIA remedy is flexible enough to accommodate the mixed deployments necessary to make PIA effective. However, given our understanding of the likely market dynamics over the next few years, we are concerned that in the absence of usage restrictions, there is a risk that some telecoms providers might use PIA only to build a limited number of high value point-to-point leased lines connections. Since such services are not part of the WLA market, or downstream from the WLA market, this would not promote greater network competition in accordance with our aims, and would not be consistent with PIA as a remedy in the WLA market.

4.73 Therefore, our provisional view is that it is necessary to impose some form of mixed usage restriction on PIA to make the remedy effective.⁹⁸ We consider below how the current usage restriction should be amended.

⁹⁶ For example, Vodafone said that their analysis shows the incremental cost of adding additional services to fixed network roll-out is small, whilst the revenue benefits to make the overall plan more viable are essential. Vodafone's response to the 2016 PIA Consultation, paragraph 25.

⁹⁷ For example, according to its 2014/15 Regulatory Financial Statements, BT recovers 15% of its total wholesale duct costs from regulated Alternative Interface (AI) and Multiple Interface (MI) business connectivity services.

⁹⁸ We note that in response to the 2016 PIA consultation, various stakeholders set out views on the any usage rule including views on the risks and challenges. Given our provisional view that it is necessary to impose some form of use restriction, we do not respond to those views.

Approaches to broadening PIA usage

- 4.74 In terms of what form of mixed usage restriction is appropriate, we have considered both a 'specific' and 'generic' rule. We believe that while a specific rule affords telecoms providers with additional certainty compared to a generic rule, the benefits of certainty are likely to be outweighed by the risk of regulatory failure as a result of limiting flexibility, for example, by imposing a network topology on telecoms providers. This may reduce the viability of their business cases, limiting the extent that investments in ultrafast broadband could be justified and placing them at a disadvantage to Openreach which is not subject to such a constraint.^{99 100}
- 4.75 Given this restriction of the specific rule, we have considered whether this can be addressed by the suggestion made by Openreach, that these restrictions could be overcome by offering exemptions from them in exceptional cases. However, we are concerned that in practice these exemptions would be required more frequently, leading to a de facto generic rule. This would also place a significant administrative burden on Ofcom and risk making the rule unworkable.
- 4.76 While in certain circumstances a specific rule is capable of being effective, our provisional view is that it would not be in this context since it carries too high a risk of regulatory failure.
- 4.77 In contrast, we consider that a generic rule is likely to be effective since it will allow for some flexibility whilst ensuring that telecoms providers are permitted to use PIA to deploy networks providing a broader range of services, but only insofar as this enables the investment in the provision of broadband services more generally. We also believe that this approach will be workable in practice, as discussed in terms of implementation below.
- 4.78 Further, our provisional view is that a generic mixed usage rule would also be the least onerous requirement necessary to address our competition concerns. For the reasons set out above, we consider that the less onerous approaches of restricting use exclusively to deployment of broadband networks, or setting out a specific mixed usage rule, would not be effective.
- 4.79 Were the market environment to change in the future we would consider if this approach should change, to reflect this.
- 4.80 Following on from the above, our provisional view is that it is appropriate to relax the current PIA usage restriction to allow 'mixed usage' so that PIA can be used to deploy local access networks offering both broadband and non-broadband services provided the purpose of the network deployment is primarily the delivery of broadband services to homes and businesses provided this mixed use enables the

⁹⁹ Openreach argued that a specific rule is more suitable as a generic rule would lack certainty and transparency, which are part of our key regulatory objectives, and would impose a far greater resource burden on Openreach and ourselves. Openreach noted a specific rule has the benefit of increased certainty and can be better designed to achieve the specific outcomes a mixed usage rule is intended to achieve, whilst protecting against the unintended consequences of a lack of ultrafast/FTTP investment. Openreach response to the 2016 PIA Consultation, page 27, paragraph 125..

¹⁰⁰ To address the concern of unintended consequences discussed above, Openreach considered a specific rule could apply except in exceptional circumstances where telecoms providers could apply to us for a derogation. Openreach noted there are mixed usage planning rules in the property sector which could provide a model for how this might work.

investment in the provision of broadband services more generally. This will support the effectiveness of the PIA remedy in the WLA market.

Geographic reach

- 4.81 We have also considered whether maintaining the current geographic scope of PIA remains appropriate to address our competition concerns. As explained above, the current PIA remedy permits the use of BT's duct and pole network between BT's network termination point and BT's local access node.
- 4.82 The definition of geographic scope in the current PIA remedy is intended only to limit usage of PIA to local access network deployments. It does not impose or imply a requirement for telecoms providers to adopt a network topology similar to BT's (e.g. to locate their local access network nodes at or near to BT's Next Generation Access (NGA) network exchanges).¹⁰¹ It also permits telecoms providers to deploy local access networks using a combination of their own infrastructure and PIA, 'breaking in and out' of BT's physical infrastructure as required.¹⁰²
- 4.83 During the consultation process, various stakeholders explained that the current geographic scope of PIA risks restricting telecoms providers to BT's network architecture when using PIA to deploy ultrafast broadband networks. BT's network architecture is that of a copper network. However, when deploying an ultrafast broadband network, it is likely that BT's architecture may not be optimal. For example, BT's own FTTC network adopts a different network architecture with fewer aggregation points. There is therefore a risk that the current geographic scope means that PIA could be used only for part of a telecoms provider's local access network (because their local access network area is larger than BT's copper one) hence rendering the remedy less effective than it should be.
- 4.84 Consequently, our provisional view is that it is necessary to amend the geographic scope of PIA to make the remedy effective.
- 4.85 As noted above, although it is possible to impose no limitation on the geographic scope of the PIA remedy, there is a risk that an unconstrained PIA obligation, in respect of geographic scope, may be used by telecoms providers for purposes that are not consistent with a remedy in the WLA market. For instance, telecoms providers may have an incentive to use PIA for core networks.
- 4.86 Therefore, we consider that it remains appropriate to restrict the geographic scope of PIA to the deployment of the local access part of a broadband network. However, rather than imposing this limitation by reference to BT's local access network architecture, we are proposing to broaden this so that PIA may be used between network termination points and the local access node serving those termination points.

¹⁰¹ However, telecoms providers may choose to locate their local access nodes at BT exchanges, and the current PIA condition requires BT to provide co-location services at exchanges.

¹⁰² The current PIA remedy limits geographic scope by setting an expectation that the maximum distance between network termination points (customers' premises) and local access nodes should be BT's fibre access nodes, used for FTTC and FTTP. We consider these distances are likely to be as much a function of the population distribution of the UK as BT's legacy copper network architecture and therefore reasonably representative of the reach of NGA networks generally, however, we acknowledge that telecoms providers may in some circumstances wish to deploy local access networks with greater reach than BT's.

- 4.87 Specifically, we propose to modify the PIA condition to broaden the geographic scope of usage to include a reference to telecoms providers' local access networks such that telecoms providers will be permitted to use PIA between network termination points (i.e. customers' premises) and their local access node serving those network termination points. This revision also makes clearer that there is no requirement for telecoms providers' local access networks to be bound to BT's topology.

How our proposals on the scope of PIA would work in practice

- 4.88 In Section 6 we set out our proposals concerning the PIA ordering process and the role of service level agreements to ensure this process is not unduly delayed by Openreach. For example, we discuss our expectations on timescales for Openreach response times following any request for PIA.
- 4.89 Were Openreach to receive a request for PIA from a telecoms provider and Openreach rejected such a request, we would expect Openreach to provide the reasons for any such rejection, which for example might relate to the telecoms provider's compliance with the mixed usage rule. Telecoms providers may then consider whether they wish to challenge Openreach's reasoning, including through dispute resolution under the Communications Act 2003.¹⁰³
- 4.90 We set out below an indication of the factors we would likely take into account when considering compliance with the mixed usage and/or geographic scope rules, in the context of any such disputes we might take on. There is potentially a very wide range of cases involving different network designs and different types of network provider and the level of detail we provide reflects this. It may be in the future that it is helpful to update this guidance with more specific information relating to particular circumstances if, for example, it becomes clear that there is demand for PIA for a particular type of network design. While the guidance sets out considerations we think are likely to be relevant, each referral would be assessed on the specific facts of the case.
- 4.91 There are several features of telecoms providers' deployments which appear relevant to any consideration of whether a particular request for network access is consistent with the mixed usage and geographic scope rules we are proposing to impose on BT. These features are:
- 4.91.1 **Geographic location of the infrastructure** - whilst we propose to broaden this so that PIA may be used between a telecom provider's network termination points and the local access node serving those termination points, we would expect telecoms providers to be able to demonstrate that their usage of PIA is for local access segments of their network. In the event of a dispute we might consider the distance between network termination points and local access nodes in comparable networks as a guide to understanding if the telecoms provider's use of PIA was within the local access area. However, if distances appeared to be longer than other access networks we would consider if this was because of the technology

¹⁰³ Some stakeholders suggested that some sort of certification or authorisation process for PIA applications would be appropriate if a mixed usage rule was adopted to ensure PIA orders could be pre-approved in line with the rule. However, because no two PIA orders would be identical, pre-approval would still require some individual consideration, hindering a general certification process. Furthermore, noting the provisions in place to protect confidential information we believe an authorisation or certification process would likely be administratively burdensome and overly complex. Therefore, we are not proposing to include this in our proposals.

or architecture adopted by the telecoms provider. For example, if a telecoms provider already has a local access node in a neighbouring town, while its local area geography would be different to BT's, its use of PIA may still be within the local access area;

- 4.91.2 **Services to be offered within any deployment** – specifically the mix between broadband network services and leased lines. The primary purpose of a deployment should be broadband networks. For example, telecoms providers installing more leased lines than the number of broadband premises passed would be unlikely to meet the requirements of the mixed usage rule.¹⁰⁴ We would also consider the extent to which the mixed use enables the investment in the provision of broadband services more generally;
- 4.91.3 **Extent of infrastructure in the local access area shared between services** – we would expect telecoms providers to be able to demonstrate that their usage of PIA is in fact mixed. We would expect that any leased line services share passive network elements with broadband services, to a material extent;
- 4.91.4 **Certainty of the intention to undertake a broadband deployment** – we recognise that some network deployments may be phased with, for example, leased lines services being deployed in advance of broadband services. We believe that a mixed usage rule should be flexible to allow for this. The potential for phased service deployment may therefore require determining the commitment of the telecoms provider to deploy broadband services. For example, contracts in place with residential developers for broadband services, or committed funding and orders for equipment only suited for broadband services¹⁰⁵ would evidence significant intention. Conversely an internal business case, unfunded and for discussion purposes only, would by itself be less persuasive of sufficient intention to meet the requirements of the mixed usage rule;¹⁰⁶ and
- 4.91.5 **How broadband services are provided:** we recognise that some telecoms providers may choose a network architecture to provide broadband services to multiple premises that may also be suited for providing leased lines.¹⁰⁷ As discussed above, we want to support technological innovation and flexibility in how services are provided. Relevant factors would therefore include the type of customers being targeted and the type of services being sold.

¹⁰⁴ In its response to the 2016 PIA Consultation, Openreach suggested that this type of factor should be based on premises connected and not solely focussed on the number of premises passed, and that this should be monitored and enforced through a combination of regulation and contract, with an ability to audit. We disagree as, at the point of ordering PIA, no live services would be available and no premises would be connected. Furthermore, the number of premises connected with an active service is dependent on other factors partially outside a telecoms provider's control, such as competitive responses.

¹⁰⁵ For example, passive optical splitters.

¹⁰⁶ This approach would also be relevant if intentions changed for commercial reasons after network deployment using PIA.

¹⁰⁷ For example, using point-to-point fibre aggregated at the local access node, rather than passive optical splitters at distribution points in the network.

- 4.92 Ultimately PIA is ordered on an individual segment by segment basis and it would not be practicable to assess what each individual segment is being used for. Therefore, in the event of a dispute, we would expect to consider the above features applied across the local area, looking holistically at the network deployment in the local access area. In the case of a hybrid network deployment, where PIA is only used for some segments of an overall network design while the rest of the network infrastructure is self-built, we would expect to take a similar holistic approach.
- 4.93 The above list is not an exhaustive set of features that we would take into consideration in any dispute, not least as there may be innovations during the period of this market review which have not yet been identified.¹⁰⁸
- 4.94 Various stakeholders were concerned that implementation of a mixed usage rule would require them to share business models with Openreach or would be complex and burdensome to comply with.¹⁰⁹
- 4.95 Considering the sharing of business models, we do not propose that telecoms providers would be compelled to provide any information to Openreach beyond the details of the duct and poles they are seeking access to. Furthermore, any information provided to Openreach in confidence as part of a PIA application is protected through the requirements set out in General Condition (GC) 1.2 which precludes the passing of information gathered for the process of negotiating network access to any other part of Openreach where it could provide a competitive advantage.¹¹⁰ We set out in Section 6 our expectations that Openreach will ensure processes are in place that will ensure compliance with this General Condition.
- 4.96 Considering the burden of managing this rule, the number of scale users of PIA is anticipated to be limited and together with public visibility of their marketing activities, we would expect Openreach to be able to assess whether it considers a PIA order to be compliant with a mixed usage rule, without this assessment being burdensome to Openreach or Ofcom. We would expect that in most cases it will be clear whether a network access request is compliant with the PIA usage rules.¹¹¹

¹⁰⁸ For example, this could include new forms of lead-ins connecting the premises to the distribution point.

¹⁰⁹ Specifically, stakeholders raised the following: a generic rule may require the provision of sensitive information such as business plans to Openreach; it would impose a burden on Openreach and ourselves in assessing compliance and could slow the PIA process; if after installation the rule is deemed to be breached, it may not be practicable to remove the capacity already installed; and a generic rule would lack certainty and predictability and would be difficult to enforce with consistency.

¹¹⁰ GC 1.2: "Where the Communications Provider acquires information from another Communications Provider before, during or after the process of negotiating Network Access and where such information is acquired in confidence, in connection with and solely for the purpose of such negotiations or arrangements, the Communications Provider shall use that information solely for the purpose for which it was supplied and respect at all times the confidentiality of information transmitted or stored. Such information shall not be passed on to any other party (in particular other departments, subsidiaries or partners) for whom such information could provide a competitive advantage."

https://www.ofcom.org.uk/_data/assets/pdf_file/0026/86273/CONSOLIDATED_VERSION_OF_GENERAL_CONDITIONS_AS_AT_28_MAY_2015-1.pdf

¹¹¹ We note that the more restrictive usage rule under the current PIA remedy, which prohibits the provision of any leased line services, has not resulted in an unreasonable resource burden in assessing compliance, even as PIA volumes have increased rapidly in the past year.

Adverse effects

- 4.97 We have considered whether our proposed form of PIA remedy, including the scope restrictions discussed above, might give rise to adverse effects which are disproportionate compared to the aim of the proposals.
- 4.98 We have considered the following adverse effects:
- the cost of competition;
 - the impact on end-to-end competition;
 - the additional costs and resource requirements imposed on Openreach; and
 - the impact on business connectivity markets.

Cost of competition

- 4.99 By avoiding the need for rivals to build their own infrastructure, PIA-based competition entails much lower duplication of fixed costs than end-to-end competition. However, there may still be duplication of some fixed costs (for example, fibre and active network elements), which could put upward pressure on average costs, and therefore prices.
- 4.100 In this review period, we expect any impact from fixed cost duplication and loss of scale to be small given the natural constraints on build rates associated with mass broadband deployments. For example, we estimate that up to 0.4 million households could be taking services provided over a new access network built using PIA by the end of 2020/21 – which provides an upper bound for the reduction in Openreach volumes by the end of this period.¹¹² This amounts to a reduction in Openreach volumes of less than 2%.
- 4.101 Over the longer term the impact may become more significant. However, we believe that this is likely to be outweighed by the significant benefits to consumers in the longer term from choice, innovation (including innovation to increase efficiency and lower costs), stronger incentives to price keenly to attract customers and higher quality of service.
- 4.102 We also recognise that while an effective PIA remedy could make downstream services potentially competitive in many geographic areas, in other areas it may become apparent that the prospects for rival investment are limited.¹¹³ As a result, a greater degree of differentiation in our regulatory approach across the UK may emerge in time, with different remedies needed in different geographic areas. We will be able to consider the most appropriate approach to the recovery of costs taking into account market circumstances, including declining volumes.

¹¹² Information from stakeholders on the speed at which a new access network can be deployed in the first years of deployment suggests that up to 1 million homes could be passed by the end of this review period. The impact on Openreach's volumes will then depend on the possible penetration rates that can be achieved by a new access network. Assuming a maximum penetration rate of 40% points to 0.4 million households taking services provided over a new access network.

¹¹³ The economics of deployment vary by geography, for example, because of differences in the costs of deployment.

Impact on end-to-end competition

- 4.103 An effective PIA remedy will reduce the absolute costs and time required to build ultrafast broadband networks at scale. We have considered what effect this will have on end-to-end competition (i.e. where competitors build their networks from scratch, including their own physical infrastructure).
- 4.104 We recognise that existing end-to-end competitors which have already deployed networks by building their own physical infrastructure may face a more competitive environment in certain areas, which could affect their ability to retain some of their customers without adjusting prices. However, at the same time, an effective PIA remedy provides these telecoms providers with opportunities to expand their networks at lower cost (and more quickly), allowing them to compete in areas where it would not be viable to deploy their own physical infrastructure. We observe that many existing end-to-end competitors, including Virgin Media¹¹⁴, are supportive of our intention to give operators improved access to BT's physical infrastructure.
- 4.105 We also recognise that encouraging network competition based on PIA could undermine incentives to undertake further end-to-end investment where this would otherwise have been viable. Given the higher costs and time required to build a new network from scratch, the scope for end-to-end network competition is more limited than the scope for network competition based on PIA. Therefore, to the extent our remedy displaces some end-to-end competition, this is likely to be outweighed by the significant benefits of realising network competition based on PIA in potentially many more geographic areas.¹¹⁵ Moreover, as discussed above, PIA based competition entails much lower duplication of fixed costs than end-to-end competition.

Additional costs and resource requirements on Openreach

- 4.106 Some of our proposals will impose additional resource requirements and costs on Openreach.
- 4.107 First, we are requiring Openreach to undertake work to develop the PIA product and processes further. The most significant of these in the short term is likely to be the requirement to make improvements to its systems (see paragraphs 6.56 to 6.59). We expect the costs and resource requirements on Openreach to be relatively modest.¹¹⁶ We discuss the recovery of these costs in Section 7. As to the resource requirements, we think there is unlikely to be any material adverse impact on Openreach, particularly given that Openreach has already been engaged in making improvements to the PIA processes and online mapping systems over the past year. In any event, we consider any impact to be justified by the potential for significant benefits to consumers in the longer term from greater network competition.
- 4.108 Second, our proposed remedy includes a requirement on Openreach to relieve congested sections in its own infrastructure. In some cases, Openreach would have to undertake this work in any event to maintain its network, albeit the request under PIA may bring forward the timing of this work. Notwithstanding these cases, we

¹¹⁴ Virgin Media response to 2016 PIA Consultation, page 1.

¹¹⁵ Even taking into account the incremental benefits of end-to-end competition over PIA-based competition.

¹¹⁶ To better understand the potential timescales and costs involved in developing such a system, we sought advice from external consultants Mott MacDonald. The report provides Mott MacDonald's broad estimates of the timescales and costs of developing such a system and will be published shortly after this consultation.

recognise that the requirement could have a material impact on Openreach, both in terms of the resources required to carry out repairs and install additional capacity, and the costs associated with these adjustments. We discuss the recovery of these costs in Section 7. With respect to the resource requirements, we recognise that over time Openreach could see a significant step up in the volume of civil works it is required to undertake or oversee. Openreach may need to expand its workforce, for example, by hiring more network planners and field engineers.

- 4.109 However, we consider that the resource burden is sufficiently predictable that Openreach can manage this without any significant adverse impact, for two reasons. First, any increase in the requests for network adjustments will be gradual, given the natural constraints on build rates associated with mass broadband deployments and the likelihood that it will take time for telecoms providers to increase their roll-out to the maximum deployment rate. Second, telecoms providers using PIA are required to submit forecasts of their likely usage of PIA.
- 4.110 We also observe that requests for Openreach to relieve congested sections in its infrastructure will only arise where other telecoms providers are using PIA to deploy competing networks. Therefore, the scale of the impact on Openreach is contingent on the scale of network deployment, and so is directly linked to the scale of the benefits that result from imposing the PIA remedy. Therefore, we consider that any impact on Openreach is justified by significant benefits to consumers in the longer term from greater network competition.

Impact on business connectivity markets

- 4.111 We have considered the impacts of our proposal to allow PIA to be used for provision of non-broadband services, including symmetric-speed point-to-point leased lines, in the business connectivity markets.
- 4.112 In general, we believe the proposed scope restrictions mitigate any impact:
- The geographic reach of the proposed PIA remedy excludes backhaul services, and therefore these services would not be impacted.
 - The mixed usage rule means that telecoms providers would only be able to use the PIA remedy to provide leased lines in the context of a network deployment primarily used to provide mass broadband services. This will ensure that any adverse effects are associated with benefits in the WLA market. In particular, large impacts in the business connectivity markets would only arise in scenarios where there has been extensive roll-out of rival local access networks. These scenarios would entail a transformational change in the competitive conditions of the local access area, and therefore be associated with substantial benefits.
- 4.113 The mixed usage rule also means that our proposals are unlikely to have a material impact in business connectivity markets within this market review period. Given the natural constraints on build rates associated with mass broadband deployments, only a small percentage of leased lines would be within network reach in the short term. Even assuming telecoms providers will very aggressively target areas with greater business density, we estimate that less than 12% of business premises would be within the footprint of new PIA-based network deployments by the end of this market review period.¹¹⁷ We acknowledge that impacts in the longer term are more uncertain

¹¹⁷ Annex 5 provides a detailed explanation on our illustrative estimate of the proportion of non-residential premises within network footprint of PIA-based network deployments.

and harder to predict, although still bounded by the scope of the remedy. We recognise that relaxing usage restrictions may have wider effects for local access circuits in business connectivity markets in the long term, including both positive effects (for example, increased competition) and negative effects.¹¹⁸ In future market reviews, we will be able to consider the most appropriate approach to regulation taking account of developments, including the extent of any effects as they become clearer.

4.114 Below, we consider the following specific impacts in the business connectivity markets:

- the impact on Openreach's cost recovery of regulated products; and
- the impact on end-to-end competitors.

Impact on Openreach's cost recovery of regulated products

4.115 By allowing telecoms providers to use PIA for business connectivity services in certain circumstances, this may have the effect of increasing the competitive pressure on some of Openreach's wholesale active products, especially where these are subject to limited or weak competition. As a consequence, Openreach might see a reduction in its leased lines volumes which could affect BT's ability to recover its costs from regulated products.

4.116 In Annex 5, we illustrate the possible cost recovery implications for Openreach of allowing use of PIA in local access areas under a mixed usage rule. We have looked at the regulated services in the business connectivity markets which may come under greater competitive pressure as a result of relaxing PIA usage restrictions, and the costs associated with these services based on 2014/15 Regulatory Financial Statements (RFS) data.

4.117 We expect impacts to be small within this market review period. There is a high degree of uncertainty around the potential effect on cost recovery, as this depends on a number of factors which are hard to predict and measure accurately. However, under a range of plausible assumptions, the effects in the short term could be up to £5m per year.¹¹⁹ This figure does not incorporate offsetting incremental PIA rental revenues that Openreach would obtain.

4.118 In the longer term, it is possible that the impact on cost recovery could be significantly greater. This is because a larger proportion of leased lines could be within the reach of broadband networks deployed using PIA. The potential cost recovery implications in the longer term are even harder to predict, and will depend on how the business connectivity markets evolve over time. Illustrative analysis based on 2014/15 RFS data suggests that the cost recovery at risk could be as high as £33m a year.¹²⁰ This figure does not incorporate offsetting incremental PIA rental revenues that Openreach would obtain, and we expect these to play a more

¹¹⁸ As an example of a negative effect, increased competitive pressure may force leased line providers to change their pricing structure. This may have a negative effect on some leased lines customers located in areas where competition is unlikely to increase.

¹¹⁹ Under assumptions suggested by Openreach in its response to the 2016 PIA Consultation, we find that costs would be below £[<]m per year.

¹²⁰ Under assumptions suggested by Openreach in its response to the 2016 PIA Consultation, we find that costs would be below £[<]m per year.

significant role in the longer term as telecoms providers increasingly serve business connectivity customers in a broader geographical area.¹²¹

- 4.119 We have considered how we should ensure that Openreach's opportunity to recover its efficiently incurred costs is not undermined. Within this review period, we do not think it is necessary to include any allowance for these costs in the WLA charge control given the likely magnitude of the shortfall in cost recovery, and our ability to consider any shortfall in cost recovery in future market reviews.¹²² In the longer term, we will consider the most appropriate approach to ensure that Openreach has an opportunity to recover its efficiently incurred costs as the likely magnitude of the cost recovery impacts become clearer.¹²³

Impact on other end-to-end business connectivity services providers

- 4.120 We acknowledge that other end-to-end providers of business connectivity services may also be affected if the permitted uses of PIA are broadened. For example, they may face a more competitive environment in certain areas, which could affect their ability to retain some of their customers without adjusting prices. For the reasons set out above, we expect the mixed usage rule to mitigate these impacts substantially.
- 4.121 At the same time, infrastructure providers operating in the business connectivity markets may also benefit from broader uses of PIA. In particular, relaxing usage restrictions is likely to enable telecoms providers to deploy networks providing both residential broadband and high quality business connectivity services at lower cost.
- 4.122 Therefore, our provisional view is that our proposal would not have a significant adverse impact.

PIA ancillary services

- 4.123 We have also considered the extent to which it is necessary to require BT to provide facilities and/or services that are necessary to enable and/or support the provision of PIA (known as PIA ancillary services).
- 4.124 A requirement to offer access to ancillary services has the purpose of assisting in promoting competition in downstream markets. Ancillary services are necessary to support the provision and use of PIA. For example, having access to sites where a telecoms provider locates its electronic equipment for the purposes of deploying a network using PIA. In the absence of a requirement to offer ancillary services, a dominant provider would have an incentive not to provide access to those ancillary services in order to render the PIA remedy ineffective.

¹²¹ Even if in the short term telecoms providers using PIA target the very dense areas, this would not be the case in the longer term as the geographic reach of PIA-based networks increases and telecoms providers exhaust those areas with the highest concentration of business customers. Therefore, given that PIA is charged on a per meter basis, we would expect PIA rental revenues to become more significant as deployments expand geographically.

¹²² In Annex 5, we explain that most of the potential impact within the next WLA charge control period is likely to occur in the last year, and after the start of the next review period for the business connectivity markets.

¹²³ Our recent 2016 BCMR Statement recognised that we would be considering allowing PIA to be used for connecting larger businesses as part of our WLA review. We said in the 2016 BCMR Statement that the impact of any such developments on business connectivity markets would also need to be taken account during the next BCMR review (paragraph 7.64 of 2016 BCMR Statement).

- 4.125 The current PIA remedy includes a requirement for BT to provide such PIA Ancillary Services as may be reasonably necessary for the use of PIA. PIA Ancillary Services are defined as an associated facility or service associated with an electronic communications network and/or an electronic communications service which enable and/or support the provision of PIA services via that network and/or service or have the potential to do so. Such services are specified as including at a minimum: power, PIA Co-Location and PIA Co-Mingling (the provision of space and the ability to house equipment in a BT telephone exchange or equivalent), and PIA Site Access (access to equipment that the telecoms provider has in a BT telephone exchange or equivalent).
- 4.126 We consider that an obligation for BT to provide such ancillary services as may be reasonably necessary for the use of PIA continues to be required. We also consider that power, PIA Co-Location, PIA Co-Mingling and PIA Site Access should continue to be specified as ancillary services that BT should be required to provide. We further consider that a new ancillary service, PIA Database Access, should be specified in the network access condition. Our reasons for proposing to require PIA Database Access are set out at paragraphs 6.37 to 6.43 in Section 6 below.
- 4.127 Following on from this, we are proposing in this consultation that BT should be required to provide such PIA ancillary services as may be reasonably necessary for such use of PIA, including as a minimum: power, PIA Co-Location, PIA Co-Mingling, PIA Site Access and PIA Database Access.

Proposed SMP condition

- 4.128 The proposed condition is set out in full at Annex 8.

Legal tests

- 4.129 We consider that the proposed obligation for BT to provide network access to its physical infrastructure, together with such ancillary services as may be reasonably necessary for the use of those services, is appropriate and satisfies the legal tests set out in the Communications Act 2003.
- 4.130 Section 87(3) of the Act authorises Ofcom to set SMP services conditions requiring the dominant provider to give such entitlements as Ofcom may from time to time direct as respects the provisions of network access to the relevant network, the use of the relevant network and the availability of relevant facilities.
- 4.131 In determining which conditions are authorised by section 87(3) to set in a particular case, we must take into account, in particular, the factors set out in section 87(4). In this case we consider that: the economic viability of building alternative access networks means that in the absence of regulatory intervention, it is unlikely there will be significant network build by telecoms providers other than BT; we consider that it is feasible for BT to provide the physical infrastructure access we are proposing to require and we have designed the scope of our proposed requirement with this in mind; we do not consider that our proposal will risk undermining BT's investment made by BT in its network¹²⁴; and we consider that our proposed network access

¹²⁴ While the exact details of the approach to pricing remedies with respect to PIA (and proposed SMP conditions) will be set out in a subsequent consultation document, we set out in Section 7 the approach we anticipate taking.

requirement is an important element of securing economically efficient infrastructure based competition.

- 4.132 We have considered whether our proposed condition, including the extent of the obligation imposed, is justified in light of the objectives set out in the Common Regulatory Framework, transposed into UK law under sections 3 and 4 of the Communications Act 2003.
- 4.133 We consider that the obligations we are proposing are an important element of achieving our duty in section 3 to further the interests of citizens in relation to communications matters and to further the interests of consumers in relevant markets, where appropriate by promoting competition. As explained in section 3, we consider that competition in these markets would be best secured or furthered by our proposed remedy through promoting network competition. In reaching this view, we have also had regard in particular to the desirability of encouraging investment and innovation in relevant markets and the desirability of encouraging the availability and use of high speed data transfer services throughout the UK.
- 4.134 We have also considered all of the Community requirements set out in section 4 of the Act. We consider that our proposed condition, in particular:
- 4.134.1 promotes competition in relation to the provision of electronic communications networks and electronic communications services, and the provision and making available of services and facilities that are provided or made available associated with such networks and services; and
- 4.134.2 encourages the provision of network access and interoperability for the purpose of securing efficiency and sustainable competition, efficient investment and innovation and the maximum benefit for the persons who are customers of communications providers and persons who make associated facilities available.
- 4.135 Section 47(2) requires conditions to be objectively justifiable, not unduly discriminatory, proportionate and transparent. We consider that the proposed condition satisfies these criteria because it is:
- objectively justifiable, in that it facilitates and encourages access to BT's physical infrastructure networks and therefore promotes competition to the benefit of consumers;
 - not unduly discriminatory, as the condition aims to address BT's market power in the market of the UK excluding the Hull Area, in which we provisionally consider that only BT has SMP;
 - proportionate, in that the requirement is necessary, but no greater than necessary, to promote efficient and sustainable competition for the maximum benefit of customers of telecoms providers; and
 - transparent, in that the condition is clear in its intention to ensure that BT provides access to its physical infrastructure and its intended operation should also be aided by our explanations in this document.
- 4.136 For the reasons set out above, we consider that the proposed condition is appropriate to apply to BT to address the competition concerns identified as arising out of BT's SMP, in line with section 87(1) of the Act.

Consistency with EC Recommendations and the BEREC Common Position

- 4.137 In developing our measures, we have taken due account of the NGA Recommendation¹²⁵ and utmost account of the BEREC Common Position¹²⁶. We consider that our proposals are broadly consistent with these measures.
- 4.138 The NGA Recommendation states that, where duct capacity is available, NRAs should mandate access to civil engineering infrastructure (Recommendation 13 of the NGA Recommendation). BP12(c) of the BEREC Common Position is to the same effect.
- 4.139 Recommendation 16 of the NGA Recommendation recommends that NRAs should, in accordance with market demand, encourage (or where legally possible under national law, oblige) the SMP operator, when building civil engineering infrastructure, to install sufficient capacity for other operators to make use of these facilities. While we do not propose to oblige BT to install additional capacity, our approach to relieving congested infrastructure gives BT the incentive to do so.
- 4.140 Recommendation 17 of the NGA Recommendation and BP28 of the Common Position propose the creation of a database containing information on civil engineering infrastructure. For the reasons explained in this section and in Section 6 below, we are proposing to impose a requirement on BT to establish a physical infrastructure database. We consider that the scope of the information to be included in this database is appropriate in the context of the PIA requirement that we are imposing.
- 4.141 In relation to the objective of assurance of co-location at the access point (e.g. MDF, street cabinet, concentration point) and other associated facilities, the BEREC Common Position identifies, among other things, as best practice that:

“**BP16** NRAs should impose obligations with regard to the provision of co-location and other associated facilities on a cost-oriented basis under clear rules and terms approved by the regulator to support viability of the access products mentioned above.

BP16a NRAs should ensure that the remedies allow the optimised use of alternative operators’ existing infrastructures.

BP16b NRAs should ensure that these remedies allow co-location and other associated facilities to be used efficiently. In particular, NRAs should ensure that usage is not artificially segregated by product or market.”

¹²⁵ EC, 20 September 2010. Commission recommendation on regulated access to Next Generation Access Networks (NGA), <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF>.

¹²⁶ BEREC, 8 December 2012, Revised BEREC Common Position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market (BoR (12) 127), http://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/1127-revised-berec-common-position-on-best-pr_0.pdf

4.142 We discuss our pricing proposals in Section 7 of this consultation. We consider that our proposals are consistent the best practice set out in the BEREC Common Position.

Consultation questions

Question 4.1: Do you agree with our proposals for a specific access obligation, which includes an obligation on BT to make adjustments to its physical infrastructure when its network is congested? Please provide reasons and evidence in support of your views.

Question 4.2: Do you agree with our proposals on the scope of PIA: (1) To broaden usage through a mixed usage generic rule; (2) To modify the PIA condition to define geographic scope by reference to telecoms providers' local access networks. Please provide reasons and evidence in support of your views.

Section 5

Non-discrimination requirements

Introduction

- 5.1 In this section we explain why achieving a level playing field between BT and other telecoms providers is important, and we set out how we propose to achieve this.
- 5.2 Specifically, we set out our proposed requirement on BT not to unduly discriminate in the supply of passive infrastructure access. This remedy, in conjunction with the other remedies proposed in this consultation, is designed to address the competition concerns that we have provisionally identified in our market analysis associated with a finding of SMP and published in the 2017 WLA MR Consultation.

Current remedy

- 5.3 BT is currently prohibited from unduly discriminating in relation to the provision of network access in the form of PIA in the WLA market. However, BT is not subject to a specific requirement to provide network access to PIA on an Equivalence of Inputs (EOI) basis.
- 5.4 This is because when we first introduced a duct access remedy we believed that imposing EOI on BT in the provision of duct access would require BT to significantly re-engineer its own internal processes and systems, and therefore would not be proportionate.¹²⁷

Aims and effect of regulation

- 5.5 Through the Communications Act 2003 we have the powers to address issues of discrimination, where a company with market power can hinder other companies' ability to compete. Section 87(6)(a) of the Act gives us a power to impose "a condition requiring the dominant provider not to discriminate unduly against particular persons, or against a particular description of persons, in relation to matters connected with network access to the relevant network or with the availability of the relevant facilities". We consider any conditions imposed pursuant to this power require equivalence as per Article 10(2).¹²⁸
- 5.6 A non-discrimination obligation is intended as a complementary remedy to the network access obligation, principally to prevent the dominant provider from discriminating in favour of its own downstream divisions and to ensure that competing providers are placed in an equivalent position. 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.

¹²⁷ See the 2010 WLA Statement, paragraph 7.86 to 7.89.

¹²⁸ This position is supported by our 2005 guidance on Undue discrimination by SMP telecoms providers where we state at paragraph 1.1 that "in wholesale markets Requirements not to unduly discriminate (under the Act) have the same meaning, and describes the same concept, as an obligation of non-discrimination (under the [Access] Directive)" (Ofcom, 15 November 2005. *Undue discrimination by SMP providers*, https://www.ofcom.org.uk/_data/assets/pdf_file/0021/46038/contraventions4.pdf).

- 5.7 Non-discrimination can have different forms of implementation. A strict form of non-discrimination – i.e. a complete prohibition of discrimination – would result in the SMP operator providing the same products and services to all telecoms providers (including its own downstream divisions) on the same timescales, terms and conditions (including price and service levels), by means of the same systems and processes and by providing the same information. Essentially, the inputs available to all telecoms providers (including the SMP provider’s own downstream divisions) would be provided on a truly equivalent basis, an arrangement which has become known as equivalence of input, or EOI. An EOI obligation removes any degree of discretion accorded to the nature of the conduct.
- 5.8 In certain cases, a less strict interpretation of non-discrimination may be appropriate, to allow for flexibility and a more practical or cost-effective provision of wholesale inputs. Such a requirement might take a variety of forms. For example, it might include a strict equivalence requirement but with exceptions for circumstances where discrimination is objectively justified all the way through to equivalence of outcome (EOO). EOO requires the provision of all wholesale inputs to access seekers in a manner which is comparable, in terms of functionality and price, to those the SMP operator provides to its own downstream businesses, albeit using potentially different systems and processes.¹²⁹
- 5.9 Article 10 of the Access Directive, as implemented by section 87(6)(a) of the Act, provides a basis for imposing both EOI and less strict interpretations of non-discrimination.

2016 PIA Consultation

- 5.10 In the Strategic Review we said that to improve Openreach’s incentives to deliver an effective DPA product, we would work to apply equivalence of inputs to Openreach’s provision of DPA, requiring Openreach to provide DPA to all telecoms providers (including other parts of BT) in the same way. This would require Openreach to provide DPA to all telecoms providers (including other parts of BT) on the same timescales, terms and conditions, and by means of the same systems and processes. We noted that we would expect only to consider exceptions to this where it would result in a disproportionate level of costs being incurred, such as in relation to certain existing network infrastructure as opposed to where new network assets are deployed.
- 5.11 We noted that when Openreach uses its physical infrastructure as an input to other products, it does not do so by consuming the existing PIA product. Therefore, introducing EOI to PIA would require Openreach to productise the use of duct at scale, suitable for consumption by both BT and other telecoms providers.
- 5.12 Moreover, we noted that because PIA is not a single standard product but comprises several processes and sub-products,¹³⁰ ensuring EOI for PIA would require EOI at each stage of the process that Openreach and other telecoms providers undertake. This would mean that Openreach would be required to re-engineer its own internal

¹²⁹ Ofcom, 15 November 2005. Undue discrimination by SMP providers.

¹³⁰ The PIA product comprises (i) a set of processes, systems and interactions with Openreach to allow the telecoms provider to plan its own network; (ii) multiple sub-products (e.g. ducts, poles, chambers) that can be ordered to deploy a network; and (iii) a set of technical rules that must be followed relating to deploying its network using Openreach's infrastructure.

processes and systems significantly if it consumed its physical infrastructure on a completely equivalent basis.¹³¹

- 5.13 We therefore suggested that we would not propose to impose a full EOI obligation on BT to consume PIA as an input to other services. However, since our concern remained that other network operators should not be disadvantaged when competing with BT, particularly in the deployment of new ultrafast broadband networks given our strategic focus, we considered what form of non-discrimination remedy might be required to address such a concern.
- 5.14 We suggested that one option might be that when Openreach installs ultrafast broadband services itself at scale (for example, when extending its G.fast service beyond its current cabinet footprint or deploying FTTP), Openreach should be required to consume its physical infrastructure on a strictly equivalent basis using the same processes and systems as those used by other telecoms providers that consume PIA, as far as is practicable. This would include database access, systems reservation processes and billing.
- 5.15 In the 2016 PIA Consultation, we did not consider that BT should be required to consume its physical infrastructure on a completely equivalent basis, but said we would apply a principle of equivalence with the aim of ensuring that other telecoms providers are not at a material disadvantage compared to Openreach's own internal consumption of duct and pole access. This principle of equivalence is important because where differences in processes mean that a competing telecoms provider faces extra cost, time or uncertainty, this would undermine the effectiveness of the PIA remedy.
- 5.16 In developing our views in the 2016 PIA Consultation we examined the existing PIA processes and compared this to the approach Openreach follows internally. We focussed our attention on two main areas of equivalence, which we thought were critical to the effectiveness of the PIA remedy:
- 5.16.1 equivalence in processes; and
 - 5.16.2 equivalence in cost recovery and charges.
- 5.17 We identified several areas where, due to their inability to use PIA for scale deployments, other telecoms providers appear to be at a significant disadvantage to BT's own downstream business. These disadvantages are:
- 5.17.1 **Usage restrictions:** telecoms providers are unable to use PIA to provide services to larger businesses, limiting the business models they can adopt;
 - 5.17.2 **Lack of network planning information:** other telecoms providers do not have access to the same information as BT about the location of Openreach's ducts and what spare capacity they may have;
 - 5.17.3 **Processes not fit for scale use:** telecoms providers face burdensome processes when using Openreach's ducts, leading to delays, higher costs and uncertainty around the timing of network build; and

¹³¹ We also said that imposing a full equivalence of inputs remedy might lead to the need to impose an additional regulatory boundary within Openreach.

- 5.17.4 **Upfront costs:** when using duct for its own internal purposes, BT recovers the build and repair costs across all services which use the duct over a long time period. In contrast, other telecoms providers currently pay up front for the build or repair of Openreach's ducts they intend to use, and then gift these improved assets to Openreach.
- 5.18 These remain important areas of focus and in Sections 6 and 7 we explain how we propose to address these disadvantages.

Stakeholder responses to the 2016 PIA Consultation

- 5.19 Overall stakeholders were supportive of our proposals, with no stakeholder saying that we should not apply a principle of equivalence. However, stakeholders were divided on the degree of equivalence that it might be appropriate to impose. This range of views was typically reflected in concerns over how equivalence should be implemented: some stakeholders felt equivalence should only be applied when justified, while others felt equivalence should be applied in all situations and exceptions only granted when justified.
- 5.20 Those stakeholders who supported the imposition of EOI, were split as to whether it should apply to all products that consume duct access, or only to new products such as FTTP. In general, those who supported EOI across all products did so as they felt this was the only way to ensure Openreach is unable to discriminate in favour of its own downstream products. Those who were more supportive of EOI applied to new products explained they felt this would be a more proportionate and practical solution.
- 5.21 Whilst there was support in general for the principle of equivalence, Openreach opposed EOI as a remedy on the grounds of effectiveness and proportionality.
- 5.22 In responding to the issue of equivalence in cost recovery and charges, some stakeholders expressed concerns that our suggestion to pass the costs of build and enablement to Openreach, while others argued that only by ensuring Openreach was responsible for recovering all costs would PIA become effective. This issue is discussed in Section 7.
- 5.23 Finally, although all stakeholders agreed that costs and processes were a necessary focus, they questioned why other factors such as contract length, ongoing maintenance or wayleaves were also not prioritised.

Our Proposals

The importance of non-discrimination to ensuring a level playing field in downstream markets

- 5.24 As discussed in Section 3, the identified competition problem means that ensuring a level playing field in downstream markets is necessary to ensure an effective PIA remedy. This is because without a level playing field BT could engage in practices that could distort downstream competition, including providing access, but on less favourable terms compared to those obtained by its own downstream businesses. This could further worsen consumer outcomes as the benefits from other telecoms providers deploying ultrafast networks may not be realised.
- 5.25 Imposing a non-discrimination requirement on BT would help address this competition problem. Among other reasons, this is because an effective PIA remedy

requires other telecoms providers to choose to compete with BT, while also relying on BT to provide duct access that will enable this competition. Since this leads to a conflict in incentives for BT, other telecoms providers need to have confidence that they can use PIA on competitively fair terms. Without confidence that a level playing field will be maintained these potential competitors are unlikely to invest at scale.

- 5.26 Therefore, an effective PIA remedy requires BT being prevented from discriminating, distorting or restricting competition, both on a price and non-price basis. This will help ensure a level playing field on which other telecoms providers can compete with BT.
- 5.27 Consequently we consider that it is appropriate to impose some form of non-discrimination obligation on PIA network access.
- 5.28 In practice, if a downstream BT division, such as BT Consumer, was to deploy its own broadband fibre network using BT's ducts and poles, it would access this infrastructure using the same PIA product as any other competing telecoms provider; it would effectively be subject to EOI. BT's recent agreement to reform Openreach to become a legally separate company within BT Group will strengthen the independence of Openreach from downstream BT divisions. However, BT's FTTC and FTTP broadband fibre networks are currently deployed by Openreach, and so our focus is on ensuring that Openreach does not have an unfair advantage over competing network builders.
- 5.29 Our starting point is that to achieve a level playing field it is necessary to impose broad equivalence. However, in imposing a non-discrimination remedy and ensuring other telecoms providers are not at a disadvantage to BT, we need to take care that the remedy itself is not so costly or disruptive to BT, or takes so long to impose, that the remedy fails to level the playing field, or even tilts it the other way. Therefore, we consider below the precise form of non-discrimination obligation which we provisionally conclude is appropriate to impose in the context of this market.

Equivalence of Input (EOI)

- 5.30 We consider that a non-discrimination obligation in the form of EOI is the most appropriate form of non-discrimination obligation to impose where there are concerns that a dominant provider will discriminate in respect of network access.¹³² This is because EOI generates better incentives on the dominant undertaking to improve the products it offers to its competitors, and it increases transparency. It therefore offers greater potential to address the issue of inequality of access in a sustainable fashion.
- 5.31 However, because EOI does not allow any discrimination at all, it may not be appropriate in circumstances where network access involves legacy products and processes which might need to be re-engineered to meet the requirement.
- 5.32 In our 2016 PIA Consultation, we noted that introducing EOI to PIA and requiring BT to use PIA for *all* products and services that consume duct access, would require BT to re-engineer its own internal processes and systems. This therefore may be costly and disruptive, and would likely take considerable time.

¹³² The concept of EOI was identified in Ofcom's 2004-2005 Strategic Review of Telecommunications as one of our key policy principles to ensure that regulation of the telecommunication markets is effective - Ofcom, November 2004. *Strategic Review of Telecommunications – Phase 2 consultation document*, Section 6, http://stakeholders.ofcom.org.uk/binaries/consultations/telecoms_p2/summary/maincondoc.pdf.

- 5.33 Considering the responses from stakeholders, we remain of the view that requiring BT to use PIA for *all* products and services that consume duct access in the WLA market would not be proportionate at this stage. Consequently, we have considered the extent to which a more limited form of non-discrimination might be appropriate.
- 5.34 One possibility would be to impose EOI for a specific sub-set of BT's activities on a forward-looking basis. Given our strategic focus is on the deployment of new ultrafast broadband networks we have considered whether we should impose EOI but limit its application *only* to BT's use of PIA for products and services that consume duct access for deploying new ultrafast broadband networks, for example, G.fast services beyond its current cabinet footprint or the deployment of FTTP services.
- 5.35 However, having considered this, we are concerned that the following issues may emerge:
- 5.35.1 Potentially complex boundaries may be needed inside Openreach to ensure EOI is applied appropriately. In particular we foresee the need for a boundary between the supply of duct access for ultrafast broadband services and for other products, and an additional boundary between downstream ultrafast broadband products and other Openreach products. These boundaries could lead to complexity and the risk of regulatory failure as, for example, roles that are currently combined would have to be separated, potentially leading to a loss in existing efficiency attributable to vertical integration.¹³³ Monitoring compliance of these boundaries may be difficult and lead towards a type of functional separation, where for example a network planner must use different systems with different logins, depending on the reason why they are considering duct access.
- 5.35.2 Additionally, we believe EOI would be most effective when both BT and other telecoms providers have aligned requirements for a workable duct access product. Since BT's own demand for a duct access product to support FTTP fibre deployment is not fully established there is a risk that the incentives EOI introduces will differ between BT and other telecoms providers, and may undermine the effectiveness of the EOI requirement.¹³⁴ Furthermore, in such a situation, an EOI requirement may even incentivise BT to reduce the deployment of its own FTTP services compared to what might otherwise have been the case.

Other forms of non-discrimination

- 5.36 In light of the above, we are therefore proposing to impose a non-discrimination requirement that falls short of the strict equivalence of EOI. We have considered imposing either a more comprehensive internal EOI (e.g. across all products) or partial EOI obligation across FTTP and G.fast services beyond the cabinet. However, while for the reasons set out above we do not think such an approach is currently a viable remedy, we maintain that any non-discrimination requirement we propose

¹³³ For example, currently a single Openreach planner coordinates the supply of duct access for FTTP and other products with the demand for FTTP ducts access and the demand for duct access from other products. An EOI remedy would require this role to be separated.

¹³⁴ BT has in general prioritised the roll-out of G.fast to the cabinet, making use of fibre that has already been installed for superfast services, over the roll-out of FTTP or G.fast beyond the cabinet.

should be as close to EOI as possible since this is required in order to ensure a level playing field in downstream markets leading to an effective PIA remedy.

- 5.37 Consequently, we are proposing to impose a no undue discrimination SMP condition on BT. While this condition does permit discrimination in certain circumstances, we propose to interpret the condition as requiring strict equivalence in respect of all processes and sub-products that contribute to the supply and consumption of duct access, unless BT can demonstrate that a difference in respect of a specific process step or sub-product is justified.^{135 136}
- 5.38 To the extent that differences can be justified, such that a process that other telecoms providers are required to follow to access Openreach's physical infrastructure differs from one BT follows itself, this condition would still require equivalence more broadly. This equivalence would be in the sense that this must not put the third-party telecoms provider at a disadvantage particularly in terms of extra cost, time or uncertainty, compared to the processes BT follows internally.
- 5.39 Furthermore, we would expect as part of complying with this requirement for non-discrimination that when BT establishes new processes or platforms that contribute to the supply and consumption of duct access, these should be designed and implemented from the outset such that they are equivalent. We envisage that in order to comply with the non-discrimination requirement, new platforms and / or processes used by BT would not differ to those used by other telecoms providers, other than in the most exceptional circumstances.
- 5.40 Complying with this requirement for non-discrimination would mean that when Openreach incurs internal costs related to duct and pole access, it recovers these in a comparable way to the costs associated with PIA, rather than from downstream services where it has SMP.
- 5.41 This proposed approach to non-discrimination provides for a degree of flexibility to Openreach, allowing it to maximise the efficiencies available in providing duct access, while preventing it from disadvantaging other telecoms providers. For example, Openreach would be able to consider demand for duct capacity arising from across all its products, including FTTP, when designing and maintaining or upgrading ducts.
- 5.42 Furthermore, this approach should also reduce the direct costs of complying with a non-discrimination condition. For example, currently Openreach's planners use an integrated software platform which both captures duct availability data, and uses

¹³⁵ In Chapter 3 of our Access Guidelines we explain that the aim of a no undue-discrimination condition is to ensure that a vertically integrated SMP operator does not treat itself in a way that benefits itself, its subsidiaries or its partners in such a way as to have a material adverse effect on competition. Furthermore, we explain that: "In order to ensure compliance with its obligations as regards non-discrimination under the AID [Access and Interconnection Directive], in general, an SMP operator should ensure that: a) it applies equivalent conditions in equivalent circumstances to other undertakings providing equivalent services and provides services and information to others under the same conditions and of the same quality as it provides for its own services, or those of its subsidiaries or partners; and b) it can objectively justify any differentiation". While our 2005 guidance was focused on concerns about non-price differences, we are proposing to extend this approach in the context of our PIA remedy to include price differences as well.

¹³⁶ We consider that our proposed approach does not prevent Openreach from entering into certain types of co-investment arrangements with other telecoms providers. To the extent that any particular form of co-investment by Openreach and another telecoms provider might be restricted, there is scope for us to disapply the obligation in appropriate circumstances.

algorithms to suggest optimal routes for network deployment. Enforcing a strict form of non-discrimination would require the separation of the planner's role into two parts and new systems would need to be built and processes designed, which would take time to implement and potentially be costly.

- 5.43 Given the importance of non-discrimination in this context, in particular, in creating an environment in which competing providers have the confidence to make very substantial capital investments relying on access to BT's duct and pole network, we consider that we should impose an obligation on BT to provide transparency around non-discrimination. Specifically, we are proposing to impose a requirement on BT to publish such information on non-discrimination as we may direct. We are considering whether to propose key performance indicators (KPIs) on non-discrimination. The KPIs we envisage would require BT to publish data necessary to allow the comparison of the supply and consumption of duct access by external telecoms providers as compared to Openreach's own internal consumption. We will consider what requirements (if any) it might be appropriate for BT to report as KPIs once Openreach has published any revised internal Reference Offer (assuming that we maintain our proposals on this post consultation).

Legal tests

- 5.44 For the reasons set out below, we are satisfied that the proposed condition for BT in the WLA market in the UK excluding the Hull Area meet the various tests set out in the Act.
- 5.45 Section 87(6)(a) of the Act authorises the setting of an SMP services condition requiring the dominant provider not to discriminate unduly against particular persons, or against a particular description of persons, in relation to matters connected with network access to the relevant network or with the availability of relevant facilities. Section 87(6)(b) of the Act authorises the setting of an SMP services condition requiring the dominant provider to publish, in such manner as we may direct, all such information as they may direct for the purpose of securing transparency in relation to such matters.
- 5.46 We have considered our duties under section 3 and all the Community requirements set out in section 4 of the Act. In particular, the condition is aimed at promoting competition and securing efficient and sustainable competition for the maximum benefit of consumers by preventing BT from leveraging its SMP through discriminatory behaviour into related downstream markets.
- 5.47 We also consider that the proposed condition meets the criteria in Section 47(2) of the Act which require conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. The proposed condition is:
- objectively justifiable, in that it provides safeguards to ensure competitors, and hence consumers, are not disadvantaged by BT discriminating in favour of its own downstream activities or between competing providers;
 - not unduly discriminatory, in that the condition is proposed to apply to BT which is the only telecoms provider which we propose to find has SMP in the WLA market in the UK excluding the Hull Area;
 - proportionate, in that it seeks to prevent discrimination that would adversely affect competition and ultimately cause detriment to consumers; and

- transparent, in that the condition is clear in what it is intended to achieve.

5.48 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The EC recommendations and BEREC Common Position

5.49 We have taken due account of the EC's Costing and Non-discrimination Recommendation in reaching our decision to impose a no undue discrimination condition on BT.¹³⁷ There are three recommendations relevant in this regard:

- a) that where EOI is disproportionate, National Regulatory Authorities (NRAs) should ensure that the SMP operator provides wholesale inputs on at least an EOO basis;
- b) that NRAs should ensure that when a non-discrimination obligation is imposed, access seekers can use the relevant systems and processes with the same degree of reliability and performance as the SMP operators' own downstream retail arm; and
- c) that NRAs should require SMP operators subject to a non-discrimination obligation to provide access seekers with regulated wholesale inputs that allow the access seeker to effectively replicate technically new retail offers of the downstream retail arm of the SMP operator, in particular where EOI is not fully implemented.

5.50 We consider that the no undue discrimination obligation which we are proposing to impose is consistent with these recommendations.

5.51 Point 19 of that recommendation also provides that when imposing non-discrimination obligations, NRAs should impose KPIs in order to monitor effectively compliance with the non-discrimination obligation. As outlined above we are proposing a non-discrimination obligation and a power to impose KPIs. While we are not currently proposing to implement KPIs relating to the PIA obligation we will consider what requirements (if any) it might be appropriate for BT to report as KPIs once Openreach has published any revised internal Reference Offer (assuming that we maintain our proposals on this post consultation).

5.52 We have also taken utmost account of the BEREC Common Position. In relation to achieving the objective of a level playing field, the BEREC Common Position identifies, among other things, as best practice that:¹³⁸

¹³⁷ EC, September 2013. *Commission recommendation of 11.9.2013 on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment*, (September 2013 EC Recommendation on non-discrimination obligations) http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2013/c_2013_5761_en.pdf.

¹³⁸ In this respect, the BEREC Common Position identifies the following competition issues which arise frequently: SMP players having an unfair advantage; having unmatchable advantage, by virtue of their economies of scale and scope, especially if derived from a position of incumbency; discriminating in favour of their own group business (or between its own wholesale customers), either on price or non-price issues; exhibiting obstructive and foot-dragging behaviour.

“BP19 NRAs should impose an obligation on SMP CPs requiring equivalence, and justify the exact form of it, in light of the competition problems they have identified.

BP19a NRAs are best placed to determine the exact application of the form of equivalence on a product-by-product basis. For example, a strict application of EOI is most likely to be justified in those cases where the incremental design and implementation costs of imposing it are very low (because equivalence can be built into the design of new processes) and for certain key legacy services (where the benefits are very high compared to the material costs of retro-fitting EOI into existing business processes). In other cases, EOO would still be a sufficient and proportionate approach to ensure non-discrimination (e.g. when the wholesale product already shares most of the infrastructure and services with the product used by the downstream arm of the SMP operator).”

- 5.53 We have further taken due account of the EC’s 2010 NGA recommendation.¹³⁹ Point 13 of the recommendation provides that where duct capacity is available, NRAs should mandate access to civil engineering infrastructure and this access should be provided in accordance with the principle of equivalence as set out in Annex II. While we are proposing to interpret the proposed non-discrimination obligation as requiring strict equivalence, differences are permitted where it can be demonstrated that it strict equivalence is not justified. To the extent that this means that PIA is provided on terms falling short of the principle of equivalence, we consider that this is justified by UK national circumstances for the reasons set out in this section.

Consultation question

Question 5.1: Do you agree with our proposed imposition of a no undue discrimination SMP condition on BT? Please provide reasons and evidence in support of your views.

¹³⁹ EC, October 2010, Commission Recommendation 25.9.2010 on regulated access to Next Generation Access Networks (NGA) (2010 EC Recommendation on NGA) <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32010H0572&from=EN>

Section 6

Improvements to PIA process and systems

Introduction

- 6.1 In this section we set out our proposals for improving the processes and systems for PIA. The section is broadly structured around the key stages of deploying an access network rather than by reference to a proposed obligation. Consequently, our proposals cover a number of different requirements, some of which are also discussed elsewhere in this consultation.
- 6.2 Some of our proposals in this section supplement our proposals in Section 4 and Section 5 relating to BT's network access requirements and BT's non-discrimination obligations respectively, in some cases providing more detail on those requirements.
- 6.3 We also set out proposals to require BT to publish a PIA Reference Offer, including specifying what should be included in that PIA Reference Offer as a minimum. This Reference Offer requirement sets out those areas that as a minimum must be included in the contract on which other telecoms providers purchase PIA.

Developments to the PIA product since the publication of our 2016 PIA Consultation

- 6.4 In the 2016 PIA Consultation, we referred to Openreach's engagement with an industry working group, and five smaller telecoms providers to improve the PIA process by running a Proof of Concept trial that was due to be completed at the end of 2016. Following the end of the trial, Openreach announced¹⁴⁰ that the process changes piloted under its Proof of Concept trial would become business as usual for all telecoms providers with effect from 3 January 2017.¹⁴¹
- 6.5 The process changes implemented from 3 January 2017 included:
- *Service establishment and accreditation changes:* For example, relaxation of the requirement for telecoms providers to hold Code Powers and to have ISO9001 certification. In addition, at the February 2017 Passives Industry Working Group (PIWG) meeting, Openreach announced further changes to the accreditation processes. Under the revised arrangements Openreach will no longer maintain a register of personnel accredited to work on its infrastructure. Instead each telecoms provider is responsible for maintaining their own register of accredited personnel.
 - *Planning and surveying changes:* For example, relaxation of the requirement for telecoms providers to measure cables and submit duct space calculations to Openreach; extending the reservation period to six months; and allowing telecoms providers to undertake a survey and deploy their network using BT's

¹⁴⁰ Openreach briefing GEN001/17, 3 January 2017.

¹⁴¹ Telecoms providers could use the processes from 3 January 2017 under the Proof of Concept trial terms and a temporary waiver of certain contractual terms. The changes to the main PIA contract took effect from 4 April 2017.

infrastructure in a single stage (as opposed to requiring a survey to be completed by the telecoms provider, and subsequently approved by Openreach, in advance of any network deployment).

- *Network deployment changes:* For example, allowing a telecoms provider some flexibility to make deviations from the originally agreed route when deploying a network without first seeking Openreach's approval e.g. in response to finding obstacles; allowing telecoms providers to undertake certain civils work;¹⁴² allowing telecoms providers greater flexibility to use BT's ducts;¹⁴³ and allowing telecoms providers to undertake work outside normal working hours.¹⁴⁴

6.6 In addition to changes to the PIA process, on 30 January 2017, Openreach also introduced an online mapping tool (PIA Digital Map Tool) that provides the location of its duct and pole infrastructure removing the need for telecoms providers to request printed maps.¹⁴⁵ On 31 March 2017, Openreach increased the functionality of the PIA Digital Map Tool to include a business-to-business system interface that allows telecoms providers to transfer infrastructure information into their own Geographic Information System (GIS) planning tools and to provide telecoms providers with a view of duct capacity, split by ducts over 70% full, ducts over 50% full but less than 70% full, and ducts less than 50% full.^{146 147} Openreach plans a further update in May 2017 that will provide functionality to allow telecoms providers to export infrastructure information from the PIA Digital Map Tool to spreadsheet order forms reducing the need to copy information manually.¹⁴⁸

6.7 We acknowledge the steps undertaken (and planned) by Openreach to improve the PIA product through engagement with industry. We consider that these represent an important step forwards. The proposals that we set out in this section are considered in light of the changes made to PIA since our 2016 PIA Consultation.

Overview of stages in deploying an access network

6.8 The activities required to deploy an access network can be broadly categorised into three main stages: planning and surveying; network deployment; and connecting to the customer. Telecoms providers using PIA are also required to complete a contractual engagement stage known as service establishment before using PIA. As part of this the telecoms provider must fulfil a set of accreditation requirements and sign a PIA contract. Following the deployment of a network, a telecoms provider is also likely to undertake activities relating to the maintenance and fault repair of the network to ensure that it is working effectively. We represent these in Figure 6.1 below.

¹⁴² Duct blockage clearance, duct repair, joint box breakthrough and installation of pole brackets.

¹⁴³ Under the revised rules, telecoms providers may: install a wider range of joints in BT's joint boxes, including distribution joints; install cables directly in BT's ducts without sub-ducting as previously required; and join their ducts directly to BT's jointing chambers.

¹⁴⁴ Previously work was required to be completed in normal business days/hours.

¹⁴⁵ Openreach briefing GEN007/17, 30 January 2017

<https://www.openreach.co.uk/orpg/customerzone/updates/briefings/general/gen00717.pdf>

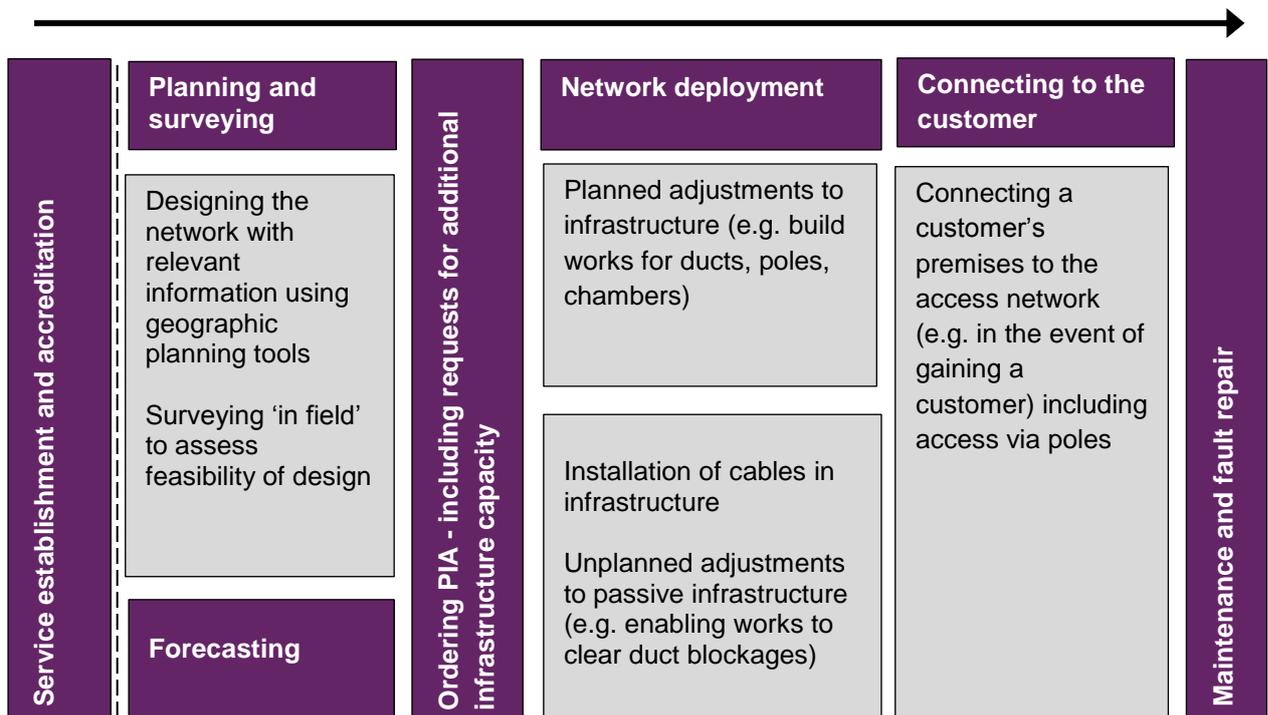
¹⁴⁶ Ducts less than 70% full should normally be able to accommodate an additional 25mm subduct.

¹⁴⁷ Openreach briefing GEN021/17, 20 March 2017

<https://www.openreach.co.uk/orpg/customerzone/updates/briefings/general/gen02117.pdf>

¹⁴⁸ Openreach response to 2016 PIA Consultation, page 31.

Figure 6.1: Key stages of an access network deployment using PIA



6.9 We use these main stages as a framework to examine the PIA processes; the potential issues associated with those processes (including an assessment of stakeholder evidence provided in response to our 2016 PIA Consultation); and to provide our proposals for improving PIA.

PIA service establishment and accreditation

6.10 Before a telecoms provider can purchase PIA, it must pass a service establishment and accreditation stage. In respect of this, the current PIA Reference Offer requires that such conditions are set out clearly to provide transparency for those telecoms providers seeking access. Specifically, there is a requirement in the existing PIA Reference Offer to include:

- conditions for Third Parties to gain access to Physical Infrastructure including if appropriate training, certification and authorisation requirements for personnel to access and work in/on Physical Infrastructure.

6.11 As part of our review, we have examined the service establishment and accreditation process, including the extent to which this obligation continues to be appropriate.¹⁴⁹

6.12 Service establishment is a contractual engagement process that is the first stage in gaining access to BT's infrastructure. Once a telecoms provider is established, it can access Openreach's duct and pole database. Telecoms providers only have to complete this process once. Completion of this stage is contingent on telecoms

¹⁴⁹ Although we did not discuss issues relating to this existing requirement in our 2016 PIA Consultation, issues around Openreach's existing accreditation process were raised by a small number of stakeholders.

providers signing Openreach's PIA contract and meeting various contractual requirements such as demonstrating that they have public liability insurance.¹⁵⁰

- 6.13 Openreach requires that all operatives working on BT's infrastructure network must be accredited to Openreach's standards for the tasks performed, for example training in the use of a gas monitor when working in a BT inspection chamber.¹⁵¹ Accreditation is awarded on an individual operative basis following an assessment of the material covered in the module. Proof of accreditation must be carried by operatives when working on BT's infrastructure network (allowing Openreach to facilitate accreditation audits if required).¹⁵²
- 6.14 Accreditation operates by a 'train the trainer' scheme whereby telecoms providers and contractors can employ their own Assessors or Lead Assessors to accredit operatives independently of Openreach. Telecoms providers must establish an auditing process to ensure that the quality of work continues to meet standards and Openreach currently reserves the right to audit operatives' work.
- 6.15 We believe that conditions, including appropriate training, certification and authorisation requirements for other telecoms providers' personnel to gain access to BT's infrastructure remain necessary to maintain engineering standards across BT's infrastructure network. In order that such requirements are clear to all telecoms providers seeking access, we propose that these should continue to be set out in the PIA Reference Offer. Therefore, we propose that the PIA Reference Offer continues to include:
- conditions for Third Parties to gain access to Physical Infrastructure including if appropriate training, certification and authorisation requirements for personnel to access and work in/on Physical Infrastructure.
- 6.16 CityFibre and Flomatik were concerned that the accreditation process as it stood in January 2017 was too complex and cumbersome to navigate, and CityFibre observed the potential for a 'bottleneck' to form around accreditation and interfere in scaled network deployment.¹⁵³
- 6.17 While it is open to us to specify the terms and conditions relating to establishment and accreditation on which Openreach offers PIA, our provisional view is that it would not be appropriate for us to do so currently. As noted above, since the publication of our 2016 PIA Consultation, Openreach has made several changes to the service establishment and accreditation processes. Openreach is also working with telecoms providers to develop new accreditation modules that are better suited to PIA and to determine whether other accreditation modules often held by contractors would be suitable for PIA.¹⁵⁴ We also note that once an initial trainer has been accredited

¹⁵⁰ Duct and pole access – Physical Infrastructure Access (PIA) Process Description, Issue 4.1, 7 February 2017.

¹⁵¹ A list of accreditation modules can be found on the Openreach website Duct and Pole Sharing Quality Accreditation Guidelines, Issue 1.3, 7 February 2017.

¹⁵² When working on BT's infrastructure, telecoms providers must notify Openreach of their operatives' whereabouts three days in advance. This allows Openreach to coordinate its own operatives and to provide a record for both the telecoms provider and Openreach should any damage or highway breach occur.

¹⁵³ CityFibre response to the 2016 PIA Consultation, page 2.

¹⁵⁴ Openreach gave a presentation at the Passives Industry Working Group on 15 February 2017 relating to this.

within a telecoms provider, the number of accredited operatives can rapidly increase using a train the trainer approach.

Forecasting

- 6.18 Under the current arrangements for PIA, Openreach includes a contractual requirement for accredited telecoms providers to submit a forecast for the forthcoming three months of how much duct and how many poles are likely to be ordered; and how much enabling work will be required, for each exchange area.¹⁵⁵ Openreach state that any actual demand in excess of 20% over forecast will not be subject to the normal service delivery timescales.¹⁵⁶
- 6.19 Given this, we have considered what requirements it might be appropriate to include in respect of forecasting, including in the PIA Reference Offer (where there is no current requirement in respect of forecasting).
- 6.20 Our view is that, in principle, a requirement on telecoms providers to submit forecasts of their PIA usage will be important in assisting Openreach to plan its resources. It is also important that such requirements are clearly set out so that there is transparency for all telecoms providers. Consequently, we propose that the PIA Reference Offer should include:
- conditions for the provision of forecasts by Third Parties in respect of their future requirements for PIA.
- 6.21 We do not propose to prescribe the specific terms and conditions that should be included in any revised forecasting process and our view is that industry and Openreach are well placed to take forwards the precise information that a telecoms provider should provide in relation to this.
- 6.22 However, we acknowledge that given the proposals that we are making in this document, changes may be required to the current forecasting process in relation to PIA. For example, forecasts of the expected number of customer connections may be relevant in light of our proposals regarding providing capacity on poles. In addition, some of the forecast information that is currently required may be challenging to forecast with reasonable accuracy, or unnecessary for Openreach's own resource planning, and may therefore need to be reviewed. For example, the amount of enabling work required per order, or forecasts provided on an exchange by exchange basis rather than on a region by region basis.¹⁵⁷
- 6.23 We would note more broadly that the non-discrimination obligations we propose in Section 5 will mean that the process and data gathered for forecasting duct and pole demand for telecoms providers under PIA should be equivalent to the forecast requirements used by Openreach itself, for the purposes of deploying its own fibre broadband services unless such differences can be justified. This approach ensures that a third-party telecoms provider would not be put at a disadvantage in terms of extra cost, time or uncertainty, compared to the processes Openreach follows internally.

¹⁵⁵ The telecoms provider is also required to state the month in which the order will be made.

¹⁵⁶ In the 2016 PIA Consultation we did not directly address the role of forecasts as part of the PIA process, and no stakeholder responded on this issue.

¹⁵⁷ Openreach, in general, organises its national engineering resource across ten regions.
<https://www.homeandwork.openreach.co.uk/help-and-support/our-responsibilities.aspx>

6.24 Furthermore, as outlined above, any information provided to Openreach for the purposes of negotiating network access is protected through the requirements set out in General Condition (GC) 1.2. Openreach is required to treat any information provided to it for these purposes in confidence, not passing it to any other part of Openreach where it could provide a competitive advantage. We would therefore expect to see any forecasts provided by PIA users suitably anonymised and treated by Openreach as part of its internal workflow processes for other duct and pole build works.

Planning and surveying

Overview of planning and survey processes

- 6.25 To plan access networks using PIA, telecoms providers need access to Openreach's duct and pole network records including: information about the location of ducts, joint boxes, manholes and poles; descriptive information about assets such as joint box sizes; and where available, information about the extent of spare capacity to accommodate the telecoms providers' networks.¹⁵⁸
- 6.26 On completion of the planning stage a telecoms provider will be able to enter an agreement with Openreach to deploy its network using PIA and begin its field engineering activities.

2016 PIA Consultation

- 6.27 In our 2016 PIA Consultation, we identified several problems that a telecoms provider using PIA faced which Openreach did not face as part of its own planning activities and which we considered made PIA unsuitable for scale use. In summary, these were:
- *Format of network records and capacity information:* records are supplied to telecoms providers as JPEG images (screen prints from Openreach's network records system) rather than a GIS format that could be imported into a telecoms provider's planning tools. Furthermore, the information that Openreach holds that allows it to estimate spare capacity in its ducts and on its poles, is not made available to telecoms providers; and
 - *Manual processes:* due to the manual nature of the processes, multiple interactions between telecoms providers and Openreach, and onerous survey information required by Openreach, telecoms providers are subject to lengthy process timescales for planning, surveying and capacity reservation activities.
- 6.28 Based on the problems identified, we said that changes were required to the PIA planning and survey process to ensure PIA is suitable for scale use. These included:
- Network records should be provided to telecoms providers in a digital format that is suitable for importing into telecoms providers' GIS network planning tools. These network records should be sufficiently granular for telecoms providers to plan access networks without undertaking field surveys as a precursor and to be able to calculate PIA charges for their planned network deployments. The records

¹⁵⁸ Visually inspecting BT's infrastructure allows a telecoms provider to verify planning assumptions, especially regarding spare duct capacity since Openreach's records may not always be completely accurate. It is also necessary to capture additional information that is not held in Openreach's records such as the amount of spare capacity in joint boxes, manholes and on poles.

should also include information about the location and attributes of the physical infrastructure, available capacity in relation to the infrastructure and highlight areas where planning activity is in progress to avoid two planners preparing plans to use the same network elements;

- The requirement by Openreach for telecoms providers to undertake field surveys and to submit survey results to Openreach would become unnecessary due to capacity information being available and should be withdrawn. Accordingly, field surveys post planning should be better aligned with Openreach's own operational processes and therefore be limited to verifying the validity of the telecoms provider's plans, gathering information not held in Openreach's records and checking the accuracy of Openreach's records that directly relate to the telecoms provider's network plan; and
- Telecoms providers should be able to submit reservation information in a digital format that can be generated by their network planning tools rather than manually (through manual recording of information in a spreadsheet supplied by Openreach).

Stakeholder responses to the 2016 PIA Consultation

- 6.29 There was a broad agreement among respondents to our 2016 PIA Consultation that we had correctly identified the problems faced by telecoms providers using PIA in terms of planning and surveying. These stakeholders generally supported the direction of our proposals to improve the planning and survey stages for PIA.
- 6.30 Openreach argued that the problems we identified related to the pre-January 2017 PIA product and had been addressed by the product amendments and the PIA Digital Map Tool introduced in January 2017, and further planned enhancements to the tool due in March 2017.
- 6.31 Openreach indicated that it did not object to further PIA developments if they were reasonable, proportionate and where telecoms providers had shown evidence of using the new enhanced systems and processes at scale.
- 6.32 Openreach objected to our suggestion that it should highlight geographic areas in the PIA Digital Map Tool where telecoms providers are undertaking planning activity to avoid duplication of plans using the same network elements. It suggested that releasing such planning information would present a material competition law risk.

Our Proposals

Access to network records

Reference Offer

- 6.33 There is a requirement in the existing PIA Reference Offer to include:
- the location of Physical Infrastructure or the method by which Third Parties may obtain information about the location of Physical Infrastructure.
- 6.34 We have therefore considered in this consultation whether these requirements should continue.

- 6.35 Significant expense is incurred in field engineering works and hence an effective planning and survey process is a critical step in allowing a telecoms provider to undertake its field engineering works in an efficient way, with minimal changes to its planned network deployment once in the field. An effective planning and survey process for PIA is an essential element of the PIA remedy. To deploy access networks at scale, telecoms providers need access to the infrastructure records that Openreach makes available to its own planners in a suitable format so that they can plan networks in an equivalent or comparable manner to BT.
- 6.36 Therefore, we consider that it is necessary to maintain the requirement that the PIA Reference Offer includes:
- the location of Physical Infrastructure or the method by which Third Parties may obtain information about the location of Physical Infrastructure.

Network records database

- 6.37 Following on from the obligation proposed above for BT to provide information on the location of physical infrastructure, we have considered the extent to which we should impose further requirements on BT as to what that information should comprise; and in what format that information should be provided.
- 6.38 We remain of the views we expressed in the 2016 PIA Consultation concerning necessary changes to the format and content of the network records Openreach provides to telecoms providers. These include:
- i) Network records: network records should be provided to telecoms providers in a digital format that is suitable for importing (at sufficient scale) into telecoms providers' GIS network planning tools for the purposes of deploying networks at scale.¹⁵⁹
 - ii) Granularity of information: the network records should be sufficiently granular for telecoms providers to plan access networks without undertaking field surveys as a precursor. They should therefore include location information for ducts, joint boxes, manholes and poles, and associated attribute information such as element identifiers, pole sizes, number of duct bores and joint box / manhole sizes.
 - iii) Capacity Information: capacity calculations that Openreach holds should be made available to telecoms providers in a suitable format. This should take account of capacity that has been reserved but not yet used.
 - iv) Element attribute information for billing: the network records provided by Openreach should contain sufficient detail about element attributes (e.g. joint box size or the number of duct bores on a duct segment) for telecoms providers to calculate PIA charges for their planned network deployments.
- 6.39 We also consider that Openreach's network records should include information relating to significant new infrastructure construction, as soon as it is available to Openreach itself for planning its own network deployment. This could include, for example, duct planned to be deployed to a new housing estate. Telecoms providers

¹⁵⁹ Locations that are sensitive for security reasons (such as airports) would not be included in this requirement.

can therefore request capacity at this pre-build stage allowing Openreach to incorporate these requests prior to actual duct build.^{160 161}

- 6.40 As mentioned above, Openreach has improved access to its network records for telecoms providers using PIA through the introduction of its PIA Digital Map Tool. We consider that these developments by Openreach are important steps in improving the effectiveness of the planning process for telecoms providers using PIA relative to the previous process whereby telecoms providers needed to request and rely on printed maps from Openreach.
- 6.41 However, we also need to ensure that the detailed technical specifications of the PIA Digital Map Tool allow telecoms providers to plan large scale networks effectively. In particular, we consider that, along with system uptime and download speeds, the download limits that apply are likely to be important.
- 6.42 Specifically, the PIA Digital Map Tool should allow for telecoms providers to have access to information at sufficient scale (including the ability to download information, enabling integration with their own GIS planning tools) and in real time. Whilst we understand that download limits may be necessary to keep system loads manageable, we consider that such limitations should not unduly constrain telecoms providers' ability to plan large scale networks. Our view is that telecoms providers should have access to information to allow them to plan in geographic areas of a scale broadly similar to an Optical Local Exchange area.¹⁶² Accordingly, Openreach systems need to be designed and developed with sufficient capacity (and without restrictive capacity constraints either by system design or for other reasons) that allow telecoms providers to download information covering such areas without undue delay.¹⁶³
- 6.43 In light of the above, we consider that it is not sufficient for us solely to impose a requirement in the PIA Reference Offer for BT to provide information on the location of physical infrastructure. Rather, we propose to specify, as part of our proposed network access obligation, that BT must provide access to a database of information on the location of BT's physical infrastructure (PIA Database Access) as a PIA Ancillary Service. While we propose to continue to allow BT to develop the database specification without our direct involvement, this provision will enable us to set out key components of the database and allow us to go on to set further detailed specifications for this database in the event that the database being developed by BT falls short of what we consider is required.

Survey requirements

- 6.44 There is a requirement in the existing PIA Reference Offer to include:

¹⁶⁰ See also the proposal at paragraphs 6.140 to 6.143 below.

¹⁶¹ In our 2016 PIA Consultation, we indicated that telecoms providers should have access to information concerning where other telecoms providers have planning activity in progress. This was suggested to avoid the risk of different telecoms providers progressing plans to use the same network elements. In its response to our consultation, Openreach questioned if this proposal would raise competition concerns, although we note that in its March 2017 Digital Map system upgrade, Openreach included the functionality for telecoms providers to see if there is an existing reservation from another telecoms provider for a section of duct.

¹⁶² An area served by a BT Local Exchange from which optical services are provided.

¹⁶³ Current limits mean that an area comparable to that served by a BT local exchange require multiple downloads of 1km² areas.

- procedures for the provision of information to Third Parties about spare capacity, including arrangements for visual surveys of Physical Infrastructure to determine spare capacity.
- conditions for the inspection of the Physical Infrastructure at which access is available or at which access has been refused on grounds of lack of capacity.

6.45 We have considered whether these requirements continue to be appropriate.

Field surveys

6.46 As mentioned above, Openreach has changed its requirements for field surveys. We consider that these developments by Openreach are important steps in improving the effectiveness of the planning process, relative to the previous process where field surveys were a necessary precursor to planning a network.¹⁶⁴

6.47 Nevertheless, we anticipate that telecoms providers intending to use PIA to deploy large scale networks are likely to find it necessary to undertake in-field surveys as part of their planning process. The choice of whether to undertake a survey, and the extent of that survey, will be based on the telecoms provider's own judgement (including assessing the risks of not undertaking a survey prior to making a PIA reservation).¹⁶⁵

Responsibility for pole surveys

6.48 One specific area where an in-field survey is likely to be particularly important is when a telecoms provider is planning to use BT's poles to connect prospective customers. This is because the records provided in the PIA Digital Map Tool provide the location and size of poles but not all of the other information required to assess the viability of using that pole. In particular, the condition of the pole, including whether it can be climbed; whether the pole has a steel ring (known as a ringhead) which new dropwires must be attached to; and the number and radial distribution of dropwires.

6.49 Our view is that surveying the condition of the pole; identifying whether it is safe to climb; and identifying whether additional apparatus needs to be installed, could be undertaken by a telecoms provider's own accredited engineers. Completion of a survey will allow a telecoms provider to ascertain whether a pole is ready for use (including whether it can accommodate the telecoms provider's equipment on the pole).¹⁶⁶

¹⁶⁴ Under the revised arrangements the need for field surveys is largely confined to activities that would typically be undertaken after network plans have been developed. These include gathering information that is not recorded in Openreach's records and checking the accuracy of Openreach's records that directly relate to the network plan. We also note that telecoms providers now have the option to deploy networks without field surveys and to make minor adjustments during deployment if, for example, Openreach's records are inaccurate.

¹⁶⁵ Later in this section we discuss the information that a telecoms provider needs to provide to Openreach when it requests build works as part of its PIA order.

¹⁶⁶ In a response to a formal information request Openreach has confirmed that currently all adjustments to a pole must be carried out by Openreach, bar the installation of a pole top ringhead. We consider that our proposals set out in Section 4 above on network access mean that in the future, the telecoms provider can request Openreach to make adjustments to the pole at the time of ordering PIA.

- 6.50 More generally, we observe that whether a telecoms provider is able to connect a customer from a pole will depend on whether there is available capacity on the pole for a telecoms provider's dropwires. Currently, Openreach stipulates that where a telecoms provider intends to deploy aerial cables to a pole, a joint-survey of the pole is required by Openreach. Assessing available capacity on a pole is less straightforward than determining the available capacity in a duct, since the former will not only depend on the size of the pole and the number of existing dropwires attached to it but also the radial distribution of those dropwires.¹⁶⁷ Notwithstanding this, for a telecoms provider intending to use PIA at scale it is important that it can connect customers efficiently and with minimal interventions by Openreach. We discuss this later (together with surveying underground lead-ins), in the sub-section on connecting the customer.
- 6.51 For the reasons set out above, we consider that surveys are an important element of deploying a network using PIA and we consider that the procedures relating to these should be clearly set out in the PIA Reference Offer. Therefore, we propose that the PIA Reference Offer continues to include:
- procedures for the provision of information to Third Parties about spare capacity, including arrangements for visual surveys of Physical Infrastructure to determine spare capacity.
 - conditions for the inspection of the Physical Infrastructure at which access is available or at which access has been refused on grounds of lack of capacity.
- 6.52 Our expectation is that information relating to Openreach's infrastructure gathered as part of a telecoms provider's survey is likely to be useful to Openreach and other telecoms providers going forwards. Therefore, we would expect that arrangements are developed so that the information gathered is used to improve the quality of Openreach's network record information (and update its network record information) contained in its database.

Other planning requirements

- 6.53 There is a requirement in the existing PIA Reference Offer to include:
- technical specifications for Physical Infrastructure Access including:
 - technical specifications for permitted cables and associated equipment; and
 - cable installation, attachment and recovery methods;
 - the methodology for calculating availability of spare capacity in Physical Infrastructure.
 - conditions for reserving capacity that shall apply equally to BT and Third Parties.
- 6.54 We consider that these conditions will need to be known by a telecoms provider planning to use PIA to deploy a network since they will have a bearing on the design and deployment of that network.

¹⁶⁷ Currently Openreach retain control of deciding the actual capacity of a pole. Source: Openreach specifications for pole loadings, fittings and overhead cable clearances (CP08 G).

6.55 Therefore, we propose that the PIA Reference Offer continues to include these same requirements.

Ordering PIA

Operational processes

6.56 In the 2016 PIA Consultation, we identified a need to improve the operational processes for capacity reservation to make them suitable for large scale deployments and to better align them with those used by Openreach. We identified a need for changes that would enable telecoms providers to submit reservation requests (including network elements that need augmentation to provide additional capacity) in a digital format that can be generated by their network planning tools, rather than by manually recording information in spreadsheet forms as at present.

6.57 We remain of the view that the improvements identified in the 2016 PIA Consultation are an important enabler for large scale usage of PIA.¹⁶⁸ While the current process may be appropriate for small scale network deployments (where reservation requests are limited to a small number of assets), for large scale networks the ordering process would be too labour intensive for both Openreach and other telecoms providers, impeding the effectiveness of the PIA remedy. For example, we consider that the process for telecoms providers ordering PIA needs to be improved. This is particularly important since Openreach does not reserve PIA itself and is therefore not subject to the same inefficiencies that telecoms providers face relating to the current ordering process. Our view is that telecoms providers should be able to order PIA in a digital format in an efficient manner without heavy reliance on manual processes. We consider that one way this could be achieved would be through telecoms providers being able to order PIA directly from their own GIS planning tools.

6.58 To better understand the potential timescales and costs involved in developing such a system, we sought advice from external consultants Mott MacDonald. Mott MacDonald produced a systems requirements specification that could allow for the processes and flows of information to support the changes to PIA that we outline in this document (including access to network records, ordering and validation of orders). The report provides Mott MacDonald's broad estimates of the timescales and costs of developing such a system and will be published shortly after this consultation.¹⁶⁹

6.59 We note that Openreach has indicated that planned changes to its systems will allow for more automated completion of order forms¹⁷⁰. Given this, we are not currently proposing to impose an obligation on BT prescribing the specific systems that Openreach should develop to support this aspect of the PIA remedy. However, the details around how Openreach's solution will work, the timescales by which this functionality will be offered, and the effectiveness of the solution, are currently

¹⁶⁸ As noted earlier in this section, Openreach plans an update to the PIA Digital Map Tool in May 2017 that will provide functionality to allow telecoms providers to export infrastructure information from the PIA Digital Map Tool to spreadsheet order forms reducing the need to enter information manually. We do not have details of the proposed development of the PIA Digital Map Tool. Consequently, we have not been able to determine the extent it will address the issues we have identified.

¹⁶⁹ DPA Solution System Requirements Specification, Mott MacDonald, April 2017.

¹⁷⁰ Openreach response to 2016 PIA Consultation, page 31.

unclear. Therefore, if BT fails to promptly implement the changes it has put forward, we will consider imposing requirements on BT around this process.

Requests for additional infrastructure capacity

- 6.60 In Section 4, we propose that the PIA network access obligation includes a requirement for Openreach to make adjustments to its infrastructure to relieve congestion, either by repairing faulty infrastructure or providing additional capacity.¹⁷¹ In this sub-section we consider what further obligations should apply to BT in relation to a request by a telecoms provider for additional infrastructure capacity to be provided under PIA.
- 6.61 There is a requirement in the existing PIA Reference Offer for BT to set out:
- arrangements for relieving congested Physical Infrastructure, including the repair of existing faulty infrastructure and the construction of new Physical Infrastructure.
- 6.62 Given our proposals in Section 4 around network access, we consider that it is important there is transparency around the process for requesting additional capacity. We also consider that it is important that it is clear what information a telecoms provider must provide where it is requesting additional capacity. Therefore, we are proposing that the PIA Reference Offer should be required to include:
- arrangements for relieving congested Physical Infrastructure, including the repair of existing faulty infrastructure and the construction of new Physical Infrastructure; and
 - the information that a Third Party is required to provide to BT where that Third Party is requesting the repair of existing faulty infrastructure and/or the construction of new Physical Infrastructure.
- 6.63 In addition, we consider that the PIA Reference Offer should also include a further requirement around the timescales for Openreach to process an order that includes a request to relieve congestion. Specifically, where a telecoms provider has submitted an order for PIA that also includes a request for Openreach to make adjustments to its infrastructure network to relieve congestion, it is important the process needs to allow for Openreach to consider the request and provide a response in a known, and reasonable, timescale.¹⁷² Consequently, we propose that the PIA Reference Offer includes:
- Service Level Commitments and Service Level Guarantees in relation to the timescales for BT to respond to a request by a Third Party to relieve congested Physical Infrastructure other than a congested Pole, where such a response

¹⁷¹ In Section 7, we have proposed that Openreach should recover the costs of network adjustments over all products in markets in which BT has SMP and which use Openreach's physical infrastructure (including PIA).

¹⁷² Such a timescale needs to be sufficient to allow Openreach to make informed decisions about any adjustments that might be needed and the most efficient way to make them. For example, in at least some circumstances Openreach would require field survey information: it may reveal the presence of a redundant cable that could be removed from a duct; or it may be required to determine whether a pole should be replaced since Openreach records may not contain all the information required to assess pole loadings.

confirms that the order has been accepted and includes how BT proposes to relieve that congestion.

- 6.64 Our view is that Openreach and telecoms providers are well placed to take forward the detailed development of these proposals.
- 6.65 Notwithstanding that we expect Openreach to engage with industry to implement the proposed PIA Reference Offer requirements set out above, we draw attention to the following considerations that could act to guide future industry discussions.

Arrangements to provide information to support PIA orders where these include requests for additional capacity

- 6.66 For the reasons outlined above, we welcome the change introduced to PIA in January 2017 that removes the previous onerous survey requirements.
- 6.67 However, where a telecoms provider requests adjustments to infrastructure because of a lack of available capacity (i.e. a request for build works), given our proposed network access obligations (and proposed approach to cost recovery) we consider that it is reasonable for a telecoms provider to provide supporting information to Openreach with its request. This would enable Openreach to assess how to respond to the request.
- 6.68 Our view is that it may be more efficient for telecoms providers to gather the necessary information (as specified by Openreach) during their field survey activities rather than for Openreach to undertake field surveys after receipt of reservation requests. However, we recognise that Openreach may wish to undertake field surveys in some circumstances, for example to satisfy itself that the most cost effective solution is adopted. There may also be other practical considerations, for example Openreach staff would have access to other network records such as cable records that might have a bearing on the solution design and may therefore be in a better position to propose an alternative solution. We therefore consider that these aspects of the process are best progressed by Openreach in discussion with telecoms providers in the first instance.
- 6.69 Our view is that the information provided via Openreach's network records relating to expected available capacity should help guide the level of information that will need to be provided. For example, where Openreach's network records already indicate that there is insufficient capacity to deploy an additional 25mm sub-duct, there should be minimal requirements for the telecoms provider to provide information to support its request for additional capacity (possibly photographic evidence only).¹⁷³ In effect, the telecoms provider would only be required to confirm Openreach's own view of available capacity. However, where Openreach's network records indicate that there is sufficient capacity to deploy a further 25mm sub-duct, the telecoms provider might be required to provide more detailed information to support its request (for example, photographic evidence alongside measurements of existing cables and duct bores).¹⁷⁴ In this case, the telecoms provider would be expected to provide more detailed information since it would need to substantiate disagreements with Openreach's records on available capacity. Our expectation is that information relating to Openreach's infrastructure submitted by the telecoms provider survey is likely to be useful to Openreach and other telecoms providers going forwards. Therefore, we would expect that arrangements are developed so that the information

¹⁷³ In Openreach's PIA digital map system these would be duct sections marked as red.

¹⁷⁴ In Openreach's PIA digital map system these would be duct sections marked as amber or green.

provided is used to improve the quality of Openreach's network record information (and update its network record information) contained in its database (e.g. to correct errors in its network records).

- 6.70 A telecoms provider could order PIA without requesting additional capacity as part of that order. However, if the telecoms provider subsequently encountered a need for additional capacity during its network installation, Openreach would then have grounds for not providing that additional capacity. This is because as part of the PIA process Openreach should have the opportunity to assess build requests and offer alternative solutions to the telecoms provider. Therefore, in the event that the telecoms provider encountered a need for capacity during network installation it would have to restart the ordering process for that particular section of infrastructure, including a survey supported request for additional capacity, allowing Openreach the opportunity to assess the build request.

Information to support orders where these include adjustments to pole infrastructure

- 6.71 We consider that adjustments to poles could be needed in two circumstances:

- i) Where the pole is not ready for use either because it cannot be climbed; does not have a ringhead; or any other reason that prevents a telecoms provider from being able to install its equipment (i.e. connector box) on the pole in anticipation of future connections; and/or
- ii) There are capacity constraints in relation to installing additional dropwires (which we discuss later in this section).

- 6.72 In relation to (i), Openreach's own engineering rules and processes for checking poles should be a key driver of the type of information that a telecoms provider should provide where it requires an adjustment to a pole for reasons of safety and accessibility.

- 6.73 We discuss issues concerning (ii) later in this section.

Service Level Agreements and Service Level Guarantees

- 6.74 It is important that orders from telecoms providers are progressed in reasonable timescales, since delays will have a detrimental impact on network deployment.

- 6.75 We consider that there are two points where SLAs/SLGs need to be established in the ordering and validation process:

- i) Openreach's confirmation that the telecoms provider's order has been accepted (that is, it includes all the necessary information for it to be assessed by Openreach).¹⁷⁵ Our view is that Openreach should complete this step within a matter of days.
- ii) Openreach's response to the order from the telecoms provider.

- 6.76 In relation to providing its response to the order, Openreach will need time to assess the order to ensure that it falls within BT's network access obligation. It will also need to consider how additional capacity, if necessary, could be provided.

¹⁷⁵ This may also include confirmation if the order is in line with previously supplied forecasts.

- 6.77 For example, Openreach could decide to provide additional capacity by building additional infrastructure or releasing capacity through the removal of dead cables (where that is impeding the use of infrastructure). We also consider that Openreach should be able to offer alternative (and reasonable) routes that might be accepted by the telecoms provider.
- 6.78 Therefore, our view is that following the completion of its assessment, Openreach should be able to provide one the following responses to the telecoms provider's order (where this includes a request for additional capacity):
- Approval of the order, including (if needed) information of how additional capacity will be provided;
 - Offer of an alternative route for consideration by the telecoms provider;
 - Rejection of the order and reasons for rejection.
- 6.79 Our view is that the timescales needed for Openreach to assess and provide a response to an order will be dependent on the size and complexity of that request. We note that the current PIA Reference Offer already makes a distinction between single route orders and larger, exchange area orders. We consider that the working day aims outlined in the current PIA Reference Offer where Openreach will approve orders related to a route within five days; and approve orders for an exchange area within 20 days, appear to be broadly reasonable and should be a starting point for industry discussions.

Network deployment

Overview of network deployment processes

- 6.80 For telecoms providers using PIA, the current network deployment stage can broadly be described by the following activities and processes:
- Build works: where Openreach is requested to install new capacity as part of the telecoms provider's PIA order, Openreach will instruct its contractors to fulfil this request.
 - Network deployment: following approval of the PIA order (and completion of any build works), the telecoms provider proceeds with the installation of its access network. From this point in time, Openreach allows the telecoms provider up to six months to deploy its network in the infrastructure that has been reserved.
 - Enabling works: where blocked ducts are encountered during network deployment, the telecoms provider has several choices as it can: request Openreach to carry out the required enabling works to clear the blockage(s); or clear the blockage itself; or seek an alternative route to avoid the blockage.
 - Completion notification: once the telecoms provider has completed its access network deployment, it notifies Openreach and provides details of any deviations from its original plan (as set out in the PIA order) so that Openreach may amend its records.

2016 PIA Consultation

- 6.81 In our 2016 PIA Consultation, we identified several issues with the arrangements set out in Openreach's PIA Reference Offer that could act as an impediment during the network deployment stage for a telecoms provider looking to use PIA on a large scale.
- Build works and enabling works: Openreach undertakes all build works required by telecoms providers. Openreach does not currently offer SLAs for these activities. As a result, Openreach has little incentive to complete build works in reasonable time and telecoms providers face uncertainty and potentially delays which impacts their ability to deploy networks efficiently, raising the costs of the network deployment. Under the business as usual process (at the time of publishing our 2016 PIA Consultation) the same problems were identified for enabling works.
 - Charges for build and enabling works: telecoms providers pay the full upfront cost of any build and enabling works requested. In contrast, build and enabling works costs to support BT's own network deployment are capitalised and recovered across all users of its physical infrastructure via depreciation charges from all products according to their overall average usage. As a result, other telecoms providers using BT's physical infrastructure face higher upfront costs to those faced by BT, putting them at a disadvantage to BT.
- 6.82 Based on the problems identified, we explained that we considered that the PIA network access obligation should include a requirement on Openreach to make adjustments to its infrastructure network to relieve congested physical infrastructure. This could either be by repairing existing faulty infrastructure through enabling works, or constructing new physical infrastructure where there is insufficient capacity through build works. Our view was that Openreach should recover the costs for build and enabling works in the same way whether it makes adjustments to its infrastructure to accommodate BT's network or a competitor's network.
- 6.83 Our initial view was that telecoms providers could be provided with greater certainty around the timescales for build works in two ways:
- through the introduction of SLAs and SLGs in relation to Openreach completing the works; or
 - by adopting a self-provision approach whereby telecoms providers undertake build work themselves.
- 6.84 We also indicated that where a PIA order included a request for Openreach to complete build works, it may be appropriate for Openreach not to commence charging PIA rental for any part of that order until the completion of all build works related to the order. This was because without the build works being completed, the telecoms provider would not be able to deploy its network (and thereby unable to offer services using that network).
- 6.85 We also considered that telecoms providers should have the opportunity to complete enabling works themselves (i.e. through self-provision) noting that enabling works are likely to be identified when a telecoms provider has its civil engineering contractors on site. This would allow the work to be completed at the same time as its network deployment. Our initial view was that the process for completing enabling works could allow for the following choices:

- i) The telecoms provider could complete the enabling works (at its own expense) immediately and without any intervention from Openreach; or
- ii) The telecoms provider could notify and request approval from Openreach for the telecoms provider to undertake the enabling works, with defined SLAs limited to the authorisation process to ensure approval is given in a timely fashion.¹⁷⁶ The telecoms provider would complete the work and charge Openreach for that work based on an agreed price list; or
- iii) The telecoms provider could request that Openreach undertakes the enabling works. These would not be subject to completion SLAs, but Openreach would complete these repairs on the same basis as if it was undertaking repairs for its own purpose.

Stakeholder responses to the 2016 PIA Consultation¹⁷⁷

- 6.86 Openreach argued that the concerns identified needed to be set in the context of the new PIA processes launched in January 2017. Under these changes PIA telecoms providers can conduct their own enabling works.
- 6.87 Several stakeholders¹⁷⁸ stressed the importance of having SLAs in relation to build and enabling works since without these there is uncertainty around the timescales for deploying their networks. Openreach highlighted the challenges involved in setting meaningful SLAs/SLGs given many of the timing variables are not in Openreach's control and will be specific to the individual job.¹⁷⁹
- 6.88 Several stakeholders¹⁸⁰ advocated a mixed model approach where Openreach has a requirement to make adjustments to the infrastructure but where telecoms providers also have the opportunity to progress work on behalf of Openreach. In contrast, Openreach raised concerns over a mixed approach due to the management requirements, additional costs and the risk of moral hazard where the more complex and resource intensive jobs are passed to Openreach to complete.
- 6.89 Openreach considered that if telecoms providers wanted increased control and certainty over timescales for build works then a self-provision model is more appropriate. However, it also considered that further thought would be needed on the process developments to address operational and practical challenges including meeting quality standards and alignment with Openreach's own planned infrastructure upgrades.
- 6.90 Some stakeholders were supportive of deferring PIA rental charges until the assets were ready for use, while others noted this presented a gaming opportunity to the access seeker and suggested various ways of bounding such a proposal to discourage this behaviour. For example, Hyperoptic suggested that deferred PIA rental charges should be limited to orders relating to an exchange area, while Openreach argued that limiting the deferral of PIA rental charges to orders relating to an 'Optical Local Exchange' area was not granular enough and instead suggested

¹⁷⁶ Since Openreach would only be required to authorise work rather than carry out the work itself, we envisaged these SLAs would be limited to a matter of days, or less.

¹⁷⁷ Issues relating to the network access obligation and cost recovery are discussed in Section 4 and Section 7 respectively.

¹⁷⁸ See responses to the 2016 PIA Consultation from the PAG, Virgin Media, Vodafone and Hyperoptic.

¹⁷⁹ For example, local authority permissions for street works.

¹⁸⁰ See responses to the 2016 PIA Consultation from Virgin Media, Vodafone and the PAG.

cabinet areas (currently the basis for FTTC deployments) or fibre spine and splitters (the basis for FTTP deployment).

Our Proposals

6.91 We consider that for PIA to be used at scale it is essential that telecoms providers have greater certainty about the timescales for network deployment when using BT's duct and pole infrastructure so that they are able to install their networks in a timely manner, without undue delays. This includes providing confidence regarding the time to undertake and complete build and enabling works.

Build works

6.92 In Section 4, we set out our proposals relating to Openreach's network access obligation for PIA. As part of those proposals, Openreach is required to make adjustments to its network where this is necessary for its physical infrastructure network to be available to telecoms providers for the purpose of deploying their own networks.

6.93 In cases where an order includes a requirement to build additional capacity, a telecoms provider will not be able to fully deploy its network (and generally be unable to offer services) until the additional capacity is provided and the infrastructure is 'ready for use'. This has the following implications:

- For duct infrastructure, we would expect that this will mean that Openreach is required to complete any build works that are imposed under the network access obligation prior to charging rental for any part of an order.¹⁸¹
- For pole infrastructure we would expect that this will mean that Openreach, where it is required under the access obligation, will need to:
 - Ensure that a pole is safe and can be climbed by a telecoms provider. Where a pole does not meet this requirement, it should be replaced or repaired.^{182 183}
 - Install a 'steel ringhead' on a pole which does not have one.
 - Ensure that a pole has space for a telecoms provider's connection box or other apparatus, to be installed.

6.94 Our view is that greater timeliness and certainty of timescales for the delivery of such build works are needed for our proposed PIA requirement to be effective. Our view is that this certainty could be provided in two broad ways:

- Through Openreach having the right incentives to deliver build works in reasonable and certain timescales.

¹⁸¹ Notwithstanding that a telecoms provider could agree commercial terms (in reasonable timescales) to complete build works on behalf of Openreach where they are in effect acting as a sub-contractor to Openreach.

¹⁸² This requirement would exclude poles which cannot be climbed due to adjacent hazards. In response to our s135 information request dated 6 March 2017, Openreach provided a rough estimate that just over 4,000 poles (out of 3.6 million) cannot be climbed due to adjacent hazards.

¹⁸³ In response to our s135 information request dated 6 March 2017, Openreach stated that approximately 4.6% of all poles are decayed, damaged or leaning such that they are unclimbable.

- By offering telecoms providers the opportunity to undertake the build works themselves and thereby allowing the telecoms provider to determine the timescales for delivery of that work.

6.95 We consider that our main focus should be to set the right incentives for Openreach to deliver build works as part of its network access obligation in a timely fashion. We consider that there are a number of benefits to Openreach completing planned build works on its own infrastructure. These include:

- Openreach has sight of all planned build requirements relating to its infrastructure, both from telecoms providers under PIA and its own requirements. It is therefore able to coordinate the completion of all build works on its infrastructure which has potential efficiency benefits (in terms of lowering the costs of total build works).
- Openreach is more likely than other telecoms providers to have existing wayleave agreements in place and is therefore less likely to face delays in completing build works in cases where wayleaves need to be agreed.¹⁸⁴
- Certain adjustments to Openreach's infrastructure can only be performed by Openreach. These currently include the installation of footway boxes and where an existing pole needs to be replaced. Therefore, even if another telecoms provider wants to make use of a self-provision model for other build works, for some elements it must still rely on Openreach to carry out the work. In these circumstances, the practical difficulties of coordinating engineering works between another telecoms provider and Openreach are likely to reduce the advantages of a self-provision model significantly.
- Adjustments to BT's pole infrastructure are likely to result in works relating to Openreach's active equipment, and the services provided via that equipment. Currently only Openreach is able to perform this work, and we would expect Openreach to continue to want a significant role in this process to safeguard the integrity of its own active equipment.

6.96 We therefore propose to incentivise Openreach to complete build works in reasonable timescales and with more certainty for telecoms providers in two ways:

- Through a pricing mechanism and, in particular, the point from when Openreach is able to commence rental charges.
- Through the introduction of SLAs and SLGs.

6.97 We expand on each of these below.

Commencement of rental charges for PIA

6.98 We consider that where a telecoms provider places an order for PIA that includes a requirement to build additional capacity, it will not generally be able to fully deploy its network (and therefore offer services over that network) until the additional capacity is provided.

¹⁸⁴ We note that wayleaves may still be required for other telecoms providers to install their sub-ducts within BT's ducts.

6.99 Therefore, where Openreach is responsible for completing build works, our view is that Openreach should only be able to commence charging rental for PIA relating to any part of a single PIA order when all build works is completed for that order, including making poles ready for use (i.e. the telecoms provider incurs rental charges for the infrastructure from when that infrastructure is 'ready for use' to deploy its network).¹⁸⁵

6.100 We consider that this will provide the following benefits:

- Telecoms providers will incur rental charges at the point that they are able to deploy their networks (and therefore potentially be in a position to earn revenues from offering services to their customers with that network); and
- It will provide an incentive for Openreach to complete build works in a more timely manner (since Openreach will forego PIA rental revenues until the build works are complete).

6.101 We recognise that a limit will need to be set in relation to the size of an order (and therefore the scope of Openreach's obligation). Absent such a limit, a telecoms provider could place a single PIA order (including a request for build works) over a significant geographic area comprising a number of regions. As such, any uncompleted build works in one particular region may have little bearing on its ability to deploy a network in other regions where it can start offering services but without incurring any PIA rental charges. In contrast, where a limit is set too tightly, a telecoms provider will be impeded from deploying its network using PIA and the incentives on Openreach to complete build works (through lost PIA rental revenues) will be weaker.

6.102 We consider that the limits set by the proposal need to allow a telecoms provider to plan and deploy a network at scale. Our view is that telecoms providers are likely to plan their deployments in areas broadly corresponding to the size of an Optical Local Exchange area. We therefore propose that the requirement is bounded by an area served by an Optical Local Exchange for the following reasons:

- We consider that an Optical Local Exchange area provides a reasonable approximation of an area that a telecoms provider is likely to plan and deploy a large scale network.
- We consider that it is of sufficient scale to provide an incentive for Openreach to complete build works in reasonable timescales.
- An Optical Local Exchange area is consistent with our proposals around the geographic usage for PIA.

6.103 We intend to discuss aspects of pricing for PIA in a further consultation in the summer. As part of that consultation we will set out our detailed proposals in relation to PIA rental charges including the commencement of those rental charges.

¹⁸⁵ In the event that a telecoms provider makes arrangements with Openreach to undertake build works themselves (i.e. self-provision) then alternative arrangements would need to be agreed for the commencement of rental charges.

SLAs and SLGs for build works

- 6.104 Currently the PIA Reference Offer does not include specific conditions relating to SLAs and SLGs for the time to complete planned build works. Our view is that these are needed to provide the incentives for Openreach to complete build works in a timely manner and with greater certainty for telecoms providers.¹⁸⁶
- 6.105 We propose to require that the PIA Reference Offer includes a requirement on Openreach to establish SLAs and SLGs relating to the completion of planned build works following a PIA order.
- 6.106 We recognise that determining detailed SLAs for the completion of build works has challenges. Build works relating to PIA are unlikely to be of a standard type: a single 'build' request will not exist and the requests by telecoms providers will depend on the local characteristics of the specific BT infrastructure and the telecoms provider's own network deployment plans. In addition, Openreach does not have full control of all the factors that determine the time for completing works. For example, in some cases Openreach will need to seek and receive approval from authorities to dig up roads or divert traffic so that the work can be completed.
- 6.107 Notwithstanding this, we observe that similar issues are likely to arise in relation to the provision of duct for Openreach's active products where SLAs and SLGs are established.
- 6.108 Our view is that Openreach and telecoms providers are well placed to take forward the more detailed development of an appropriate SLA and SLG regime in relation to build works for PIA. While we are not setting out the details of an SLA and SLG regime, our view is that the expected timescales for completing build works under PIA should be in line with the completion of build works where these are required by Openreach itself, for the purposes of deploying its own fibre broadband services. This approach would be in line with our proposed requirement for non-discrimination.
- 6.109 Furthermore, Openreach is required to treat any information provided to it in confidence, not passing it to any other part of Openreach where it could provide a competitive advantage. We would therefore expect to see build works required by PIA users to be suitably anonymised and treated by Openreach as part of its internal workflow processes for other duct and pole build works.
- 6.110 In light of the above, we propose that the PIA Reference Offer includes:
- Service Level Commitments and Service Level Guarantees in relation to the timescales for completion by BT of any works necessary to relieve congested Physical Infrastructure other than a congested Pole.

Self-provision relating to build works

- 6.111 Allowing telecoms providers the opportunity to complete build works themselves (following approval by Openreach as part of an ordering and validation process) could give them greater control and certainty around the timescales for completion. In response to our 2016 PIA Consultation, a number of stakeholders (including

¹⁸⁶ We consider that even where Openreach is only able to commence charging rental for any part of an order when all build works are completed for that order, there is a risk that the potential benefits to Openreach of delaying competitive entry (from not completing build works) may outweigh the lost PIA rental revenues associated with completing build works promptly.

Openreach) provided support for the notion of a self-provision model. There is currently no requirement for BT to set out in the PIA Reference Offer the arrangements for telecoms providers to undertake their own build works. However, we consider that it is important for such a process to exist. Therefore, we propose that the PIA Reference Offer includes:

- conditions on which Third Parties may elect to undertake build works on behalf of BT.

6.112 Our view is that Openreach and telecoms providers are well placed to take forward the detailed development of this proposal.

6.113 We recognise that under a self-provision model, Openreach would need to retain control over various elements of that build work including:¹⁸⁷

- Design aspects: Openreach should be able to ensure that any build works are in accordance with its engineering design rules.
- Quality: Openreach should be able to ensure that build works are completed to an adequate standard.
- Costs: to the extent that Openreach bears the costs of build works, it should be able to control them. In particular, if works are undertaken by other telecoms providers, Openreach should not face higher costs than if it did the work itself.

6.114 We acknowledge that implementing a self-provision model for build works would require a set of practical issues to be resolved.¹⁸⁸ Our understanding is that Openreach sub-contracts most build works to civil engineering contractors and so a self-provision model could be based on these current arrangements, with Openreach allowing telecoms providers to undertake build works on similar terms (including prices) to the terms Openreach puts in place with its own civil engineering contractors.

Installation

6.115 There is a requirement in the existing PIA Reference Offer to include:

- conditions for the installation and recovery of cables and associated equipment.

6.116 We consider that telecoms providers will need to know this to use PIA in the future. Therefore, we propose that the PIA Reference Offer continue to include this same requirement.

Enabling works

6.117 A telecoms provider installing its network using BT's infrastructure may encounter obstacles, such as collapsed or blocked ducts, which could not be determined in

¹⁸⁷ These issues are also pertinent to self-provision for enabling works discussed later in this section.

¹⁸⁸ For example, in its response to our 2016 PIA Consultation, Openreach highlighted that arrangements would need to be put in place to allow telecoms providers access to Openreach stores to use specific or exclusively supplied materials (e.g. joint box lids), where necessary to meet required standards.

advance from a visual survey. In these instances, enabling works on the duct will be required to allow the telecoms provider to progress its network deployment.

6.118 For a telecoms provider intending to use PIA for large scale network deployment, the requirements and characteristics relating to enabling works are likely to differ to build works in the following ways:

- the need for enabling works is only likely to be identified during the installation of the network (as opposed to during the planning and survey stage for build works). Therefore, unlike requests for additional capacity which are likely to be planned in advance and made when ordering PIA, enabling works cannot be planned for at the ordering stage.
- Enabling works are likely to be of a smaller scale and less complex than build works.¹⁸⁹

6.119 In Section 4, we propose that as part of BT's network access obligation, Openreach is required to make adjustments to its network where this is necessary for its physical infrastructure network to be available to telecoms providers for the purpose of deploying their own networks. Accordingly, we consider that telecoms providers should be able to request that Openreach undertakes enabling works (if required) and the process for PIA needs to accommodate this option.¹⁹⁰

6.120 In January 2017 Openreach introduced changes to PIA that allowed telecoms providers the opportunity to undertake their own enabling works.¹⁹¹ Prior to this change, telecoms providers would need to rely on Openreach to intervene in their network deployment process and clear blockages on their behalf.

6.121 We welcome the change introduced by Openreach since the telecoms provider will have civil engineering contractors on site and may be able to complete the enabling works at the same time as deploying their network and make better utilisation of its committed workforce. This represents a more efficient process than having to stop work and seek Openreach's intervention.

6.122 However, we recognise that where enabling works impact Openreach's own cost base, Openreach will need to have a role in the process to assess, authorise and control the incidence of those works.¹⁹² Therefore, the PIA process will need to incorporate our proposed network access obligation (and other proposals) effectively.

6.123 We consider that where a telecoms provider identifies the need for enabling works which fall within the scope of the PIA network access obligation, it should have the following options:

¹⁸⁹ For example, desilting of a duct or repairing a section of collapsed duct.

¹⁹⁰ In Section 7 we propose that Openreach should recover the costs relating to network adjustments (including enabling works) over all products in markets in which BT has SMP and which use Openreach's physical infrastructure (including PIA).

¹⁹¹ Under the process change telecoms providers are also able to request Openreach to undertake enabling work on their behalf. The telecoms provider is charged a fee by Openreach for the works.

¹⁹² We consider that the process should also allow for the telecoms provider to notify Openreach that the enabling works is complete so that Openreach's own records can be updated (and post-completion audits of the enabling work can be undertaken to the extent that these are required by Openreach).

- i) Option 1: Undertake the enabling works itself at its own expense and risk (self-provision at own risk); or
- ii) Option 2: Undertake the enabling works itself but seek to recharge Openreach for the costs (self-provision and recharge); or
- iii) Option 3: Request Openreach to intervene and undertake the enabling works (Openreach enabling works).

6.124 For each of the above options, we consider that the following elements are likely to be of importance to allow for an efficient process.

Figure 6.2: Enabling works - Important elements of an efficient process

	Timescales for Openreach to approve works	Clarity relating to how Openreach decides on course of action	Certainty around timescales for Openreach to complete works	Engineering rules relating to completing works
Option 1: Self-provision at own risk	N/A	N/A	N/A	✓
Option 2: Self-provision and recharge	✓	✓	N/A	✓
Option 3: Openreach enabling works	✓	✓	✓	N/A

Requirement to publish engineering rules

6.125 A telecoms provider that decides to undertake enabling works itself will need to ensure that it follows Openreach’s engineering rules and meets Openreach’s quality standards.

6.126 Therefore, we consider that the PIA Reference Offer should include:

- technical specifications for PIA, including:
 - technical specifications relevant to the repair of existing faulty Physical Infrastructure.

6.127 Again, our view is that Openreach is best placed to develop the detailed provisions with industry.

Process for Openreach to assess and authorise requests for enabling works

- 6.128 Where a telecoms provider identifies the need for enabling works and would like to complete that work itself and recharge Openreach for it, the process needs to allow Openreach to assess and approve the works (since the completion of the work will impact its cost base).¹⁹³
- 6.129 Where Openreach uses civil engineering contractors to deploy its own network, the contractor is required to seek authorisation from Openreach to complete any enabling works, where this would result in additional costs. Any unauthorised works are carried out at the contractor's own risk and cost. In deciding whether an adjustment required by a contractor is acceptable and can proceed, Openreach has indicated that since local factors make each scenario unique, it is not viable for its planner (who authorises any enabling works) to adhere to a fixed set of instructions. Instead, the planner will decide on the course of action, ensuring the overall spend on civils work remains within budget, based on their local knowledge of the planned deployment and own assessment of the problem and set of viable alternatives.
- 6.130 Our view is that for telecoms providers using PIA, the authorisation process for enabling works should be equivalent to that followed by Openreach in similar circumstances when it is deploying its own network unless Openreach can justify the differences. This is consistent with the non-discrimination obligations we set out in Section 5.
- 6.131 Therefore, to the extent that BT cannot justify differences between its processes and those applied to other telecoms providers, Openreach must either: provide a set of rules and processes for enabling works which applies both to its own network deployment and to requests under PIA; or adjust its internal processes to match the approvals process for enabling work placed on other telecoms providers.
- 6.132 We also consider that telecoms providers should have certainty around the timescales for receiving authorisation from Openreach to proceed with enabling works. Given a telecoms provider deploying a network will have contractors in-field our view is that it is important that these contractors can be used efficiently. We consider that Openreach should establish SLAs and SLGs relating to the timescales for assessing and authorising requests by telecoms providers to complete enabling works as part of the PIA Reference Offer. Therefore, we propose that the PIA Reference Offer includes:
- Service Level Commitments and Service Level Guarantees in relation to the timescales for BT to respond to a request by a Third Party to undertake works itself to relieve congested Physical Infrastructure.
- 6.133 Our view is that Openreach and telecoms providers are well placed to take forward the more detailed development of an appropriate SLA and SLG regime.

Certainty around timescales for Openreach to complete works

- 6.134 We believe that a telecoms provider intending to use PIA on a large scale is likely to have a strong incentive to undertake their own enabling works. This is because it is

¹⁹³ Indeed, where a telecoms provider requests Openreach to complete the works this will also impact Openreach's cost base.

likely to have its own workforce in-field (during their network instalment) that is capable of completing enabling works without Openreach's involvement.

- 6.135 However, where a telecoms provider does require Openreach to undertake enabling works, we consider that the telecoms provider needs to have a degree of certainty about how long the work will take to complete. Therefore, we consider that Openreach should establish SLAs and SLGs relating to the timescales for completing enabling works. We consider that this is already covered by the proposed SLAs and SLGs outlined in paragraphs 6.104 to 6.110 above in relation to requests for relieving congested infrastructure.
- 6.136 As explained above, our view is that Openreach and telecoms providers are well placed to take forwards the more detailed development of an appropriate SLA and SLG regime. Consistent with the non-discrimination obligation we propose, unless differences can be justified, we would expect the timescales for completing such work to be equivalent to comparable work in relation to Openreach's own fibre deployment.

Risks of a self-provision and Openreach provisioned approach to enabling works

- 6.137 In response to our 2016 PIA Consultation, Openreach argued that allowing a mixed approach where telecoms providers could choose either to undertake their own enabling works or request Openreach to complete the works could result in moral hazard where the more complex, resource intensive and costly jobs are passed to Openreach to complete.
- 6.138 For the reasons outlined earlier in this section, our view is that a telecoms provider intending to use PIA to deploy a large-scale network is likely to have a strong incentive to undertake enabling works itself so that it can install its network without any delay. Under our proposals, where a telecoms provider intends to recharge Openreach for undertaking enabling works itself it will need to follow a process whereby it requests authorisation from Openreach to undertake the work. Our view is that this will in itself mitigate the financial impact resulting from a moral hazard risk that Openreach raises since it will lengthen the timescales for completing the enabling works by the telecoms provider (compared to the case where the telecoms provider completes the work without seeking to recharge Openreach).
- 6.139 Nevertheless, where a telecoms provider has the opportunity to undertake enabling works (and recharge Openreach for this work) or request that Openreach undertakes the work (and recovers the cost across all users of its infrastructure) a moral hazard risk could exist. However, our view is that the risk will be limited since Openreach's current price list reflects the different costs of works to some extent, such that more difficult works are charged at a higher rate.¹⁹⁴ Therefore, the incentives for a telecoms provider to exploit opportunities to carry out less complex works and pass on the more complex works to Openreach will be limited by the structure of Openreach's prices. To the extent that the impact of a moral hazard risk materialises, Openreach would be able to make its price list more granular to mitigate this impact.

Plans for new physical infrastructure capacity

- 6.140 There is an existing requirement that the PIA Reference Offer includes:

¹⁹⁴ For example, the price of installing duct per metre is different for soft ground, footways and carriageways.

- a procedure for BT to announce plans reasonably in advance for new construction of Physical Infrastructure such that Third Parties may request BT to install additional capacity for those Third Parties.
- 6.141 This requirement was imposed as an alternative to requiring BT to install additional capacity to accommodate potential future demand from telecoms providers. Our view was that it was likely to be more efficient for either BT or telecoms providers to install additional duct capacity in response to firm requirements. This requirement therefore, required BT to announce its infrastructure construction projects to telecoms providers so that it could install additional capacity when in receipt of firm orders. We consider that the reason for imposing this requirement remains current.
- 6.142 We are also of the view that there is likely to be scope for co-investment opportunities between Openreach and other telecoms providers relating to the construction of new physical infrastructure.
- 6.143 For these reasons, we therefore, consider that it is appropriate to impose a requirement that the PIA Reference Offer for BT to specify a procedure for it to announce its plans (reasonably in advance) regarding the construction of infrastructure. Therefore, we propose that the PIA Reference Offer continues to include the following requirement:
- a procedure for BT to announce plans reasonably in advance for new construction of Physical Infrastructure such that Third Parties may request BT to install additional capacity for those Third Parties.

Connecting the customer

Overview of the connecting the customer stage

- 6.144 The final connection between a customer's premises and the access network deployed by the telecoms provider is known as the 'lead-in'.
- 6.145 Around 50% of UK premises have overhead lead-ins in the form of dropwires attached to the premises from poles, while the other 50% have underground lead-ins, either through ducts or as directly buried cable. A geographic area is likely to have a mix of both underground lead-ins and overhead lead-ins. Therefore, for a telecoms provider aiming to deploy a broadband access network at scale using PIA, it is important that the remedy is effective for both overhead and underground lead-ins.
- 6.146 This part of the network has unique characteristics as infrastructure is, in general, associated solely with single premises. Moreover, the existing lead-in infrastructure is often designed and configured for the provision of minimal cable installations, which presents potential capacity constraints for a telecoms provider intending to deploy its network using that infrastructure and could therefore hinder competitive network deployment.
- 6.147 Under the current PIA process:
- Underground lead-ins (to the extent that lead-in duct exists) can be reserved by a telecoms provider prior to it deploying its network or in response to an end customer order.
 - For overhead lead-ins, telecoms providers can request access to locate their own equipment at the top of an existing Openreach pole to which the telecoms

provider attaches their own dropwire to the customer premises (in compliance with specified engineering rules and health and safety standards).

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Overhead lead-ins

- 6.148 We explained that the capacity of a distribution pole is set by Openreach and is determined primarily by the size of the pole and the number and radial distribution of dropwires that are attached to the pole. Furthermore, our understanding from telecoms providers who have conducted field surveys for PIA, indicated that a significant proportion of BT's poles, in the urban and suburban areas surveyed, have insufficient capacity to support a second telecoms provider's dropwires to all the premises they might seek to connect.
- 6.149 We outlined that in the event a pole had reached its capacity a telecoms provider can require Openreach to remedy the situation under the existing PIA terms by:
- installing a larger/stronger pole;
 - strengthening the existing pole, for example by adding a stay;
 - installing an additional pole in close proximity to the existing pole; or
 - providing ducts for underground lead-ins.
- 6.150 We considered that our initial proposals for how costs should be recovered by Openreach for build works would mitigate the cost disadvantage faced by telecoms providers relative to BT, when using BT's poles.
- 6.151 However, we also identified a set of issues relating to carrying out work on poles that might present a barrier to the effective use of poles for overhead lead-ins. In particular, where additional capacity was required on a pole:
- The work to provide additional capacity can take considerable time to complete and if a wayleave is required, for example to install a larger pole on private land, this time period could be uncertain.
 - Some solutions could be disruptive not only to the customer requesting service, but to all others attached to the pole. For example, replacing an existing pole will require all of the existing dropwires to be disconnected in order to transfer them to the new pole.
 - Some solutions, such as the provision of additional poles, may be unpopular with local residents.
- 6.152 In view of these issues, we considered whether a 'dropwire upgrade' approach could provide an alternative solution. With this approach, Openreach would replace the existing copper dropwire with a hybrid fibre/copper dropwire to facilitate the telecoms provider's fibre connection whilst maintaining BT's copper connection. We acknowledged that this approach would require us to impose a new form of network access and that a range of technical and process issues would need to be addressed. We therefore asked stakeholders for their views about whether such an approach could provide a viable solution.

Underground lead-ins

- 6.153 We considered that underground lead-ins should be distinguished from overhead lead-ins because of their different characteristics and the different constraints that apply.
- 6.154 We explained that a telecoms provider intending to connect a customer via an underground lead-in using BT's ducts could encounter one of the following scenarios:
- duct available with sufficient capacity to deploy an additional cable to connect the customer; or
 - duct available but without sufficient capacity to deploy additional cable to connect the customer or where there is no duct available and lead-ins are directly buried.
- 6.155 Our initial view was that:
- where duct is available and has sufficient capacity to deploy additional or new fibre, Openreach should offer access to this infrastructure. In addition, where a telecoms provider discovered that the duct was blocked or collapsed, the process for completing the respective enabling works (and approach to cost recovery) should follow the approach for enabling works in other parts of the duct infrastructure.
 - where there is no duct available, or the duct is too small to accommodate an additional cable, the telecoms provider should deploy the infrastructure for its lead-in at its own cost and risk.

Stakeholder responses to the 2016 PIA Consultation

- 6.156 Openreach argued that our dropwire upgrade approach did not represent access to existing Openreach duct or pole infrastructure but rather formed part of the construction of a new FTTP network. As such, we would be imposing a new access condition which we had failed to evidence.
- 6.157 Openreach identified operational challenges that would need to be addressed with the dropwire upgrade approach. Other stakeholders highlighted that different telecoms providers may require different technical solutions. Vodafone argued that Ofcom should not prescribe a single solution for overhead lead-ins but enable a range of options.
- 6.158 Several stakeholders indicated that a dropwire upgrade approach using a hybrid copper/micro tube may be a better technical solution compared to the hybrid copper/fibre approach we suggested. For example, the PAG did not agree with our proposed approach to underground lead-ins and suggested that the same options as proposed for overhead lead-ins should apply for duct lead-ins (i.e. where Openreach supply the lead-in and recover the cost over the longer-term).

Our Proposals

- 6.159 In Section 4, we set out our proposals relating to BT's network access obligations including a requirement to make adjustments to its network where this is necessary for its physical infrastructure network to be available to telecoms providers for the purpose of deploying their own networks. In that section, we discuss a set of factors

relevant to this requirement and use a set of examples to illustrate the situations where we would expect the obligation applies, and situations where it does not.

- 6.160 In this sub-section, we set out our proposals relating to ensuring an effective PIA process for connecting a customer, in light of our proposals in Section 4.
- 6.161 Currently, the PIA Reference Offer does not impose any requirements on BT to include in that Reference Offer provisions relating to connecting the customer, either via overhead lead-ins or underground lead-ins.

Overhead lead-ins

- 6.162 Our objective is to establish an effective remedy for telecoms providers intending to use Openreach's pole infrastructure to connect a customer.
- 6.163 By way of background, at this stage of the proposed PIA process, Openreach will have ensured that the pole is 'ready for use' and the telecoms provider may have installed its equipment on the pole in preparation for connecting future customers.¹⁹⁵ Our view is that it is imperative for a telecoms provider to be able to provide a connection to a customer (as a result of winning a customer) in reasonable timescales and with certainty around those timescales.
- 6.164 We recognise that where our proposed access obligation places a requirement on BT to address a distribution pole capacity constraint that prevents a telecoms provider from connecting a customer via an overhead lead-in, Openreach could comply with this obligation by providing additional capacity in a number of ways.¹⁹⁶ For example, it could choose to provide capacity by:
- removing existing unused copper dropwires to free-up space;
 - replacing existing poles that are at (or near to) the end of their life with larger/stronger poles to allow for more capacity; or
 - replacing an existing copper dropwire with a hybrid copper/microtube drop cable which the telecoms provider could use for its own fibre.
- 6.165 As noted above, in our 2016 PIA Consultation we invited views on mandating a particular solution for capacity constrained distribution poles: requiring Openreach to upgrade existing copper dropwires with hybrid fibre/copper dropwires.¹⁹⁷ We remain of the view that there are a number of attractions of this approach (and similar approaches such as hybrid copper/microtube dropwires).¹⁹⁸
- 6.166 However, our view is that the most appropriate approach to providing capacity on a pole is likely to depend on the specific details relating to that connection. Deciding how a connection should be provided from a pole will be dependent on the available

¹⁹⁵ We note a telecoms provider may prefer to install its equipment at the time the first customer is connected.

¹⁹⁶ Where a pole is not capacity constrained a telecoms provider would be able to self-provide its own drop wire from a pole.

¹⁹⁷ We also invited views on whether this should apply to all overhead lead-ins or only where a pole is capacity constrained.

¹⁹⁸ These included unlocking capacity on existing poles at lower cost, reducing the need for multiple engineer visits and work on the pole, maintaining continuity of service prior to connecting the fibre, facilitating easier customer switching in the future, and ensuring greater equivalence between BT and other telecoms providers in the use of BT's poles.

capacity of that pole. That capacity will in turn depend on: the size of the pole; the number of existing dropwires attached to that pole; and also the radial distribution of those dropwires, since all these factors determine the load bearing capacity of the pole, based on a set of engineering rules.

- 6.167 Accordingly, the appropriate approach to providing a connection from a particular pole could be different in different circumstances, due to the location of the premises to be connected to that pole. Therefore, our view is that a 'one size fits all' approach is likely to be too restrictive.
- 6.168 As explained in Section 4, we consider that where our PIA network access obligation requires Openreach to remedy congested infrastructure, it should be able to choose how to do so. This provides Openreach with the flexibility to choose the most efficient solution possible, and allows it to take account of its own future requirements.
- 6.169 Our ultimate aim is for telecoms providers to be able to connect customers effectively and efficiently using overhead lead-ins from poles. Therefore, subject to Openreach having the appropriate incentives to deliver capacity for other telecoms providers' overhead lead-ins effectively, we consider that Openreach should have the flexibility to choose the solution for providing that capacity, informing the telecoms provider of its proposed approach with the proviso that the methods for providing capacity are interoperable.^{199 200}
- 6.170 To assess how to deliver capacity from a pole, Openreach will need to have the relevant information to assess the situation based on its engineering rules. Depending on the approach chosen having gathered this information, Openreach would then undertake any necessary works to allow for that connection (e.g. provisioning a dropwire upgrade). Our view is that Openreach and telecoms providers are well placed to take forwards the more detailed development of a process for gathering this information.
- 6.171 While we are not proposing a specific process, we consider that the information could be gathered, held and updated in two main ways:
- i) Option 1: Openreach could undertake a pole survey to determine how capacity should be provided each and every time that a telecoms provider proposes to connect a customer from a pole.
 - ii) Option 2: Openreach could publish the necessary engineering rules and relevant information to allow the telecoms provider to both record the relevant information using its own accredited surveyors and assess how capacity should best be provided in a specific circumstance. The information gathered could be held in a database, updated as further customers are connected, and accessed by Openreach and other telecoms providers to avoid future on-site surveys where possible.

¹⁹⁹ In addition, we now understand that most distribution poles have considerable spare capacity. Therefore, unless the approach was required for all poles (i.e. not just those identified as being capacity constrained), the benefits of mandating a dropwire upgrade solution (or any other single solution) might be limited.

²⁰⁰ Our understanding is that unlike a hybrid fibre/copper dropwire solution, a hybrid copper/microtube dropwire solution would be interoperable with an additional fibre-only dropwire solution (appropriate where there is existing pole capacity available) as they can share connectors at the top of the pole, or at the distribution point.

6.172 Our view is that whilst Option 1 is feasible, a process that requires Openreach to visit a site (i.e. the location of a pole) to determine how capacity from a pole should be provided to a premise each and every time a telecoms provider needs to connect a customer would be impractical and inefficient in the context of PIA being used on a large scale.²⁰¹ Therefore, as PIA volumes increase, a more efficient process will need to be established. Our view is that the development of a database that holds information relating to the available capacity on a pole, and how additional capacity to individual premises would need to be provided, could be the basis for a more efficient solution.

6.173 We consider that once a telecoms provider has gained a customer, it is imperative that it is able to provide the final connection promptly, and to a known timescale, if the telecoms provider is to avoid significant risk of losing an acquired customer.

6.174 In light of the above, we propose that the PIA Reference Offer includes:

- Service Level Commitments and Service Level Guarantees in relation to the timescales for BT to respond to a request by a Third Party to relieve a congested Pole where such a response confirms that the order has been accepted and how BT proposes to relieve that congestion;²⁰² and;
- Service Level Commitments and Service Level Guarantees in relation to the timescales for completion by BT of any works necessary to relieve a congested Pole.

6.175 We would expect Openreach to engage with industry before putting in place SLAs and SLGs pursuant to this obligation.

6.176 While we are leaving the specification of our proposed SLAs and SLGs to BT, our expectation is that the SLAs and SLGs put in place will reflect retail customer expectations that when they have contracted with a new telecoms provider, their new service will be provided promptly. If BT fails to put in place sufficiently robust SLAs and SLGs pursuant to this requirement that reflect this, we will not hesitate to use our powers of direction to impose a regulatory requirement on Openreach to provide access within a specified number of days.

Underground lead-ins

6.177 We consider that a telecoms provider intending to connect a customer via an underground lead-in using Openreach's ducts could face one of the following scenarios:

- duct available with sufficient capacity to deploy an additional cable to connect a customer and no blockages; or

²⁰¹ We note that according to Openreach's specification for pole loading and overhead cables (2016), only Openreach is allowed to confirm the capacity of a particular pole.

²⁰² This information will potentially allow the telecoms provider to inform the customer if they will receive a visit from both Openreach and the gaining telecoms provider and plan the connection. We also consider that the introduction of SLAs and SLGs will incentivise Openreach to develop suitable processes, for example by developing a database relating to the capacity of poles, as volumes of PIA increase.

- duct available but with insufficient capacity or damage that prevents the telecoms provider from deploying an additional cable to connect the customer; or
- no duct available with the existing lead-in directly buried.

6.178 Where duct has sufficient capacity (and there are no blockages) a telecoms provider can order space in that duct from Openreach and deploy its cable as is currently the case under PIA (without requiring adjustments to Openreach's infrastructure).²⁰³

6.179 In all other circumstances, the telecoms provider will not be able to connect a customer using a BT duct lead-in without adjustments to the infrastructure. We discuss the requirements on Openreach in these circumstances in Section 4.

6.180 In that section, we note that in circumstances where a lead-in duct is blocked or damaged, it may not be practical or economic to repair the existing duct and therefore the lead-in duct may need to be replaced. In those situations, there is not always a clear benefit to requiring Openreach to build a new lead-in compared to competing telecoms providers building their own infrastructure. Similarly, where a duct has insufficient capacity, or the lead-in is directly buried, there is not always a clear benefit to requiring Openreach to build a new lead-in compared to competing telecoms providers building their own infrastructure.

6.181 However, in the case of underground lead-ins where a spine duct is accessible, but the lead-in is not, we consider that Openreach should be required to install a footway box²⁰⁴ outside the property to allow the telecoms provider to connect in to BT's physical infrastructure except in circumstances where there is no clear benefit to Openreach doing so; for example, where a continuous row of premises all have direct buried lead-ins, it is not clear that installing footway boxes will be necessary since there may not be a clear benefit in BT installing multiple footway boxes to allow these premises to access existing spine.²⁰⁵ This requirement will allow competing telecoms providers to make use of spine duct passing the property and leading back to the distribution point.^{206 207}

6.182 In order to assist Openreach and telecoms providers to identify those circumstances where a footway box installation would be appropriate, we consider that a telecoms provider should provide indicative information relating to the type, nature and condition of lead ins associated with premises to which it is proposing to connect to its network,²⁰⁸ something which could be gathered by surveying the distribution

²⁰³ Currently where a telecoms provider wants to connect multiple customers in a street, in some cases, the same section of duct may be used to route lead-in cables back to the distribution point. Each lead-in cable would attract a separate rental charge for the same section of duct. We do not address this in this consultation, but intend to set out specific regulatory proposals for rental charges in a subsequent consultation.

²⁰⁴ We would note that there may be occasions when Openreach may meet its obligations in a manner other than by installing a footway box.

²⁰⁵ This is because it may be less efficient than a telecoms provider by-passing BT's spine duct and deploying its fibre via its own narrow-trench (and footway boxes) akin to the approach used by cable operators.

²⁰⁶ We recognise that Openreach may choose to build lead-in duct as an alternative.

²⁰⁷ Where there is no duct between the distribution point and the customer premises, Openreach would not be required to build duct as part its network access requirement since this infrastructure would extend beyond its network footprint.

²⁰⁸ As part of its network design, a telecoms provider will need to know whether the use of spine duct will also allow it to connect a customer; as such, where there are either blocked underground lead-ins or directly buried lead-ins.

chamber that supplies a set of premises. This information could then be used to determine any adjustment that the telecoms provider is requesting Openreach to make and allow Openreach to consider this request.

6.183 We consider that where the provision of a footway box falls within BT's network access requirement, it is imperative for a telecoms provider to be certain as to the timescales that apply in order to be able to connect a customer (as a result of winning a customer) using that footway box. Therefore, we propose that the PIA Reference Offer includes:

- SLAs and SLGs relating to the timescales for the completion by BT of any works necessary to relieve congested Physical Infrastructure where this comprises the installation of a Footway Box.

6.184 We would expect Openreach to engage with industry before putting in place SLAs and SLGs pursuant to this obligation.

6.185 While we are leaving the specification of our proposed SLAs and SLGs to BT, our expectation is that the SLAs and SLGs put in place will reflect retail customer expectations that when they have contracted with a new telecoms provider, their new service will be provided promptly. If BT fails to put in place sufficiently robust SLAs and SLGs pursuant to this requirement that reflect this, we will not hesitate to use our powers of direction to impose a regulatory requirement on Openreach to provide access (which in this case includes the provision of a footway box) within a specified number of days.

Maintenance

6.186 There is currently a requirement that the PIA Reference Offer include:

- the arrangements for maintenance of cables and associated equipment installed by Third Parties and of the Physical Infrastructure, including the provision for the temporary occupation of additional infrastructure capacity for the installation of replacement cables.

6.187 We have considered whether this continues to be required.

6.188 Following deployment of a network using PIA, there are likely to be instances where BT's duct and pole infrastructure needs to be maintained, repaired or replaced. This work is likely to impact the networks of multiple telecoms providers (including Openreach) that share the duct and pole infrastructure. Accordingly, a process needs to be established and promulgated by Openreach that allows the maintenance, repair and replacement of duct and pole infrastructure in coordination with all users of that infrastructure and in compliance with BT's SMP non-discrimination obligations.

6.189 Telecoms providers also need to be able to maintain their networks so processes for cable maintenance would be an essential feature of the PIA service. These processes are likely to include:

- arrangements for timely access to BT physical infrastructure for maintenance purposes; and
- temporary occupation of additional duct capacity to facilitate the installation of replacements for faulty cables and cable rearrangements.

6.190 Therefore, we propose that the PIA Reference Offer include:

- the arrangements for maintenance of cables and associated equipment installed by Third Parties and of the Physical Infrastructure, including the provision for the temporary occupation of additional infrastructure capacity for the installation of replacement cables.

Proposals for SLA and SLG negotiations

6.191 In the 2017 Quality of Service Consultation we have proposed a set of principles regarding the conduct of the SLA/SLG contract negotiation process in relation to the supply of WLR, LLU and VULA services.²⁰⁹ This approach follows that previously adopted in the 2014 FAMR Statement²¹⁰ and subsequently amended in the 2016 BCMR Statement.²¹¹

6.192 In summary, this approach sets out a defined, structured and open process for the negotiation of SLA/SLG terms and conditions. It reserves a central role for the OTA2²¹² and sets a time limit for negotiations. A set of four principles are specified for the conduct of the contract negotiations and a set of four criteria are specified for the OTA2 to assess whether requests for SLA/SLG negotiations should be facilitated through the process. A more detailed description is provided at paragraphs 8.93 to 8.105 of the 2017 Quality of Service Consultation.²¹³

6.193 We consider that the rationale for applying the principles and the criteria to WLR, LLU and VULA services, as set out in paragraph 8.106 of the 2017 Quality of Service Consultation, is also applicable to PIA services. Moreover, we consider that the application of these principles has worked well in contract negotiations thus far. We therefore propose that the principles and the criteria should also apply to SLA/SLG contract negotiations in respect of PIA services.

Implementation timescales

6.194 If we decide, following consultation, to require Openreach to make the changes to PIA as set out in this section (and elsewhere in this document), we recognise that it would not be in a position to do so immediately. This is because, while our proposals for PIA build on an existing product, they will require Openreach to develop a new PIA Reference Offer. As part of developing a new PIA Reference Offer, Openreach would need to:

- consider how to specify the PIA product appropriately (in light of our proposals);
and

²⁰⁹ See 2017 Quality of Service Consultation, paragraphs 8.86 to 8.107,

https://www.ofcom.org.uk/_data/assets/pdf_file/0033/99645/QoS-WLR-MPF-GEA.pdf

²¹⁰ Ofcom, 26 June 2014. Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 Statement, <https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/telecoms-competition-regulation/narrowband-broadband-fixed/fixed-access-market-reviews-2014/statement>

²¹¹ Ofcom, 28 April 2016. Business Connectivity Market Review Statement,

<https://www.ofcom.org.uk/consultations-and-statements/category-1/business-connectivity-market-review-2015>

²¹² Office of the Telecommunications Adjudicator (OTA2) is an independent organisation tasked by Ofcom to oversee co-operation between communications providers and enable a competitive environment in the telecommunications sector.

²¹³ See 2017 Quality of Service Consultation

- adapt its processes to enable it to deliver the proposed changes
- 6.195 We recognise that to take this forward is likely to require discussions between Openreach and telecoms providers, and that without intervention those negotiations could become protracted and result in uncertainty. We propose to address the risk in two ways.
- 6.196 First, we propose that the OTA2 should facilitate the negotiations.
- 6.197 Second, in order to avoid undue delay and to provide certainty and transparency, we propose to identify key milestones in the development of the products and to set dates by which BT would be required to meet them.
- 6.198 We consider that the following milestones would be appropriate:
- publication of a draft revised PIA Reference Offer, which would provide a checkpoint to allow telecoms providers and us to monitor BT’s progress towards a revised PIA Reference Offer;
 - publication of a final revised PIA Reference Offer, which would provide certainty to telecoms providers about the specification of the PIA product from which point the new PIA Reference Offer will apply.²¹⁴
- 6.199 Although we recognise that BT would need to devote resources to develop its processes, we are not aware of any technical barrier to the development. We therefore consider that allowing BT to recover its reasonable development costs should be sufficient to put BT in a position to overcome any potential operational challenges in delivering a new PIA Reference Offer in the proposed timescales.

Figure 6.3: Proposed implementation timetable

Milestone	Date
Publication of draft revised PIA Reference Offer	within 4 months
Publication of final PIA Reference Offer	within one year

Summary of proposals²¹⁵

6.200 We set out above a number of proposals to impose regulatory requirements pursuant to SMP conditions. For clarity, we summarise our proposals below.

²¹⁴ We would expect that the existing requirements in respect of the PIA Reference Offer would remain in force until the date for implementation of the changes determined by the updated PIA Reference Offer.

²¹⁵ There is currently a requirement in the PIA Reference Offer to include “anything which may reasonably be regarded as being likely to materially affect the availability of the relevant Physical Infrastructure Access”. We have proposed in this document those requirements we consider to be necessary. Therefore, we consider that it is appropriate to remove this provision.

6.201 We identify a number of provisions that we propose should be included in the PIA Reference Offer. Specifically, we propose that the PIA Reference Offer must set out (as a minimum):

- the location of Physical Infrastructure or the method by which Third Parties may obtain information about the location of Physical Infrastructure.
- technical specifications for PIA including:
 - technical specifications for permitted cables and associated equipment;
 - cable installation, attachment and recovery methods; and
 - technical specifications relevant to the repair of existing faulty Physical Infrastructure.
- the methodology for calculating availability of spare capacity in Physical Infrastructure.
- procedures for the provision of information to Third Parties about spare capacity, including arrangements for visual surveys of Physical Infrastructure to determine spare capacity.
- conditions for reserving capacity that shall apply equally to BT and Third Parties.
- conditions for the installation and recovery of cables and associated equipment.
- arrangements for relieving congested Physical Infrastructure, including the repair of existing faulty infrastructure and the construction of new Physical Infrastructure.
- the information that a Third Party is required to provide to BT where that Third Party is requesting the repair of existing faulty infrastructure and/or the construction of new Physical Infrastructure.
- a procedure for BT to announce plans reasonably in advance for new construction of Physical Infrastructure such that Third Parties may request BT to install additional capacity for those Third Parties.
- conditions for Third Parties to gain access to the Physical Infrastructure including if appropriate training, certification and authorisation requirements for personnel permitted to access and work in/on Physical Infrastructure.
- the arrangements for maintenance of cables and associated equipment installed by Third Parties and of the Physical Infrastructure, including provision for the temporary occupation of additional infrastructure capacity for the installation of replacement cables.
- conditions for the inspection of the Physical Infrastructure at which access is available or at which access has been refused on grounds of lack of capacity.
- Service Level Commitments and Service Level Guarantees in relation to the timescales for:

- BT to respond to a request by a Third Party to relieve congested Physical Infrastructure other than a congested Pole, where such a response confirms that the order has been accepted and includes how BT proposes to relieve that congestion;
- completion by BT of any works necessary to relieve congested Physical Infrastructure other than a congested Pole;
- BT to respond to a request by a Third Party to undertake works itself to relieve congested Physical Infrastructure;
- BT to respond to a request by a Third Party to relieve a congested Pole where such a response confirms that the order has been accepted and how BT proposes to relieve that congestion;
- completion by BT of any works necessary to relieve a congested Pole; and
- completion by BT of any works necessary to relieve congested Physical Infrastructure where this comprises the installation of a Footway Box.
- conditions for the provision of forecasts by Third Parties in respect of their future requirements for Physical Infrastructure Access.
- conditions on which Third Parties may elect to undertake build works on behalf of BT.

6.202 We also propose that BT should provide PIA Database Access as an ancillary service to the proposed PIA network access remedy.

Legal tests

Requirement to publish a Reference Offer

6.203 A requirement to publish a Reference Offer has two main purposes: to assist transparency for the monitoring of potential anti-competitive behaviour; and to give visibility to the terms and conditions on which other providers may purchase wholesale services.

6.204 The publication of a Reference Offer would potentially allow for speedier negotiations, avoid possible disputes and give confidence to those purchasing services that they are being provided on non-discriminatory terms. Without this, market entry might be deterred to the detriment of the long-term development of competition and hence consumers.

6.205 We consider that imposing a requirement to publish a Reference Offer is necessary to achieve these aims and effects in the WLA market, where we propose to find that BT holds SMP. We consider that the requirement to publish Reference Offers imposed in previous market reviews has been effective in meeting the aims of the regulation detailed above. Therefore, we propose that BT should be required to publish a Reference Offer for the provision of PIA. This remedy complements our proposals to impose network access requirements (Section 4) and non-discrimination requirements (Section 5).

6.206 The proposed condition requires the publication of a Reference Offer and specifies the information to be included and how it should be published. It prohibits BT from

departing from the charges, terms and conditions in the Reference Offer and requires it to comply with any directions Ofcom may make from time to time under the condition.

- 6.207 For the reasons set out below, we are satisfied that the proposed condition for BT in the WLA market within the UK excluding the Hull Area meets the various tests set out in the Act.
- 6.208 Section 87(6)(c) of the Communications Act 2003 authorises the setting of SMP services conditions requiring the dominant provider to publish, in such a manner as Ofcom may direct, the terms and conditions on which it is willing to enter into an access contract. Section 87(6)(d) also permits the setting of SMP services conditions requiring the dominant provider to include specified terms and conditions in the Reference Offer. Finally, section 87(6)(e) permits the setting of SMP services conditions requiring the dominant provider to make such modifications to the Reference Offer as may be directed from time to time.
- 6.209 We consider that the proposed condition meets our statutory obligations and the Community requirements under sections 3 and 4 of the Act.
- 6.210 The requirement to publish a Reference Offer would, in combination with a requirement not to unduly discriminate, facilitate service interoperability and allow telecoms providers to make informed decisions about future entry into downstream markets. Further, the proposed obligation would enable purchasers to adjust their downstream offerings in competition with BT, in response to changes in BT's terms and conditions. Finally, the proposed obligation would make it easier for Ofcom and other telecoms providers to monitor any instances of discrimination. Therefore, we consider that the proposed condition in particular furthers the interests of consumers in relevant markets by the promotion of competition in line with section 3 of the Act.
- 6.211 We consider that the proposed condition meets the Community requirements set out in section 4 of the Act. In particular, the proposed condition promotes competition and encourages the provision of network access and service interoperability for the purpose of securing efficient and sustainable competition for the maximum benefit of consumers. The publication of a Reference Offer would mean that other telecoms providers would have the necessary information readily available to allow them to make informed decisions about entry into downstream markets.
- 6.212 We also consider that this proposal meets section 47(2) of the Act which requires conditions to be objectively justifiable, non-discriminatory, proportionate and transparent. We consider the proposed condition is:
- objectively justifiable, in that it encourages competition, provides market stability and helps us to monitor discriminatory behaviour through the publication of terms and conditions;
 - not unduly discriminatory, in that it is proposed only for BT which is the only telecoms provider that we propose to find has SMP in the WLA market in the UK excluding the Hull Area;
 - proportionate, in that only information that is necessary to allow telecoms providers to make informed decisions about competing in downstream markets is required to be provided; and

- transparent, in that the condition is clear in its intention that BT publish details of its PIA network access offer.

6.213 For the reasons set out above, we consider that the proposed condition is appropriate to address the competition concerns identified, in line with section 87(1) of the Act.

The BEREC common position and EC Recommendations

6.214 We have taken utmost account of the BEREC Common Position when forming these proposals.²¹⁶

6.215 In relation to the objective of to assist transparency for the monitoring of potential anti-competitive behaviour; and giving visibility to the terms and conditions on which other providers will purchase wholesale services, the BEREC Common Position identifies, among other things, as best practice that:²¹⁷

“**BP26** NRAs should require SMP operators to provide clarity of terms and conditions of access (including those relating to relevant ancillary services) by publishing a Reference Offer (RO), the key elements of which should be specified or approved by the NRA. All material contractual terms and conditions which are known or knowable at the time of publication should be covered clearly.

BP26a NRAs should require SMP operators to take into account any reasonable views of wholesale customers in their RO, in particular regarding the evolution of the services offered.

BP26b NRAs should require SMP operators to publish the RO (i.e. make it operational) within a reasonable time after NRAs have imposed the obligation to grant access. NRAs should give guidance on the reasonable timeframe on a case by case basis.

BP26c NRAs should require SMP operators to update the RO as necessary, and in a timely manner (see BP22), to reflect relevant changes such as developments in line with market and technology evolution and/or changes to prices, terms and conditions for existing services or technical and operational characteristics. Where NRAs follow a pre-approval process, NRAs should further require SMP operators to inform them before publishing the necessary amendments to the RO.

²¹⁶ BoR (12) 127, December 2012. *BEREC Common Position on best practice in remedies on the market for wholesale (physical) network infrastructure access (including shared or fully unbundled access) at a fixed location imposed as a consequence of a position of significant market power in the relevant market*,

[www.berec.europa.eu/files/document_register_store/2012/12/20121208163628_BoR_\(12\)_127_BEREC_COMMON_POSITION_ON_BEST_PRACTICE_IN_REMEDIES_ON_THE_MARKET_FOR_WHOLESAL.pdf](http://www.berec.europa.eu/files/document_register_store/2012/12/20121208163628_BoR_(12)_127_BEREC_COMMON_POSITION_ON_BEST_PRACTICE_IN_REMEDIES_ON_THE_MARKET_FOR_WHOLESAL.pdf).

²¹⁷ In this respect the BEREC Common Position identifies as a competition issue that SMP operators may have an incentive to discriminate in favour of their own downstream operations in relation to the quality of wholesale access products. As a result, access products may not be of reasonable quality and service levels may not be comparable with those provided by the SMP operators to their own downstream businesses.

BP26d Where applicable, NRAs should impose an obligation on SMP operators in relation to the minimum amount of information to be made available in the RO.

BP26e After lifting an obligation to apply a RO, NRAs should ensure that SMP operators provide provisions for the change in the contractual conditions which are in place on the basis of that RO for a transitional period to be determined accordingly.”

6.216 In relation to the objective of achieving reasonable quality of access products (operational aspects), the BEREC Common Position identifies, among other things, as best practice that:

“**BP32** NRAs should require SMP operators to provide a reasonable defined level of service.

BP32a Service Level Agreements (SLAs) should cover specific service areas. Services areas when SLAs are most likely to be necessary are ordering, delivery, service (availability) and maintenance (repair).

BP32b SLAs should be made available to wholesale operators. To ensure maximum transparency and comparability of the terms provided by SMP operators to alternative operators and their downstream arm, all SLAs could be made available to all relevant wholesale customers (including those outside from a specific Member State). For example, SMP operators could make them available on demand or automatically publish these on their website (as part of their RO).

BP32c NRAs should take oversight for the process of setting SLAs. NRAs should determine the level of their involvement in this process by taking into account specific market circumstances and particular concerns for discriminatory behaviour.

BP33 NRAs should impose a generic requirement on SMP operators to provide Service Level Guarantees (SLGs).

BP33a SLGs should cover all necessary specific service areas. Service areas where SLGs are most likely to be necessary are ordering, delivery, service (availability) and maintenance (repair).

BP33b SLG payments should be made without undue delay and should be proactive in nature. That is, with a pre-established process for the payment and billing of the SLGs among operators and without the need for alternative operators to request the intervention of any third party i.e. NRAs or courts.

BP33c NRAs should take oversight for the process of setting SLGs. NRAs should determine the level of their involvement in this process by taking into account specific market circumstances and particular concerns for discriminatory behaviour.”

6.217 We consider that our proposals are consistent with the best practice set out in the BEREC Common Position.

Consultation questions

Question 6.1: Do you agree with our proposed approach to the processes and systems relating to planning and surveying? Please provide reasons and evidence in support of your views.

Question 6.2: Do you agree with our proposed approach to the processes for build works and enabling works? Please provide reasons and evidence in support of your views.

Question 6.3: Do you agree with our proposed approach to processes relating to the connecting the customer stage? Please provide reasons and evidence in support of your views.

Section 7

Price regulation of PIA

Introduction

- 7.1 In this section we set out our proposed approach to pricing remedies with respect to PIA. While the exact details of the approach and proposed SMP conditions will be set out in a subsequent consultation document, which we plan to publish in the summer, we set out below the approach we anticipate taking.
- 7.2 We first discuss the form of price regulation we think is appropriate for PIA rental and ancillary charges. We then set out our proposals for how certain costs incurred by Openreach in relation to the provision of PIA should be recovered. We consider recovery of the following two categories of cost:
- Network adjustment costs: costs which Openreach will incur in making adjustments to its network where this is necessary for its physical infrastructure network to be available to telecoms providers for the purpose of deploying their own networks.
 - 'Productisation' costs: costs which Openreach has already incurred, or will incur, setting up and managing the PIA product, and processing PIA orders.

Appropriate form of price regulation

- 7.3 PIA comprises a number of products and services which Openreach sets individual charges for. These fall into the following two broad categories:
- rental charges which relate to infrastructure sharing, including duct, pole, joint box and manhole sharing; and
 - ancillary charges which relate to supplementary services or activities which Openreach carries out on behalf of a telecoms provider using PIA, including accreditation, processing activities, survey activities, and new infrastructure build and enabling works.
- 7.4 Under the current PIA remedy, rental and ancillary charges are subject to a 'basis of charges' condition which requires that prices are reasonably derived from the costs of provision based on a forward looking long run incremental cost approach, allowing an appropriate mark up for the recovery of common costs, including an appropriate return on capital employed.

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- 7.5 Our initial view was that a basis of charges condition may not provide potential investors with sufficient certainty as to the level of rental charges they would face, undermining the effectiveness of the PIA remedy. We considered that a cap on the level of rental charges would provide greater certainty to investors and said that it may be appropriate to set a control based on BT's current methodology for calculating charges. We identified further guidance as an alternative potential way to provide some greater certainty over the level of PIA rental charges.

- 7.6 In relation to ancillary charges, our initial view was that the current basis of charges condition remains appropriate. We said that some ancillary charges relate to activities which telecoms providers can carry out themselves, whereas others may become less important or fall away completely given our other proposals.

Stakeholder responses to the 2016 PIA Consultation

- 7.7 Many stakeholders considered a charge control based on a cost model developed by Ofcom would be the most appropriate form of price regulation for rental charges. Other forms of price cap were also considered as acceptable, at least as an interim solution. Openreach and Virgin Media were the exception, and considered the current basis of charges condition as sufficient. In particular, Openreach argued that the potential benefits of imposing a charge control are limited while the risks are significant.
- 7.8 Stakeholders generally agreed that there are challenges in implementing a charge control however some believed these challenges can be overcome more rapidly than we considered in our 2016 PIA Consultation. With regards to the use of the current methodology as a basis for setting a charge control stakeholders' views varied.
- 7.9 In relation to ancillary charges, some stakeholders considered the current basis of charges condition acceptable, at least as a starting point. Others argued a charge control would be more appropriate. Openreach highlighted the risk of a charge control in distorting the 'build or buy' signals and suggested price regulation on comparable products serves as a benchmark for ancillary charges.

Our Proposals

Some form of price regulation on PIA is required

- 7.10 We consider that some form of price regulation is required to support an obligation to provide PIA.
- 7.11 Given our provisional conclusion that BT has SMP in the WLA market, it is likely that BT would have the incentive and ability to set excessively high prices for PIA. In particular:
- There is a risk that BT sets excessive prices to maximise the profit it earns from providing access to its physical infrastructure.
 - There is a risk that BT would set excessively high prices to increase the overall cost of building a network using PIA, with the intention of preventing or limiting the emergence of further network competition by undermining the investment case for network deployment based on PIA.²¹⁸
- 7.12 Price regulation guards against the risk that BT engages in such behaviour. Adverse price effects could undermine the case for investment by competing telecoms providers and so undermine the effectiveness of the obligation to provide PIA, and

²¹⁸ Even if telecoms providers ultimately deploy competing networks using PIA, there is a risk that BT would set excessively high prices to favour its own downstream businesses (which do not consume PIA as an input), putting rivals that have deployed a competing network using PIA at a competitive disadvantage. In addition, knowing that BT has the ability and incentive to increase prices in the future (to favour its own downstream businesses or maximise profit) could also deter competitive network investment from happening in the first place.

could also result in higher retail prices, all of which is ultimately against the interests of consumers.

- 7.13 Consequently, it appears to us from the market analysis we have carried out that there is a relevant risk of adverse effects arising from BT fixing or maintaining its prices at an excessively high level, so as to have adverse consequences for end-users of public electronic communications services.

Certainty as to the level of charges for PIA is important

- 7.14 We remain of the view that certainty and predictability over the level of charges for PIA is necessary to fully support investors' ability to build a viable business case for network deployment using PIA. Although the charges for PIA in a given year will be relatively modest compared to the significant upfront costs of deploying a network using PIA, network investment decisions are typically evaluated over a long time horizon, over which time the total PIA charges could represent a material proportion of total costs over the lifetime of the investment.
- 7.15 We recognise that we typically set price regulation only for the duration of the review period, whereas investors require certainty over a longer period. However, we do not agree with Openreach's suggestion that pricing certainty is restricted to a three year horizon.²¹⁹ We cannot prejudge what actions we will take in the future, as any pricing decisions in future reviews will be made in the light of the circumstances and legal framework applicable at that time. However, our proposals seek to implement our longer term strategy to promote greater network competition and therefore we expect future reviews to consider how any pricing decisions can support this goal. More generally, we recognise the importance of regulatory consistency and predictability over time. We think that investors will place considerable weight on us providing proper constraints on Openreach's ability to set inappropriate charges in the long run and in the short run.
- 7.16 In what follows we consider the approach to rental charges first, then ancillary charges.

PIA rental charges

The current basis of charges condition on rental charges does not provide sufficient certainty

- 7.17 The specific methodology currently adopted by Openreach to derive PIA rental charges is just one of a number of possible ways in which those charges could be set since under the existing basis of charges condition, Openreach has freedom to revise the methodology with potentially significant impacts on the charges payable by PIA users. Openreach may, therefore, have scope to change the methodology in a way that might undermine the effectiveness of the remedy.
- 7.18 PIA rental charges generally comprise two parts: asset costs and 'productisation' costs.²²⁰ Asset costs reflect the contribution to the cost associated with the underlying asset to which access is granted. The current methodology specifies how the total

²¹⁹ Openreach response to the 2016 PIA Consultation, paragraphs 273 and 277.

²²⁰ Rental charges for cable up a pole and pole top equipment do not include any productisation costs. Annex 5 of the 2016 PIA Consultation provided an overview of BT's current methodology for setting PIA rental charges.

value of the asset type (e.g. the value of all duct) is allocated to the particular infrastructure being accessed (e.g. each metre of duct), and what proportion of this allocation should be recovered from the telecoms provider gaining access. Asset costs make up a high proportion of overall rental charges (more than 50% in some cases²²¹), so a change in the way these costs are allocated or apportioned to PIA users could result in a significant change in rental charges.²²²

- 7.19 For example, Openreach has flexibility to change how asset costs are allocated to the different PIA products (one way is that Openreach could change the methodology for allocating duct costs between the different duct sizes i.e. 1 bore, 2 bores, 3+ bores duct). It could also change the methodology determining the proportion of asset costs to be apportioned to PIA users versus Openreach's own downstream products that use the physical infrastructure (for example, for duct, this is currently based on the actual space used by BT's cables and sub-ducts converted into the equivalent space that would be occupied by 25mm sub-ducts).
- 7.20 Openreach²²³ and Virgin Media²²⁴ argue that the current basis of charges condition remains appropriate because it has delivered pricing stability in the past and there is no evidence of Openreach having exploited its pricing flexibility. However, our view is that the current PIA remedy is ineffective for a number of reasons, meaning that Openreach has had very little incentive to exploit its pricing flexibility. Going forward, in light of our objective of promoting investment in competing networks at scale and the changes we are proposing to make the remedy effective, we consider that Openreach could have much stronger incentives than in the past to exploit this flexibility, in order to undermine investment in new infrastructure by competitors.
- 7.21 We remain of the view that the current basis of charges condition does not provide potential investors with sufficient certainty as to the level of PIA rental charges they would face.

A maximum cap on PIA rental charges is required

- 7.22 We consider that our duties are best met by addressing the excessive pricing risk we have identified through a cap on rental charges, as this will provide investors with greater certainty over the level of PIA rental charges and thus facilitate building a credible business case for deploying a network using PIA.
- 7.23 While in some other charge controls we have applied a price cap based on BT's fully allocated costs, we do not consider this to be practicable for PIA rental charges for this review period, for a number of reasons:
- The necessary cost data is not reported to the required level of granularity in BT's accounting systems. For example, Openreach sets different PIA rental charges for different types of duct on a per metre basis, as well as separate rental

²²¹ Based on the updated PIA pricing model provided to Ofcom on 12 August 2016.

²²² When we imposed the PIA obligation in 2010, we said that our interpretation of the basis of charges condition would be that BT's prices must, as a first-order test, be between Distributed Long Run Incremental Cost (DLRIC) and Distributed Stand Alone Cost (DSAC). Although only a first order test – and therefore not determinative of compliance or otherwise with the basis of charges condition – information provided by Openreach suggests that PIA rental charges based on DSAC would be between 1.2 and 3.2 times higher than the current PIA rental charges (based on the updated PIA pricing model provided to Ofcom on 26 October 2016). 2010 WLA Statement, paragraphs 5.58 and 5.79.

²²³ Openreach response to the 2016 PIA Consultation, paragraphs 269-270.

²²⁴ Virgin Media response to the 2016 PIA Consultation, pages 14-15.

charges for using manholes and joint boxes. However, BT's accounting systems report the costs of duct, manholes and joint boxes in aggregate. Obtaining data on the granularity required, which might include making changes to the way BT reports physical infrastructure within its regulatory financial accounting systems, could take a significant amount of time to implement.

- The lack of granular cost data also means that it would be challenging to set PIA rental charges for the current products at a level which would ensure that other telecoms providers are not disadvantaged compared to Openreach, whose downstream products do not currently consume PIA. Specifically, it is not currently possible to accurately compare the contribution to cost recovery made by BT's downstream products with the contribution made by other telecoms providers using PIA.²²⁵ BT would need to change the way it reports physical infrastructure within its regulatory financial accounting systems to be able to do this. This could take a significant amount of time for Openreach (in discussion with us) to investigate and implement.
- Such an approach is likely to be dependent on forecasts of costs and volumes.²²⁶ Given the uncertainty about take-up of PIA by other telecoms providers at this stage, our view is that the risk of forecast error seems high.

7.24 In light of these challenges, we set out two possible approaches in the 2016 PIA Consultation, and both found some support among stakeholders:

- imposing a cap on rental charges based on BT's current methodology (albeit with some changes); or
- imposing a basis of charges condition similar to the one currently in place, but supplemented with further guidance on the approach we would take as a starting point to assessing PIA rental charges under the basis of charges condition, potentially specifying particular aspects of the methodology we might adopt.

7.25 Stakeholders also suggested alternative approaches for providing more certainty about PIA pricing:

- supplementing the current basis of charges condition with a cap on annual price changes or putting in a 'cap and collar' arrangement referenced to a relevant cost of living index;
- mandating long-term contracts, giving PIA users a range of options beyond the five-year minimum term currently in place, or explicit long-term charges based on the charges that apply at the time of ordering the service; and
- regulating charges for a longer time period, for example, by stipulating that the rental price cap set at the beginning of the review period should be considered

²²⁵ BT does not currently report the costs of the physical infrastructure assets consumed internally to the same level of detail as the PIA products offered externally. For example, Openreach sets different PIA rental charges for different types of duct on a per metre basis, as well as separate rental charges for using manholes and joint boxes. However, BT does not report its internal consumption of duct at this level of detail; rather, BT's downstream products contribute to duct, joint box and manhole costs in aggregate and on a per line basis (with the level of this contribution varying by end product).

²²⁶ For example, forecasts of total physical infrastructure costs and volumes, as well as forecasts of internal and external consumption of physical infrastructure.

the long-term maximum price, or by issuing guidance on our long-term approach to pricing, including principles for future market reviews.²²⁷

We propose to impose a cap using the current methodology as a starting point for our calculations

- 7.26 Having considered the alternative approaches, our provisional view is that imposing a cap on rental charges using the current methodology as a starting point for our calculations is likely to be an appropriate approach in this review period. In particular, this would be an effective and pragmatic means of providing certainty to investors over the market review period and would result in PIA rental charges being at a level which should avoid undermining network investment.
- 7.27 We consider other approaches are less appropriate in this case for the following reasons:
- Supplementing the current basis of charges condition with guidance would be unlikely to provide the level of certainty needed by investors in the context of large scale network investments. Any guidance would rely on the ex-post dispute mechanism, which can take a significant amount of time to resolve, thus extending the period of uncertainty to a point at which telecoms providers might find it difficult to build a credible business case.
 - Other alternatives, such as supplementing the current basis of charges condition with a cap on annual price changes or mandating long-term contracts, are unlikely to be effective without also controlling the level of charges at the start. Although future price changes would be limited to some extent, the initial level of charges could make PIA unattractive.
 - Uncertainty about future take-up of PIA and changes in costs make forecasting challenging. This gives rise to particular difficulties in attempting to specify prices over an extended period.²²⁸
- 7.28 We will set out detailed proposals and reasoning in a further consultation.

Ancillary charges

- 7.29 Ancillary charges relate to a variety of supplementary services or activities which Openreach carries out on behalf of a telecoms provider using PIA.²²⁹ We remain of the view that there is less need to go further to address the importance of certainty over the level of these charges than for PIA rental charges. This is because many of these charges reflect largely incremental costs (as opposed to rental charges which

²²⁷ Some stakeholders have suggested that greater certainty could be achieved by simplifying the structure of rental charges, e.g. removing the distinctions based on the number of bores in a duct or single- versus multi-user drops. Another suggestion was to introduce a process for terminating rental charges where a telecoms provider relinquishes the use of an Openreach asset (e.g. a hybrid lead-in). We consider that both these points are relevant to the detailed implementation of our selected approach, which we will cover in a subsequent consultation.

²²⁸ In a further consultation, we will consider more fully the period over which the price cap should apply.

²²⁹ Some of the existing ancillary charges will fall away due to changes Openreach has already made to the PIA product, and changes resulting from our proposals elsewhere in this document. Therefore, we do not need to consider these charges further.

reflect common costs to a large extent). In addition, in some cases ancillary charges can be avoided by telecoms providers undertaking the relevant work themselves.

- 7.30 Therefore, we propose to retain the current basis of charges condition for ancillary charges (with the exception of ancillary charges for network adjustments which we discuss below).²³⁰

Recovery of network adjustment costs

- 7.31 In Section 4, we explain that the PIA network access obligation should include a requirement on Openreach to make certain adjustments to its network where this is necessary for its physical infrastructure network to be available to telecoms providers for the purpose of deploying their own networks, including relieving congested physical infrastructure.
- 7.32 Currently, Openreach offer a range of possible network adjustments, including 'build and enabling' works (for example, new duct, chambers or poles, and replacement poles) and 'blockage clearance', as an ancillary service to the PIA product. Telecoms providers pay the full upfront cost of any works they request through ancillary charges.
- 7.33 As explained in below, we consider that the general basis of charge condition is not suitable for network adjustment costs, and specific arrangements are required.

2016 PIA Consultation

- 7.34 In the 2016 PIA Consultation, we considered that the current charges for build and enabling works could act as an impediment for a telecoms provider looking to use PIA on a large scale. In particular, we said that charging telecoms providers the full cost of adjustments puts them at a disadvantage to BT, as any build and enabling costs which Openreach incurs to support BT's own network deployment are recovered across all users of its physical infrastructure. We also explained that as infrastructure has to be built in standard increments, telecoms providers will often have to pay for infrastructure that they do not fully utilise and which can be used by Openreach for other purposes in future.
- 7.35 We proposed that Openreach should recover costs in the same way whether it upgrades its infrastructure to accommodate BT's network or a competitor's network. In practice, this would involve Openreach recovering the costs of network adjustments required by competing telecoms providers over all products that use BT's physical infrastructure. It would not use ancillary charges to recover the full costs of these works directly from the telecoms provider that requests them.
- 7.36 We considered that there were a number of benefits to this proposal: it would ensure telecoms providers are not at a disadvantage compared to BT; it would reduce both the level and unpredictability of PIA costs faced by telecoms providers; and it would reflect that the infrastructure is a shared asset and that adjustments would support further network competition.

²³⁰ We consider that this should extend to additional supplementary services or activities which Openreach introduces in future.

Stakeholder responses to the 2016 PIA Consultation

- 7.37 Stakeholders were divided on our proposal that Openreach should recover the cost of adjustments from all products that use BT's physical infrastructure.
- 7.38 Arguments in favour of our proposed approach included that:
- it would facilitate competitive fibre deployment;
 - it would provide Openreach with the incentive to minimise costs; and
 - some of the adjustments would be required irrespective of rollout by PIA users.
- 7.39 Most of the arguments against our proposed approach were made by Openreach and, to a lesser extent, Virgin Media. These included that:
- our proposal would promote inefficient entry as telecoms providers would not face the full costs of rolling out FTTP;
 - our proposal would not ensure equivalence, rather, it would put Openreach at a disadvantage as Openreach would take the costs of any network adjustments into account when deciding whether to deploy a network unlike other telecoms providers using PIA;
 - our proposal would transfer substantial additional costs and risk on to Openreach which it would not be able to control, and would also impact on Openreach's ability to invest in its own infrastructure projects;
 - our proposal could result in significant price increases, with customers in rural areas paying for improved infrastructure in selected urban areas which they are unlikely to benefit from; and
 - our proposal requires Openreach to charge higher prices, undermining its ability to compete with Virgin Media.

Our Proposals

- 7.40 We have considered the appropriate approach for recovering network adjustment costs, bearing in mind the aim of the PIA remedy to promote greater network competition, addressing the competition concerns we have identified in the WLA market.

The current approach undermines the effectiveness of the PIA remedy

- 7.41 We remain of the view that Openreach's current approach of charging the telecoms provider the full cost of adjustments undermines the effectiveness of the PIA remedy. We explain the reasons for this below.
- 7.42 Our rationale for requiring BT to provide network access in the form of PIA is to promote competition by reducing the absolute costs and time required to build ultrafast broadband networks at scale, facilitating investment in competing infrastructure. The network access obligation includes a requirement for Openreach to make adjustments to the existing infrastructure so that it is 'ready for use' – for example, repairing faulty infrastructure and relieving congested sections where necessary.

- 7.43 Charging telecoms providers the costs of making the specific repairs and adjustments that are necessary to make a particular part of Openreach's existing infrastructure ready for use, is inconsistent with the way Openreach recovers the costs of network adjustments to accommodate BT's network deployment. When Openreach makes adjustments to its physical infrastructure to support BT's network deployment, it recovers the costs of those adjustments across all users of its physical infrastructure via depreciation charges on all products which use the physical infrastructure.
- 7.44 Openreach argued that, while it allocates these costs across services, this does not mean that BT considers this fact when making investment decisions. However, the ability to spread costs in this way reduces the risk associated with BT's network investments. This is because, even if the investment ultimately fails to generate the incremental revenues required to cover the total costs of the investment, the costs of the network adjustments can still be recovered from products in markets in which BT has SMP. In contrast, other telecoms providers must currently bear the full cost of any adjustments required to support their network deployment, increasing the risk of the investment relative to Openreach. Knowing that BT has this unmatched competitive advantage could undermine incentives to invest in network deployment in the first place.²³¹
- 7.45 In addition, charging telecoms providers the full cost of making the existing infrastructure useable adds to the cost and risk associated with building a rival network using PIA, and therefore acts as a barrier to competitive network investment at scale. For example:
- Infrastructure has to be built in standard increments, meaning that telecoms providers will often have to pay for infrastructure that they do not fully utilise. For example, where poles are damaged, telecoms providers will have to pay for a replacement pole, irrespective of the number of dropwires they intend to attach. Similarly, where it is necessary for Openreach to provide additional underground capacity, telecoms providers will have to pay for an additional duct bore or chamber, even though they only require a fraction of the space. Moreover, the telecoms provider that pays for these adjustments will not subsequently have ownership of them such that they can utilise the extra capacity to generate revenues in future.
 - Openreach controls the level of cost incurred in undertaking each network adjustment as it has a degree of flexibility about how to make the physical infrastructure useable. As explained in Section 4, this provides Openreach with flexibility to choose the most efficient solution possible where it has more than one option available, and allows it to take account of its own future requirements. However, under the current approach where Openreach recovers the full costs of any adjustments from the telecoms provider requesting them, Openreach has little incentive to select the lowest cost. Further, given network adjustments are necessary and therefore unavoidable to make use of Openreach's physical infrastructure, in principle Openreach may have the incentive and ability to select

²³¹ In its response to the 2016 PIA Consultation, Openreach argued that its accounting system approach to allocate, and average, the costs of necessary works across services does not mean that BT considers this fact at the investment stage. In our view, the fact that BT could take into account the risk-reducing benefits of pooling and spreading network adjustment costs is enough to deter competitive network investment, irrespective of whether BT has actually taken this into account in its investment decisions to date.

the costliest option to drive up the costs faced by a rival telecoms provider.²³² Knowledge of this is likely to deter competitors from investment at scale.

- As the full extent of the network adjustments required will be uncertain when undertaking business planning, the level of expenditure required to make the physical infrastructure useable will be unpredictable. For example, some network adjustments are not identifiable without a field survey (for example, pole capacity constraints), whereas others cannot be identified until the network deployment stage (for example, blockages in duct).²³³ This increases the risk associated with the business case for competitive network deployment, such that telecoms providers might be deterred from investing at scale.
- The fact that Openreach recovers the costs of network adjustments to support BT's network deployment across all users of its physical infrastructure means that PIA rental charges will contribute to the costs of network adjustments required to support BT's G.fast or FTTP deployments. In contrast, PIA users receive no contribution from other users of the physical infrastructure toward the costs of network adjustments required to support their own network deployment.²³⁴

7.46 Therefore, we consider that charging telecoms providers the full upfront cost of making the existing infrastructure useable undermines the effectiveness of the PIA remedy as a basis for scale roll-out of ultrafast broadband networks.

Openreach should recover network adjustment costs over all users of the infrastructure

7.47 We remain of the view that Openreach should recover the costs of network adjustments for other telecoms providers in the same way it has historically adopted, and currently adopts, in relation to BT's network deployment. Specifically, Openreach should recover these costs over all products in markets in which BT has SMP and which use Openreach's physical infrastructure (including PIA).²³⁵ We consider that this is necessary in order to realise the significant benefits resulting from other telecoms providers deploying ultrafast networks at scale, for the reasons set out below.

7.48 As explained in Section 5, we are proposing to impose a non-discrimination requirement that should be as close to EOI as possible. This means that even where Openreach does not consume PIA as an input to its downstream services, the way in which it recovers the costs of network adjustments to support those downstream services should not differ from the way it recovers the costs of network adjustments required by PIA users. Recovering the costs of network adjustments in the same way

²³² For example, where a telecoms provider requests capacity on a capacity constrained pole, Openreach can choose the costlier option of replacing the pole, even in cases where lower cost options such as removing or replacing existing dropwires could be more appropriate.

²³³ Even where information is available at the desk planning stage (for example, duct capacity constraints), this information is not always complete, and the accuracy of this information cannot be guaranteed.

²³⁴ We understand that, under the current approach, Openreach also includes new or uplifted assets requested by PIA users in its asset base, resulting in over-recovery of these costs. Costs are recovered once from the telecoms provider requesting the adjustment through ancillary charges, and then start to be recovered again from all users of the physical infrastructure (including the telecoms provider requesting the adjustment through PIA rental charges).

²³⁵ By way of shorthand, in what follows we refer to these products as 'SMP products that use the physical infrastructure'.

whether these are undertaken to accommodate BT's network or a competing telecoms provider's network ensures that telecoms providers are not at a disadvantage to BT.²³⁶

7.49 This approach also reflects the fact that duct and pole infrastructure is a shared asset which benefits a range of downstream services. Openreach as well as other telecoms providers can be expected to benefit from adjustments to the physical infrastructure network overall. As physical infrastructure has a long asset life, past infrastructure investments will provide useable capacity for new fibre networks, and similarly infrastructure investments made now to support new fibre networks will provide useable capacity for future networks. Moreover, Openreach will need to undertake some network adjustments irrespective of requests from PIA users, to maintain its duct and pole network so it can support its own products (for example, replacing defective poles). Another telecoms provider may require a repair in advance of when Openreach schedules this work, and so in this case is only bringing forward costs which Openreach will incur anyway. In addition, some network adjustments may relate to maintenance that Openreach should already have undertaken.²³⁷

7.50 We have considered whether an alternative approach where telecoms providers and BT would each bear the incremental costs of any adjustments associated with deploying their own networks could also ensure a level playing field and support competitive investment. Under this approach, Openreach would not be able to recover the incremental costs of network adjustments to accommodate BT's network deployment from other products in markets in which it has SMP.²³⁸ However, we do not think this approach would be effective for the following reasons:

- Given the point above that the physical infrastructure is a shared asset, it is very difficult to identify the costs of a network adjustment which are genuinely incremental to either BT's or a telecoms provider's network deployment. Moreover, we do not consider that it would be appropriate to leave Openreach to decide this, as it could have the incentive and ability to identify costs in a way that puts competing telecoms providers at a disadvantage, and this would be challenging to monitor.²³⁹
- Moreover, charging the full cost incurred in undertaking any network adjustments required to support a network deployment is likely to deter competitive network investment at scale for the reasons set out in paragraph 7.45 above. In contrast,

²³⁶ We do not agree with those stakeholders that argued that this approach would put BT at a disadvantage to other telecoms providers using PIA. BT would also be able to take into account the fact that the costs of any network adjustments are recovered across all products that use Openreach's physical infrastructure when deciding whether to undertake further network deployment.

²³⁷ Ofcom's Review of BT's Quality of Service found Openreach has not been using as much capital as is necessary to replace the assets that have reached the end of their useful life, in order to maintain its copper access network. Ofcom, March 2017. *Quality of Service for WLA, MPF and GEA*, https://www.ofcom.org.uk/data/assets/pdf_file/0033/99645/QoS-WLR-MPF-GEA.pdf

²³⁸ In its response to the 2016 PIA Consultation, Openreach suggested that if Ofcom is trying to ensure that Openreach's fibre broadband products and a competing ultrafast product built using PIA have equivalent infrastructure costs allocated via regulated accounts, it may be more appropriate to amend cost allocations to Openreach's own fibre broadband products. Openreach response to the 2016 PIA Consultation, paragraph 94

²³⁹ For example, Openreach might argue that network adjustments undertaken to support its own network deployments are part of a general programme to maintain and improve its physical infrastructure and so are not incremental to the network deployment.

our proposed approach would reduce these barriers by reducing the cost and risk associated with building a rival network using PIA.

- 7.51 Our proposed approach has the additional benefit of providing Openreach with the incentive to select the most efficient approach to relieving congested infrastructure.

A financial limit should apply to network adjustment costs

- 7.52 We recognise that there is a degree of uncertainty around the total costs Openreach will be required to recover across all SMP products that use the physical infrastructure. To some extent, Openreach can predict the need for network adjustments, and the likely costs of these works. Openreach can use the information it holds about the state of its infrastructure to estimate the likely incidence of faults in its infrastructure (for example, the number of blockages per kilometre of duct, the proportion of poles which are defective), or the amount of infrastructure which is at capacity. Openreach also has knowledge of the likely cost of undertaking different types of network adjustments. However, such an exercise is still uncertain for the following reasons:

- The quality and completeness of the information Openreach holds about the state of its infrastructure varies considerably.
- Even if the cost of most network adjustments is expected to fall within a certain range for that particular type of work, there are likely to be extreme cases where the cost is significantly higher due to exceptional factors.
- Some network adjustments are more difficult to anticipate as their necessity will depend on the facts of each specific request. For example, this is especially true of network adjustments related to insufficient capacity up to the distribution point (i.e. in spine duct or chambers, or on feeder poles), where the factors we have identified which are likely to be relevant will depend on the specific request (i.e. the amount of additional capacity required, and the length of additional duct required).²⁴⁰

- 7.53 Given this uncertainty around the total costs Openreach will be required to recover across all SMP products that use the physical infrastructure, there is a risk that our proposal has a greater impact on Openreach (in terms of its financial impact) and consumers (due to higher prices) than we anticipate.

- 7.54 We also recognise that requiring Openreach to recover the costs of network adjustments across all SMP products that use the physical infrastructure is likely to increase the incentive on telecoms providers using PIA to request changes to Openreach's physical infrastructure which are not strictly necessary, given they do not face the full cost of these network adjustments. For example, telecoms providers encountering capacity constrained spine duct may be less inclined to seek out alternative routes, or look for ways to make more efficient use of the existing capacity

²⁴⁰ This is in contrast to some other network adjustments which are easier to anticipate. For example, we expect Openreach will need to repair or unblock existing infrastructure which is unusable, therefore the need for these network adjustments is determined simply by the current state of the physical infrastructure. Similarly, we expect Openreach to provide additional capacity on distribution poles where required.

available. This could result in higher costs than necessary being imposed on Openreach, and ultimately consumers.

- 7.55 To mitigate these risks, we propose to apply a financial limit on the network adjustment costs that Openreach should be required to recover in this way. Openreach would recover the costs of network adjustments up to the financial limit from SMP products that use the physical infrastructure (including PIA), and any costs incurred above the financial limit would then be recovered directly from the telecoms provider requesting the network adjustment, through ancillary charges.²⁴¹ The application of ancillary charges for network adjustments would therefore be similar in methodology to how charges for any additional construction required for Ethernet Access Direct (EAD) services are currently applied.²⁴² In that case, the first £2,800 of excess construction charges is exempt (and recovered from all EAD services through connection charges), but any excess construction charges above this amount are payable by the telecoms provider ordering the service.²⁴³
- 7.56 In our view, imposing a financial limit would provide greater certainty over the total costs Openreach will be required to recover across all SMP products that use the physical infrastructure. It would also reduce the incentives on telecoms providers to request changes to Openreach's physical infrastructure which are not necessary, as doing so would increase the likelihood that they ultimately exceed the limit, after which they would need to pay the full cost of any network adjustments.²⁴⁴
- 7.57 In terms of setting the financial limit for network adjustments, this would need to be based on estimates of the incidence and cost of the network adjustments required to make Openreach's physical infrastructure available for the purposes of deploying rival networks. We propose to rely on information held by Openreach on the condition and capacity of its physical infrastructure, and the costs of different types of work, as the basis for these estimates.^{245 246}
- 7.58 In general terms, we consider that the financial limit should be sufficient to cover the costs of normal network adjustments that are necessary to make Openreach's physical infrastructure available for the purposes of deploying rival networks, but it

²⁴¹ This would also mean that when Openreach incurs internal costs related to duct and pole access, it recovers these in a comparable way to the costs associated with PIA, rather than from downstream services where it has SMP. This is discussed further in Section 5.

²⁴² Albeit the rationale differs.

²⁴³ Ofcom, February 2014. *Excess Construction Charges for Openreach Ethernet Access Direct*, https://www.ofcom.org.uk/_data/assets/pdf_file/0023/80591/excess-construction-charges.pdf

²⁴⁴ For the avoidance of doubt, the financial limit does not define the extent of the obligation on BT to make network adjustments. The extent of the obligation should be determined by reference to the guidance set out in Section 4. A request falling within the financial limit would not automatically mean Openreach is required to undertake the network adjustment; rather, as set out in Section 4, we consider that where Openreach refuses a request for network access, Openreach should provide reasons for doing so.

²⁴⁵ BT's FTTC and FTTP business modelling contain assumptions about the incidence and cost of physical infrastructure works to support these network deployments. We also know that Openreach holds information relating to (i) the incidence of duct blockages and the cost of unblocking / repair; (ii) the number of poles which are defective and the cost to replace poles; (iii) the capacity available in its ducts and the cost of installing new duct; (iv) the capacity available on distribution poles.

²⁴⁶ The information we have seen points to significant differences in the physical infrastructure by geography, which is likely to result in variation in the costs of network adjustments across the UK. Moreover, for some network adjustments, Openreach will have multiple options for relieving the congested infrastructure, with potentially quite different costs. We will consider the appropriate approach to determining the financial limit in light of these factors in our subsequent consultation.

does not need to be sufficient to cover exceptional cases where the cost of a network adjustment is significantly higher than the average cost for that particular type of work. We think this approach appropriately balances mitigating the risks identified above and providing telecoms providers with a high degree of confidence that the costs of network adjustments will be recovered across all products using the physical infrastructure (but for exceptional cases).

7.59 As to how the financial limit should be applied, we propose to set a financial limit based on the scale of the deployment using PIA, reflecting the primary drivers of the total cost of network adjustments. Our initial view is that it may be appropriate to set separate financial limits for network adjustments in two different parts of the physical infrastructure. This would reflect the different ways in which the scale of a network deployment is measured in different parts of the duct and pole network. It will also reflect when the infrastructure is likely to be used given the likely reality of building a network up to the distribution point, but then only connecting customers on demand:

- A financial limit covering all network adjustments to physical infrastructure up to the distribution point (i.e. repairing, unblocking or providing additional capacity in spine duct or chambers, or on feeder poles), where the primary measure of scale of deployment appears to be distance.²⁴⁷ The financial limit would be calculated and applied to each order on a per kilometre basis (i.e. £X per kilometre applied to the total number of kilometres of physical infrastructure in a particular order).
- A financial limit covering all network adjustments related to lead-ins,²⁴⁸ where the primary measure of scale of deployment appears to be the number of individual premises, since each lead-in is generally unique to a single premises.²⁴⁹ The financial limit would be calculated and applied on a per premises basis (i.e. £X per premises). We observe that there is generally less uncertainty about the need for network adjustments related to lead-ins given their necessity is less dependent on the facts of each specific request.²⁵⁰

Implementation

7.60 We would intend to implement our proposals on the recovery of network adjustments costs as follows:

- we would impose a specific pricing obligation on ancillary services related to making network adjustments which would, among other things, require that BT must not charge for these services unless the charges exceed the financial limit, in which case BT must only charge (as a maximum) the amount in excess of the financial limit;

²⁴⁷ Spine duct is measured in metres, and chambers are used in conjunction with spine duct. Although not typically measured in this way, the distance between feeder poles provides a consistent metric.

²⁴⁸ Replacing damaged distribution poles or providing additional capacity on distribution poles, or installing footway boxes outside properties where ducts for underground lead-ins are unusable to ensure telecoms providers can make use of any spine duct passing the property.

²⁴⁹ Distribution poles support multiple drop-wires and therefore serve a number of premises.

²⁵⁰ As set out in Section 4, our view is that Openreach should undertake network adjustments where required (be that replacing damaged distribution poles or providing additional capacity on distribution poles, or installing footway boxes outside properties where ducts for underground lead-ins are unusable to ensure telecoms providers can make use of any spine duct passing the property).

- we would include an allowance for a proportion of the costs of making network adjustments (appropriately capitalised²⁵¹) in the calculation of PIA rental charges; and
- we would include an allowance for a proportion of the costs of making network adjustments (appropriately capitalised) over all lines in the WLA charge control (i.e. allocated across WLR and MPF Rentals).²⁵²

7.61 We will set out detailed proposals in a further consultation.

Recovery of productisation costs

7.62 Openreach currently recovers costs incurred in setting up and managing the PIA product, and processing individual PIA orders through PIA rental charges. As explained above, a contribution to these costs – known as ‘productisation’ costs – is included in most PIA rental charges.²⁵³

7.63 In this sub-section, we set out our proposals for how productisation costs should be recovered in future. Productisation costs can be grouped into the following three categories:

- upfront costs: costs incurred by Openreach in setting up the PIA product (for example, process design and systems development costs);
- per order processing costs: costs incurred by Openreach when processing PIA orders; and
- sales, general and administration (SG&A) costs: ongoing administrative costs incurred by Openreach to support the PIA product.

7.64 In our consideration of upfront costs, we also include upfront costs which Openreach will need to incur in the future to further develop the PIA product given these costs are similar in nature (for example, systems development costs).

2016 PIA Consultation

7.65 Our initial view was that productisation costs should be recovered across all products which use the physical infrastructure, including PIA. Specifically:

- We considered that Openreach should recover the costs of developing infrastructure systems across all users of its physical infrastructure, consistent with the way Openreach recovers the costs of its own internal infrastructure records systems. We set out a number of benefits to this approach. Pooling and

²⁵¹ We understand that various costs related to network adjustments to support Openreach’s own network deployments (i.e. the costs of network planners related to the plan and design of build and enabling works, and the costs of undertaking build and enabling works) are typically capitalised. Openreach response to Question 49 of the section 135 Notice dated 6 March 2017.

²⁵² In order to consult on the WLA charge control, we included a relatively wide range of cost estimates to reflect the range of potential costs of the new PIA remedy. 2017 WLA MR Consultation, Annex 11, paragraphs A11.147 to A11.151. Although we are not setting a charge on services within the WFAEL market (i.e. WLR) these services have common assets with WLA services. We have therefore included WLR services in our charge control modelling in order to be able to determine appropriate common cost allocations.

https://www.ofcom.org.uk/_data/assets/pdf_file/0035/99638/Annexes1-19.pdf.

²⁵³ Rental charges for cable up a pole and pole top equipment do not include any productisation costs.

spreading these costs would eliminate any differential between the costs faced by BT and other telecoms providers and thereby ensure a level playing field. It would also provide a stronger incentive on Openreach to undertake the systems development in an efficient manner; and would reflect the wider benefits of network competition and our expectation that Openreach would use the same systems in future. In addition, we explained that recovering these costs from PIA users through rental charges would be highly likely to lead to over-recovery or under-recovery of those costs, given the current uncertainty around PIA take-up. For the same reasons, we considered that upfront costs already incurred by Openreach, but not yet recovered, should be recovered in the same way.

- In relation to costs of processing individual orders, we expected these costs to change due to our proposals in relation to planning and survey process, and associated systems. Given the uncertainty around PIA take-up, we considered that it may be more appropriate to recover these costs across all users of the physical infrastructure.
- We considered that the same approach should apply to the SG&A costs each year which Openreach currently includes in PIA rental charges.

Stakeholder responses to the 2016 PIA Consultation

7.66 Most stakeholders agreed with our proposed approach to the recovery of productisation costs (including future systems development costs). Only Openreach and Virgin Media disagreed with the approach, arguing that there was no justification for departing from recovering these costs directly from telecoms providers using PIA. Their arguments included that:

- the level of rental charges is not a barrier to investment;
- absent PIA, these costs would not be incurred;
- the extent to which other products and non-PIA telecoms providers benefit from the development of the system and planning tools for PIA is debateable;
- our approach could create the incentive for telecoms providers to request more systems development than necessary; and
- the risk of over-recovery or under-recovery is commonplace in Ofcom's price-setting.

Our Proposals

7.67 We remain of the view that productisation costs should be recovered across all SMP products that use the physical infrastructure (including PIA) – in the same way Openreach recovers similar costs related to its own use of the physical infrastructure. We explain the reasons for this below.

7.68 The productisation costs incurred to provide PIA are different to the equivalent costs faced by Openreach when it uses the physical infrastructure as an input to its own other products. Currently, when Openreach uses its physical infrastructure, it does not consume PIA; it follows different processes and uses different systems, with different associated costs. In addition, in some cases there is no functional equivalent of a PIA process when Openreach uses its physical infrastructure for its own

purposes.²⁵⁴ Although we are proposing to impose a no undue discrimination SMP condition on BT that will require strict equivalence in respect of all processes and sub-products that contribute to the supply and consumption of duct access (unless differences can be justified), it is likely that differences in cost will remain, at least in the short term.²⁵⁵

- 7.69 Differences between the costs faced by Openreach and the costs faced by other telecoms providers risk undermining the effectiveness of the remedy. This is because any disparity in cost has the potential to undermine confidence in the effectiveness of PIA as a basis on which to build competing networks at scale. This is particularly likely in this case given productisation costs currently make up a high proportion of overall rental charges (more than 50% in some cases).²⁵⁶ Therefore, we consider that it is important to ensure a level playing field with respect to these costs.
- 7.70 Openreach recovers the costs related to its own use of the physical infrastructure from all products using the physical infrastructure. We consider that productisation costs should be recovered in the same way. Pooling these costs (i.e. the productisation costs incurred to provide PIA and the equivalent costs faced by Openreach when it uses the physical infrastructure) and then spreading them across all SMP products that use the physical infrastructure would eliminate the differential between the costs faced by Openreach and other telecoms providers, and thereby ensure a level playing field.
- 7.71 We propose to apply this approach to all three categories of productisation costs (upfront costs, per order processing costs and SG&A costs).
- 7.72 This approach also provides Openreach with a stronger incentive to provide PIA efficiently, as the level of productisation costs incurred by Openreach has a direct effect on the profitability of the downstream products that Openreach itself makes available (as it needs to recover a proportion of these costs from these services). In contrast, under the current approach Openreach does not contribute to the recovery of productisation costs as it does not consume PIA. Thus, Openreach has little incentive to minimise these costs, particularly as increasing such costs could affect the viability of the business case of its competitors and reduce the likelihood that increased network competition emerges. Our approach therefore provides a spur to efficiency that does not currently exist. For example, Openreach will have an incentive to undertake systems developments at lower cost, or find ways of processing PIA orders as efficiently as possible. This will reduce the cost of using PIA and result in a more effective product, supporting competitive network investment.
- 7.73 We also observe that in some cases Openreach itself will benefit from PIA related costs, and other telecoms providers will benefit from costs incurred in relation to Openreach's own use of the infrastructure, providing further support for this

²⁵⁴ For example, when another telecoms provider wants to use BT's physical infrastructure, it must submit deployment plans (drawn up by its own network planner) to Openreach for approval by an Openreach network planner. In contrast, when Openreach wants to use the physical infrastructure, the deployment plans drawn up by an Openreach network planner do not need to be separately approved in the same way.

²⁵⁵ As explained in Section 5, we envisage that in order to comply with the non-discrimination requirement, new platforms and/or processes used by BT would not differ to those used by other telecoms providers, other than in the most exceptional circumstances.

²⁵⁶ This is a result of the low PIA volumes assumed in the current methodology used to calculate PIA rental charges. This also points to potential volatility in rental charges in the short run due to changes in volumes if these costs continue to be recovered exclusively from PIA rental charges.

approach. For example, we understand that some Openreach network planners are making use of the PIA Digital Map Tool designed for PIA users. Moreover, in its response to the 2016 PIA consultation, Openreach argued that PIA has benefitted from Openreach investment in its own mapping tools, which underpin the launch of the new PIA Digital Map Tool. Under our proposed approach, PIA users will contribute to the cost of past systems developments and Openreach will contribute to the cost of PIA systems.

Implementation

- 7.74 As explained above, we are proposing to set a cap on PIA rental charges using the current methodology as a starting point for our calculations. We would intend to implement our proposals on the recovery of productisation costs by removing the existing calculation of productisation costs in PIA rental charges and replace this with an allowance for a proportion of the productisation costs in the calculation of PIA rental charges.²⁵⁷ We would also include an allowance for a proportion of the productisation costs over all lines in the WLA charge control (i.e. allocated across WLR and MPF Rentals).²⁵⁸
- 7.75 We consider that the allowance for productisation costs should reflect the following elements:
- Upfront costs: we will include any upfront costs already incurred, but not yet recovered (including any costs incurred by Openreach in its more recent work to develop the PIA product).²⁵⁹ We will also include an allowance for costs which Openreach will need to incur in the future to develop the PIA product further (for example, systems development costs).
 - SG&A costs: we will review the SG&A costs to ensure these are appropriate.²⁶⁰
 - Per order processing costs: we will consider how these are likely to change due to our proposals in relation to the planning and survey processes, and associated systems.
- 7.76 We will set out detailed proposals in a further consultation.

²⁵⁷ We may also need to include an allowance in PIA rental charges for similar costs related to Openreach's own consumption of its ducts and poles, where this is not already the case.

²⁵⁸ In order to consult on the WLA charge control, we included a relatively wide range of cost estimates to reflect the range of potential costs of the new PIA remedy. 2017 WLA MR Consultation, Annex 11, paragraphs A11.147 to A11.151. Although we are not setting a charge on services within the WFAEL market (i.e. WLR) these services have common assets with WLA services. We have therefore included WLR services in our charge control modelling in order to be able to determine appropriate common cost allocations.

²⁵⁹ In its response to the 2016 PIA Consultation, Openreach argued that we dismissed the significant costs incurred to set up and operate the PIA service over the past five years, and that it has a reasonable and legitimate expectation that such costs can be recovered. However, our proposal (both now and in the 2016 PIA Consultation) is that any costs incurred but not yet recovered should still be included in the relevant cost stack.

²⁶⁰ In its response, Openreach explained that current SG&A costs in the PIA cost stack are not determined on a consistent basis with SG&A costs allocated to other products. Specifically, SG&A costs in the PIA cost stack reflect a number of FTE within the Customer, Commercial and Propositions team within Openreach, whereas elsewhere, the costs of this team are allocated to products based on a split of FTE's time. We will address this in a further consultation.

Adverse effects

- 7.77 We have considered whether our proposed approach to the recovery of network adjustment costs and productisation costs might give rise to adverse effects which are disproportionate compared to the aim of the proposals.
- 7.78 We have considered the following adverse effects:
- the impact on Openreach;
 - the impact on consumers; and
 - the risk of promoting inefficient investment.
- 7.79 As we explain below, we expect productisation costs to be much lower than network adjustment costs. Therefore, the impact on Openreach and consumers of our proposed approach to the recovery of productisation costs is likely to be much more limited than for network adjustment costs. As a result, much of the discussion below focuses on the recovery of network adjustment costs.
- 7.80 In general, the impact of our proposed approach to cost recovery on Openreach and consumers is likely to be limited within this market review period given the natural constraints on build rates associated with mass broadband deployments.²⁶¹ In the longer term, we recognise that the impact of our proposals is likely to be more significant. However, any requests for Openreach to relieve congested sections in its infrastructure will only arise where other telecoms providers are using PIA to deploy competing networks. Therefore, the scale of any impacts are contingent on the scale of network deployment, and so is directly linked to the scale of the benefits that result from imposing the PIA remedy. As a result, we consider that any adverse impacts are more likely to be justified by significant benefits to consumers in the longer term from greater network competition. In any event, we also have the flexibility to modify aspects of the PIA remedy in future, in light of evidence and experience.

Impact on Openreach

- 7.81 Openreach argued that our approach to network adjustment costs would transfer substantial risk associated with alternative network investment to Openreach, impacting on Openreach's overall financial position and ability to invest in its own access infrastructure projects.²⁶² Openreach also raised concerns about its ability to control the total costs imposed on Openreach and its other customers.²⁶³
- 7.82 We recognise that our proposed approach will require Openreach to recover additional costs of network adjustments over all products that use the physical infrastructure, including PIA users. We also acknowledge that there is risk associated with recovering these costs over an extended period of time due to possible changes in market circumstances, but we do not consider that this will have a significant adverse impact on Openreach for the reasons set out below.

²⁶¹ Information from stakeholders on the speed at which a new access network can be deployed in the first years of deployment suggests that up to 1 million homes could be passed by the end of this review period.

²⁶² Openreach response to the 2016 PIA Consultation, paragraph 19.

²⁶³ Openreach response to the 2016 PIA Consultation, paragraph 178.

- 7.83 The fact that the physical infrastructure is a shared asset supporting a range of products lowers the risk associated with investment required to undertake network adjustments. We expect Openreach to have a customer base over which to recover these costs for the foreseeable future. Even if Openreach loses significant volumes of customers on the Openreach network to competing networks built using PIA, Openreach will still be able to recover these costs from PIA users. Changes in market circumstances that do threaten cost recovery are likely to be more gradual, enabling us to take these into account when considering the most appropriate approach to cost recovery.²⁶⁴
- 7.84 Moreover, when regulating prices, we seek to ensure that Openreach has an opportunity to recover its efficiently incurred costs, including a return which reflects the associated risks of the investment. In this review period, we expect that the amount of cost, and therefore risk, transferred to Openreach will be relatively modest, given the natural constraints on build rates associated with mass broadband deployments. In future reviews, we will be able to ensure that Openreach is compensated for the level of risk associated with making network adjustments to support network deployment by another telecoms provider.²⁶⁵
- 7.85 In terms of the magnitude of the network adjustment costs that Openreach should be required to recover across all products using the physical infrastructure, we intend to set a financial limit on these costs. This will be based on estimates of the incidence and cost of the network adjustments required to make Openreach's physical infrastructure available for the purposes of deploying rival networks, informed by information held by Openreach. We will set out detailed proposals in a further consultation, but we do not expect our proposal to have a significant adverse impact on Openreach's financial position or its ability to invest in its own access infrastructure projects.²⁶⁶
- 7.86 In response to Openreach's concern about its ability to control its costs, we consider that our overall approach provides Openreach with control. As set out in Section 4, the requirement on Openreach to relieve congested infrastructure is limited to where this is necessary for its physical infrastructure network to be available to telecoms

²⁶⁴ For example, Openreach pointed to uncertainty about whether in 10 or 20 years' time NGA networks will continue to be based on existing fixed line technologies.

²⁶⁵ In its response to the 2016 PIA Consultation, Openreach referred to the risk Openreach would face if it was prevented from recovering significant upfront costs driven by another telecoms provider requesting substantial network enhancements with no obligation to pay and then entering liquidation. However, we note that telecoms providers could be required to commit to a minimum contract period before the works commence. Moreover, once a network is built, it seems unlikely that the assets will not continue to be utilised, and hence PIA rental charges will still be payable.

²⁶⁶ For example, based on its own FTTP business case cost modelling, Openreach estimates the cost of new duct and duct enabling works required for a deployment of FTTP to 40% of UK residential premises would be £[<]. There are a number of reasons why this figure is likely to overstate the additional cost of network adjustments (for example, although this does not include network adjustments related to non-duct infrastructure, it includes the cost of new duct where cables are directly buried which Openreach would not be required to provide under PIA). However, taking this figure at face value points to a cost of network adjustments of £[<] per home passed, and so up to £[<] over this review period (based on our estimate that up to 1 million homes could be passed by the end of this review period). This is relatively modest compared to the annual capital expenditure of Openreach as a whole, which was around £1.5 billion in 2015/16. Furthermore, BT Group reported free cash flow (after pension deficit repayments) of around £2 billion at the end of 2015/16, indicating that it could have financed additional investments had it chosen to. Source: Openreach response to 2016 PIA Consultation and <http://www.btplc.com/Sharesandperformance/Quarterlyresults/2015-2016/Q4/Downloads/KPIs/q416-KPIs.xlsx>.

providers for the purpose of deploying their own networks. We have provided guidance on where this obligation would apply and Openreach has the ability to refuse requests for network adjustments which are not necessary.²⁶⁷ Moreover, we are also proposing to set a financial limit on network adjustments providing Openreach with a degree of certainty about the level of costs it will need to recover across all products using the physical infrastructure.

7.87 In relation to productisation costs, we consider that the impact on Openreach is unlikely to be significant, given the overall magnitude of these costs is relatively small. For example:

- We estimate that productisation costs which have been incurred to date amount to less than £4 million.²⁶⁸
- Future systems development costs are estimated to be around £3 million.²⁶⁹

Impact on consumers

7.88 We recognise that an increase in the costs Openreach recovers over products which use its physical infrastructure could put upward pressure on prices, but believe that in this case such effects are likely to be outweighed by the significant benefits to consumers in the longer term from innovation (including innovation to increase efficiency and lower costs), choice, stronger incentives to price keenly to attract customers and higher quality of service (as explained in Section 3).

7.89 As explained above, we will set out in a further consultation detailed proposals in relation to a financial limit on the network adjustment costs that Openreach should be required to recover across all products using the physical infrastructure. We expect the impact on consumers from higher prices to be relatively modest in this review period. In particular, as any costs incurred will be recovered over a relatively long time period, the impact on individual prices will be very small in this review period.

7.90 In the longer term, we recognise that the impact of our proposals on consumers could be more significant. However, any requests for Openreach to relieve congested sections in its infrastructure will only arise where other telecoms providers are using PIA to deploy competing networks. Therefore, the scale of any impact is contingent on the scale of network deployment, and so is directly linked to the scale of the benefits that result from imposing the PIA remedy. As a result, we consider that any adverse impacts are more likely to be justified by significant benefits to consumers in the longer term.

7.91 We also recognise that while an effective PIA remedy could make downstream services potentially competitive in many geographic areas, in other areas it may become apparent that the prospects for rival investment are limited.²⁷⁰ As a result, a greater degree of differentiation in our regulatory approach across the UK may emerge in time, with different remedies needed in different geographic areas. We will

²⁶⁷ Where Openreach refuses a request for network access, Openreach must provide reasons for doing so.

²⁶⁸ Openreach was unable to provide us with complete information on productisation costs incurred to date. We have estimated this figure based on what information it could provide. Openreach response to Question 1 of the section 135 Notice dated 27 January 2017.

²⁶⁹ Mott MacDonald, April 2017. *DPA Solution System Requirements Specification*.

²⁷⁰ The economics of deployment vary by geography, for example, because of differences in the costs of deployment.

be able to consider the most appropriate approach to the recovery of costs taking into account market circumstances.

Risk of promoting inefficient investment

Inefficient build/buy decisions

- 7.92 Both Openreach and Virgin Media argued that our proposed approach to network adjustment costs would promote inefficient entry, as telecoms providers would not bear the full costs of the infrastructure adjustments required to enable them to deploy their networks. Specifically, Openreach argued that PIA should be provided on terms that reflect the economic costs of providing such access, including the costs of making repairs and adjustments to BT's network in so that it is ready-to-use, such that telecoms providers make efficient build/buy decisions.²⁷¹ Therefore, telecoms providers should face the full costs of any network adjustments they require to ensure that telecoms providers will invest only where it is efficient to do so.
- 7.93 These arguments focus on the productive efficiency of telecoms operators' choices of whether to build a rival network or continue to rely on wholesale access to Openreach's network (specifically, VULA and LLU). However, this is not our sole objective. We are requiring BT to provide access to its physical infrastructure with the aim of promoting competition and investment in rival networks, and our proposed approach to the recovery of network adjustment costs supports this objective. As explained in Section 3, we consider that there are significant benefits to consumers from competition based on rivals investing in their own networks, compared to competition based on regulated access to BT's network and services.²⁷²
- 7.94 In any event, we do not agree that our proposed approach encourages inefficient build/buy decisions relative to BT's alternative approach of charging telecoms providers for network adjustments. Although setting prices on the basis of incremental costs can in some cases provide efficient signals for investment, there are a number of reasons in principle and in practice why we do not believe this to be the case in relation to network adjustment costs.
- 7.95 As explained in paragraph 7.50, it is likely difficult in practice to identify the genuine incremental costs of making the network ready for use, and BT's incentives are poorly aligned with ensuring that the relevant costs are reliably estimated and efficiently incurred.
- 7.96 Moreover, as explained in paragraphs 7.45 and 7.50, the current approach where a telecoms provider pays the full cost incurred in undertaking any network adjustments could deter efficient investment, as it does not reflect the benefits to BT and other telecoms providers, now and in the future. As a result, there may be some cases where competitive network investment will not take place under the current approach, which BT proposes should continue, because the telecoms provider does not value the required network adjustment enough to pay the full cost, but all parties that benefit (now and in the future) would be prepared to share the cost if faced with that decision. Therefore, sharing the cost of network adjustments can unlock competitive network investment that would not take place under the current approach. Similarly,

²⁷¹ Openreach response to the 2016 PIA Consultation, paragraph 11.

²⁷² As explained in Section 3, allowing telecoms providers to respond to the prospect of BT's chosen strategy of investment by themselves investing in competing networks will help ensure that the investment decisions serve the needs of customers.

under the current approach, the telecoms provider would be charged the full cost of any repairs required, which could deter investment if the telecoms provider does not value the repair sufficiently. Under our proposed approach, the telecoms provider would only make a contribution to the cost of the repair.²⁷³

Inefficient network adjustments

- 7.97 Openreach also argued that our proposed approach would encourage telecoms providers to request inefficient adjustments to the network, as they would not bear the costs of doing so.²⁷⁴ We
- 7.98 recognise that there is a risk that telecoms providers may have a weaker incentive to minimise requests for network adjustments than under the current approach. However, we do not consider this to be a significant risk for the following reasons.
- 7.99 The ability for telecoms providers to request inefficient adjustments is limited as Openreach would only be required to recover the costs of necessary adjustments and would be able to refuse requests for adjustments which are not necessary. Openreach would also be able to suggest alternative routings and if more efficient alternative routings were available, adjustments would not be considered necessary. In addition, Openreach has the flexibility to choose the most efficient means of relieving congested infrastructure.²⁷⁵ Moreover, telecoms providers would bear the costs of any network adjustments above the financial limit, providing them with an incentive to minimise these costs so as not to exceed the limit.
- 7.100 In addition, under our proposed approach, Openreach has a greater incentive to choose the most efficient approach to undertaking each network adjustment, compared to the current approach where all costs are passed on to the telecoms provider requesting the adjustment.

Productisation costs

- 7.101 We have also considered whether our proposed approach to recovering productisation costs promotes inefficient investment. Openreach argued that departing from the principle of cost causation for the recovery of per order costs will promote inefficient and unsustainable market entry, and provides poor incentives on telecoms providers to put in orders in a way which minimises the processing cost.²⁷⁶ We disagree for the following reasons:
- 7.102 We have also considered whether our proposed approach to recovering productisation costs promotes inefficient investment. Openreach argued that departing from the principle of cost causation for the recovery of per order costs will

²⁷³ Openreach argued that some network adjustments would be unlikely to add value to other users of the infrastructure as it considered further FTTP rollout unlikely, and observed that repairs to collapsed ducts may not be necessary to maintain its existing services. However, given the long asset lives of BT's physical infrastructure, many of these repairs would be eventually be required in any case, and we consider that many network adjustments are likely to benefit current and/or future users of the infrastructure.

²⁷⁴ Openreach response to the 2016 PIA Consultation, paragraph 180.

²⁷⁵ We also consider that our proposed approach to cost recovery also promotes productive efficiency, as Openreach has a greater incentive to choose the most efficient approach to undertaking each network adjustment, compared to the current approach where all the costs are passed on to the telecoms provider requesting the adjustment (as discussed in paragraph 7.100).

²⁷⁶ Openreach response to the 2016 PIA Consultation, paragraph 304.

promote inefficient and unsustainable market entry, and provides poor incentives on telecoms providers to put in orders in a way which minimises the processing cost. We disagree for the following reasons:

- These costs are small compared to the total costs of deploying a network, so we do not expect the absolute level that is recovered from PIA users (versus all products using the infrastructure) to have a material impact on the build/buy decision.
- As to the incentives on telecoms providers to put in orders in a way which minimises the processing cost, we consider that telecoms providers will still have an incentive to put in orders in an efficient way under our proposals as they incur their own administrative costs associated with submitting orders.²⁷⁷ Moreover, in our view, Openreach has significant control over how orders should be placed and processed, and our approach of pooling and spreading the costs of processing orders creates a spur for Openreach to design efficient processes.

7.103 Openreach also argued that our proposed approach to systems development costs would incentivise telecoms providers to request greater levels of systems development than may be necessary, without any cost impact on their product pricing and business case.²⁷⁸ However, Openreach retains a significant degree of control over systems development costs, as it decides how the systems development is undertaken, and so our proposal incentivises Openreach to undertake these developments efficiently.

Consultation questions

Question 7.1: Do you agree with our proposed form of price regulation for PIA rental and ancillary charges? Please provide reasons and evidence in support of your views.

Question 7.2: Do you agree with our proposed approach to the recovery of network adjustment costs? Please provide reasons and evidence in support of your views.

Question 7.3: Do you agree with our proposed approach to the recovery of productisation costs? Please provide reasons and evidence in support of your views.

²⁷⁷ We note that even under the current approach to recovering these costs, per order costs are averaged across all PIA users (based on volume forecasts), and not directly from the telecoms provider which places the order.

²⁷⁸ Openreach response to the 2016 PIA Consultation, paragraph 154.

Annex 1

Responding to this consultation

How to respond

- A1.1 Ofcom would like to receive views and comments on the issues raised in this document, **by 5pm on 15 June 2017**.
- A1.2 We strongly prefer to receive responses via the online form at <https://www.ofcom.org.uk/consultations-and-statements/category-2/duct-pole-access-remedies>. We also provide a cover sheet (<https://www.ofcom.org.uk/consultations-and-statements/consultation-response-coversheet>) for responses sent by email or post; please fill this in, as it helps us to maintain your confidentiality, and speeds up our work. You do not need to do this if you respond using the online form.
- A1.3 If your response is a large file, or has supporting charts, tables or other data, please email it to piaremedy@ofcom.org.uk, as an attachment in Microsoft Word format, together with the cover sheet (<https://www.ofcom.org.uk/consultations-and-statements/consultation-response-coversheet>).
- A1.4 Responses may alternatively be posted to the address below, marked with the title of the consultation.
- Shaun Tey
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA
- A1.5 If you would like to submit your response in an alternative format (e.g. a video or audio file), please contact Shaun Tey on 020 7981 3000, or email piaremedy@ofcom.org.uk.
- A1.6 We do not need a paper copy of your response as well as an electronic version. We will acknowledge receipt if your response is submitted via the online web form, but not otherwise.
- A1.7 You do not have to answer all the questions in the consultation if you do not have a view; a short response on just one point is fine. We also welcome joint responses.
- A1.8 It would be helpful if your response could include direct answers to the questions asked in the consultation document. The questions are listed at Annex 4. It would also help if you could explain why you hold your views, and what you think the effect of Ofcom's proposals would be.
- A1.9 If you want to discuss the issues and questions raised in this consultation, please contact Shaun Tey on 020 7981 3000, or by email to Shaun.Tey@ofcom.org.uk.

Confidentiality

- A1.10 Consultations are more effective if we publish the responses before the consultation period closes. In particular, this can help people and organisations with limited

resources or familiarity with the issues to respond in a more informed way. So, in the interests of transparency and good regulatory practice, and because we believe it is important that everyone who is interested in an issue can see other respondents' views, we usually publish all responses on our website, www.ofcom.org.uk, as soon as we receive them.

- A1.11 If you think your response should be kept confidential, please specify which part(s) this applies to, and explain why. Please send any confidential sections as a separate annex. If you want your name, address, other contact details or job title to remain confidential, please provide them only in the cover sheet, so that we don't have to edit your response.
- A1.12 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and try to respect it. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A1.13 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's intellectual property rights are explained further at <https://www.ofcom.org.uk/about-ofcom/website/terms-of-use>

Next steps

- A1.14 Following this consultation period, Ofcom plans to publish a further consultation in summer 2017.
- A1.15 If you wish, you can register to receive mail updates alerting you to new Ofcom publications; for more details, please see <https://www.ofcom.org.uk/about-ofcom/latest/email-updates>

Ofcom's consultation processes

- A1.16 Ofcom aims to make responding to a consultation as easy as possible. For more information, please see our consultation principles in Annex 2.
- A1.17 If you have any comments or suggestions on how we manage our consultations, please call our consultation helpdesk on 020 7981 3003 or email us at consult@ofcom.org.uk. We particularly welcome ideas on how Ofcom could more effectively seek the views of groups or individuals, such as small businesses and residential consumers, who are less likely to give their opinions through a formal consultation.
- A1.18 If you would like to discuss these issues, or Ofcom's consultation processes more generally, please contact Steve Gettings, Ofcom's consultation champion:

Steve Gettings
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Email corporation.secretary@ofcom.org.uk

Annex 2

Ofcom's consultation principles

Ofcom has seven principles that it follows for every public written consultation:

Before the consultation

- A2.1 Wherever possible, we will hold informal talks with people and organisations before announcing a big consultation, to find out whether we are thinking along the right lines. If we do not have enough time to do this, we will hold an open meeting to explain our proposals, shortly after announcing the consultation.

During the consultation

- A2.2 We will be clear about whom we are consulting, why, on what questions and for how long.
- A2.3 We will make the consultation document as short and simple as possible, with a summary of no more than two pages. We will try to make it as easy as possible for people to give us a written response. If the consultation is complicated, we may provide a short Plain English / Cymraeg Clir guide, to help smaller organisations or individuals who would not otherwise be able to spare the time to share their views.
- A2.4 We will consult for up to ten weeks, depending on the potential impact of our proposals.
- A2.5 A person within Ofcom will be in charge of making sure we follow our own guidelines and aim to reach the largest possible number of people and organisations who may be interested in the outcome of our decisions. Ofcom's Consultation Champion is the main person to contact if you have views on the way we run our consultations.
- A2.6 If we are not able to follow any of these seven principles, we will explain why.

After the consultation

- A2.7 We think it is important that everyone who is interested in an issue can see other people's views, so we usually publish all the responses on our website as soon as we receive them. After the consultation we will make our decisions and publish a statement explaining what we are going to do, and why, showing how respondents' views helped to shape these decisions.

Annex 3

Consultation response cover sheet

- A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.
- A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email or post you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at <http://stakeholders.ofcom.org.uk/consultations/consultation-response-coversheet/>.
- A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing

Name/contact details/job title

Whole response

Organisation

Part of the response

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

Name

Signed (if hard copy)

Annex 4

Consultation questions

Question 4.1: Do you agree with our proposals for a specific access obligation, which includes an obligation on BT to make adjustments to its physical infrastructure when its network is congested? Please provide reasons and evidence in support of your views.

Question 4.2: Do you agree with our proposals on the scope of PIA: (1) To broaden usage through a mixed usage generic rule; (2) To modify the PIA condition to define geographic scope by reference to telecoms providers' local access networks. Please provide reasons and evidence in support of your views.

Question 5.1: Do you agree with our proposed imposition of a no undue discrimination SMP condition on BT? Please provide reasons and evidence in support of your views.

Question 6.1: Do you agree with our proposed approach to the processes and systems relating to planning and surveying? Please provide reasons and evidence in support of your views.

Question 6.2: Do you agree with our proposed approach to the processes for build works and enabling works? Please provide reasons and evidence in support of your views.

Question 6.3: Do you agree with our proposed approach to processes relating to the connecting the customer stage? Please provide reasons and evidence in support of your views.

Question 7.1: Do you agree with our proposed form of price regulation for PIA rental and ancillary charges? Please provide reasons and evidence in support of your views.

Question 7.2: Do you agree with our proposed approach to the recovery of network adjustment costs? Please provide reasons and evidence in support of your views.

Question 7.3: Do you agree with our proposed approach to the recovery of productisation costs? Please provide reasons and evidence in support of your views.

Annex 5

Risk to BT's cost recovery from relaxing usage restrictions

- A5.1 This annex analyses potential adverse effects of relaxing usage restrictions of the PIA remedy on BT's ability to recover costs from regulated services in the business connectivity markets. In doing so, we consider the extent to which our proposed policy option (a generic mixed usage rule) is likely to mitigate impacts in such markets.
- A5.2 Relaxing usage restrictions would allow telecoms providers to use PIA for business connectivity services in certain circumstances. This may have the effect of increasing the competitive pressure on some of Openreach's wholesale active products. As a consequence, Openreach might see a reduction in its leased lines volumes which could affect BT's ability to recover its cost from regulated products.
- A5.3 In the 2016 PIA Consultation, we illustrated the potential cost recovery implications by identifying the regulated services which may come under greater competitive pressure, and the costs associated with these services that might theoretically be at risk. We also explained that whether usage restrictions were removed completely or only partially (i.e. mixed usage) is likely to have some bearing on the proportion of volumes that are lost and therefore the actual impact on BT's cost recovery.
- A5.4 Several stakeholders commented on our methodology to illustrate possible impacts. A number of stakeholders thought that we were overestimating the cost recovery at risk and observed that BT has consistently over-recovered costs in recent years. Conversely, Openreach said that we were not truly reflecting the risks to Openreach's cost recovery, and made detail comments on our assumptions.
- A5.5 We have updated our illustrative figures to reflect the cost recovery impact of our proposed policy option (a generic mixed used rule) and take account of stakeholders' comments. In what follows, we consider the following issues:
- the regulated services which could come under increased competitive pressure due to relaxing usage restrictions in the local access area;
 - the extent to which a mixed usage rule would limit telecoms providers' ability to target customers of business connectivity services, including density considerations; and
 - market shares/take-up of PIA-based competitors.

Relevant services at risk and their costs

- A5.6 In the 2016 PIA Consultation, we sought to identify the regulated services which we thought may come under greater competitive pressure as a result of relaxing usage restrictions, and the unavoidable costs associated with these services that might theoretically be at risk based on BT's volumes and costs in 2014/15.²⁷⁹ We

²⁷⁹ In estimating the pool of cost that could be potentially at risk, we relied on BT's Regulatory Financial Statements (RFS) 2014/15, containing data on regulated services in the business

considered an extreme case, in which all regulated leased line services identified as being at risk are replaced by leased lines supplied by telecoms providers using PIA. The steps in our approach were as follows:

- BT's fully allocated costs (FAC) of regulated services in the business connectivity markets totalled £917m in 2014/15.²⁸⁰
- We assumed that Traditional Interface (TI) circuits would be unlikely to become under greater competitive pressure if we were to relax usage restrictions. This assumption was based on the conclusions in past BCMRs including the 2016 review, that newer generation services were not a substitute for these legacy services.²⁸¹ This left the FAC of Multiple Interface (MI) and Alternative Interface (AI) services.²⁸²
- We explained that not all of the FAC attributed to these MI and AI services would be at risk since the FAC includes certain costs that could be avoided in the event that Openreach loses a leased line to a telecoms provider using PIA. For the purpose of this exercise, we excluded the FAC of active equipment.²⁸³ We divided the remaining costs into costs that are common across markets, which are likely to be unavoidable, and other allocated costs, which most likely comprise a mix of avoidable and unavoidable costs. Common costs were calculated as FAC – minus DLRIC. Other allocated costs were calculated as DLRIC minus the FAC of Ethernet electronics. We said that we expect the relevant set of costs at risk include the common costs but only a proportion of the other allocated costs.
- We excluded the cost corresponding to services which are used to provide fixed backhaul connections. This is because telecoms providers would not be allowed to use PIA to build fixed backhaul connections given our initial view that any changes to usage restrictions should remain bounded by the existing wholesale local access area (i.e. between a network termination point and a local access node). Therefore, we excluded the costs associated with pure backhaul services (Ethernet Backhaul Direct, Backhaul Extension Services and Main Links), as well

connectivity markets, and their fully allocated costs. We supplemented RFS information with additional information which BT regularly reports to Ofcom (AFI-C3). We identified the set of services that would be at risk, and the costs that could be avoidable to arrive at our illustrative figures. Given that the analysis was based on 2014/2015 data, we took into account the regulatory framework in force at that moment (as per 2013 BCMR Statement).

²⁸⁰ The estimation is based on the FAC attributed to services in BT's Regulatory Financial Statements. It therefore excludes support services (e.g. excess construction charges).

²⁸¹ TI services are valued for their high quality service characteristics, but the majority are low bandwidth (2Mbit/s and below) and low cost relative to other leased lines. Given the declining trend in TI services and relatively low price, we assumed that rivals to BT will not enter the market to provide low bandwidth TI services using PIA.

²⁸² The MI and AI markets defined in BCMR 2013 were replaced by the market for Contemporary Interface Symmetric Broadband Origination Services (CISBO) in BCMR 2016. See footnote 116 of BCMR 2016.

²⁸³ We used information of Ethernet electronics in tables 8.7.2, 8.8.2 and 8.9.2 of BT's 2014/2015 RFS to obtain total FAC corresponding to electronics of the AI and MI regulated services (£177m).

as a proportion²⁸⁴ of the costs associated with other leased lines services reflecting the extent to which they are used for backhaul purposes.²⁸⁵

A5.7 We estimated that the costs corresponding to the pool of services that might in theory be at risk if PIA was used to replace all leased lines in the categories described above would range between £174m (common costs) and £243m (common costs and other allocated costs) per year.

A5.8 Openreach challenged a number of our assumptions and presented illustrative figures based on alternative assumptions.²⁸⁶

- Openreach argued that telecoms providers using PIA would target TI users as well, which would accelerate migration from TI to AI circuits, and assumed that 50% of these lines would be at risk.
- Openreach disagreed with the way we computed common costs and argued that electronic equipment costs were not fully avoidable. In particular, Openreach argued that unless restrictions are in place to limit customers switching before the asset life of the equipment has expired, these costs would still be at risk. Openreach assumed that only 50% of electronic equipment FAC should be treated as avoidable. In addition, given that DLRIC is a measure of long run incremental cost which does not factor in short term issues, Openreach proposed to consider 20% of DLRIC as common costs (rather than “other allocated costs”). Openreach also argued that LRIC may be an alternative measure of incremental costs, rather than DLRIC.²⁸⁷
- Openreach disagreed that Main Links would not be used in the Wholesale Local Access Area, and assumed 50% of the costs of those services would be at risk.

A5.9 Based on these assumptions, Openreach presented revised illustrative figures, which estimated the pool of cost at risk in the range of £[<]m and £[<]m per year.²⁸⁸

²⁸⁴ We used a database that Ofcom built as a part of the BCMR 2016 review to identify the percentage of Openreach’s services which are used for connectivity between network nodes. The database is based on an inventory of all Openreach’s leased lines and network sites from all telecom providers collected during the BCMR 2016 consultation process through various information requests. The database specifies, for each circuit end, whether it is connecting a customer or a network site. We used this data to obtain the percentage of circuits which were connecting two network sites (*i.e.* without a customer end) for each of the services specified above. Specifically: 7% of 10/100 Mbit/s AI lines, 18% of EAD LA 1Gbit/s, 38% of EAD other 1Gbit/s, 19% of WES 1Gbit/s, 45% of WDM services and 40% of WES above 1Gbit/s were excluded.

²⁸⁵ Openreach requested further clarification as to how we calculated the costs to associated with backhaul services (£248m). The FAC of these services was £288m. However, as the costs associated with Ethernet electronics for these services had already been subtracted in the previous step, we added this back based on the per service figures available in BT’s 2014/2015 RFS, to avoid subtracting the same costs twice.

²⁸⁶ “Our illustration highlights that by correcting the four assumptions within the Ofcom analysis, the estimated cost recovery at risk could increase by [<]. This demonstrates the sensitivity of these parameters and that systematic understatement could radically underestimate the cost recovery risks to Openreach and its wider customer base.” See Openreach response to the 2016 PIA Consultation, Annex C, paragraph 350.

²⁸⁷ Openreach’s response, paragraphs 344 and 346.

²⁸⁸ Openreach said that there were further assumptions which must also be reviewed to provide a more representative picture of risk. Openreach provided just one example relating to the cost of

A5.10 We recognise that our estimates were illustrative and acknowledge that there is uncertainty around the impact on use of PIA to replace leased lines and the knock-on impact on Openreach cost recovery. However, since these are illustrative estimates of the pool of costs associated with services at risk in the extreme case where PIA is used to replace leased lines across the UK as a whole (which is highly unlikely, especially given our proposal to adopt the mixed-use approach) we do not think it necessary to produce precise estimates. For completeness, we note that some of the alternative set of assumptions in Openreach’s sensitivity seem to us to be particularly questionable. For example, we do not accept that 50% of TI circuits would be at risk. Customers already have the option of substituting TI circuits for other services (including those offered by Openreach), such as Ethernet or broadband products. Although it is possible that having additional options based on use of PIA could influence migration rates, we would expect any impact to be small.²⁸⁹ Moreover, even if migration rates were to increase slightly, some of these customers could migrate to FTTP connections. Such migration would be possible under the pre-existing usage restrictions.

A5.11 In our subsequent analysis, we do refer to the estimates of the pool of costs at risk, both those in the 2016 PIA Consultation, and Openreach’s assumptions as a sensitivity. While these are illustrative, we think they are reasonable high level indications for the purposes used below.²⁹⁰ Figure A5.1 summarises both figures.²⁹¹

Figure A5.1 Illustrative figures of pool of costs at risks based on RFS 2014/2015

	Ofcom’s pool of costs at risk	Openreach’s pool of costs at risk
Common Costs	£174m	£[X]
Other allocated costs	£69m	£[X]

Proportion of non-residential premises within network footprint

A5.12 Under a mixed usage rule, telecoms providers would only be able to use the PIA remedy to provide leased lines in the context of a network deployment primarily used to provide mass broadband services. This will limit substantially the extent to which telecoms providers using PIA would be able to target leased lines customers,

regulated services – the possibility that telecoms providers would target high density, high value areas with minimal investment, and putting a disproportionate amount of fixed and common cost recover at risk. We address this below.

²⁸⁹ In the 2016 BCMR Statement, we concluded that the rate of migration from TI to Ethernet services was unlikely to be strongly influenced by movements in relative prices. See paragraph 5.35 of 2016 BCMR Statement, Volume 1.

²⁹⁰ For the avoidance of doubt, this does not imply that we accept the assumptions used by Openreach. Instead, we present this sensitivity to show that our conclusions in Section 4 hold even under these alternative assumptions.

²⁹¹ Ofcom’s estimates, when updated with 2015/2016 RFS and AFI-C3 data do not change significantly. Common costs are £185m and other allocated costs are £66m per year. We also checked how results would change when using LRIC rather than DLRIC. Openreach provided LRIC information per regulated as a response to our S135 request dated February 20, 2017. However, there is no significant different between the LRIC and the DLRIC of the services under consideration (DLRIC and LRIC differ more in the case of backhaul services). For 2015/2016, the difference is around £1m in total.

especially in the short term. This is because the natural constraints on build rates associated with mass broadband deployments mean that only a small percentage of leased lines would be within network reach in the short term.

- A5.13 We have used the geographic overlap analysis described in Section 4, which maps residential and non-residential delivery points to Openreach’s copper exchanges, to illustrate what proportion of non-residential premises could be covered by PIA-based competitors over this review period.²⁹²
- A5.14 Information from stakeholders on the speed at which a new access network can be deployed in the first years of deployment suggests that up to 1 million homes could be passed by the end of this review period.²⁹³
- A5.15 Openreach argued telecoms providers could substitute a disproportionately large number of leased lines by targeting a limited number of high density areas.²⁹⁴ For the purposes of this illustration, we have sought to reflect this possibility by assuming that networks using PIA would target areas with a higher concentration of leased lines. Therefore, we assume that telecoms providers will serve exchange areas with the highest percentage of non-residential premises first.^{295 296}
- A5.16 Figure A5.2 shows the result of our illustrative analysis. By targeting areas with greater density of non-residential premises first, telecoms providers would be able to reach 2.4% of the non-residential premises in the first year, despite only passing 0.2% of homes. As the geographic reach of PIA based networks increases in the longer term telecoms providers exhaust those areas with the highest concentration of non-residential premises and proportions of non-residential and residential premises within network reach become more balanced.

Figure A5.2 Percentage of non-residential premises covered

	% of residential premises passed	% of non-residential premises passed
Year 1	0.2%	2.4%
Year 2	0.7%	4.7%
Year 3	3.7%	11.5%
Medium term	10.0%	22.0%
Long term	40.0%	57.4%

²⁹² See paragraph 4.67.

²⁹³ In addition, we would expect most of the growth in coverage to take place towards the end of the review period. We assume that 50,000 homes could be passed by the end of the first year, and 200,000 homes could be passed by the end of the second year.

²⁹⁴ Openreach raised this point in paragraph 352 of its response to the 2016 PIA Consultation.

²⁹⁵ We sort exchanges by decreasing proportion of non-residential delivery points and assume that telecoms providers will meet the forecasts of residential premises by targeting areas with high proportion of non-residential delivery points. We obtained the proportion of non-residential delivery points per exchange as: non-residential delivery points divided by total delivery points. We exclude PO boxes from the calculations. We include exchange areas which exclusively or primarily serve businesses. In practice, telecoms providers would not be able to serve such areas in isolation under a mixed usage rule. See section 4 describing how our proposals would work in practice.

²⁹⁶ We assume it is in the interest of telecoms providers to serve sparsely distributed areas with high density of non-residential premises. In practice, telecoms providers under a mixed usage rule may rather target urban areas with lower proportion of non-residential premises.

Source: Ofcom's Analysis based on Openreach's information of postcodes served by each copper exchange and Ordinance Survey's Code-Point database.

Impact on cost recovery in this review period

- A5.17 We apply the percentage of non-residential premises covered to the total pool of costs to provide a high level indication of the extent of costs at risk under mixed usage.²⁹⁷ So, for example, if 5% of the non-residential premises are covered by a PIA-based competitor, we assume that 5% of the pool of costs would be at risk at most.²⁹⁸
- A5.18 It is unlikely that all leased lines within an area where a mixed-use network was rolled out would be switched to PIA-based alternatives. Therefore, we would only expect Openreach to lose a proportion of the services that we have identified to be at risk. As in our 2016 PIA Consultation, for the purposes of this illustrative analysis, we assume that BT would lose a third of the lines within the PIA-based competitors' footprint. We note that Three argued this was an unrealistically aggressive assumption for the short term, given switching costs.²⁹⁹
- A5.19 We present short term figures below. These are based on the upper bound of costs that we identified in the 2016 PIA Consultation (£243m per year), and the alternative figure presented by Openreach (£[X] per year).

Figure A5.3 Illustrative cost at risk

	% of Business Passed	Based on Ofcom pool of cost at risk	Based on Openreach pool of cost at risk
Year 1	2.4%	£2m	£[X]
Year 2	4.7%	£4m	£[X]
Year 3	11.5%	£9m	£[X]

- A5.20 These illustrative figures suggest that, on average, the cost at risk will be less than £5m per year according to our figure for the pool of cost at risk, and less than £[X]m per year when considering Openreach's alternative figure.³⁰⁰
- A5.21 As noted, these estimates are indicative and do not take into account other factors that could affect Openreach's cost recovery, some of which might point to a smaller impact and others to a larger impact:³⁰¹

5.21.1 the figures do not take into account the fact that the purchase of the PIA product would provide some degree of compensation for the common costs associated with the leased lines that are assumed to be displaced, hence

²⁹⁷ For the purpose of this illustrative exercise, we take the conservative assumption that all costs falling in the category of "other allocated costs" would not be avoided.

²⁹⁸ We note that this methodology does not imply that costs are similar across geographies, but rather that a similar amount of cost would be recovered by each leased line of a given bandwidth. We also note that our illustration of network reach incorporates differences in density.

²⁹⁹ See Three's Response to the 2016 PIA Consultation, paragraph 2.18. In addition, in the 2016 BCMR Statement, we said there are likely to be some barriers to switching suppliers. See paragraphs 4.495-4.496 of 2016 BCMR Statement.

³⁰⁰ We have looked at how our estimate of the cost at risk would change if we considered LRIC as a measure of avoidable costs. In this case, the average cost shortfall would reduce to £3.5m per year.

³⁰¹ See also the other points noted at paragraph A.5.8.

the expected impact on Openreach cost recovery will be less than the amounts indicated;

5.21.2 the figures above do not take into account migration trends, and thus the relevant set of lines at risk might be different than the ones identified in the analysis. The above analysis uses BT's costs based on its installed base of leased lines circuits in 2014/15, so it will not reflect these changes; and

5.21.3 the analysis does not consider the extent to which incentives to build/buy leased lines based on expected pricing trends of leased lines or the introduction of the dark fibre remedy would limit the share of connections at risk.³⁰²

A5.22 However, we consider that these figures give a reasonable high level indication of the order of magnitude of impact that can be expected under our proposed mixed-use approach to relaxing the usage restriction.

Impact on cost recovery in the longer term

A5.23 In the long term, the percentage of leased lines that might be replaced with PIA-based products is likely to be greater, as it is possible that telecoms providers using PIA could reach a large proportion of Openreach's current customers.

A5.24 Impacts in the longer term are subject to greater uncertainty. However, for the purposes of illustration, we have applied the same methodology above assuming BT were to lose a third of its leased lines customers in the medium term (10% of residential coverage) and the long term (40% of residential coverage).³⁰³ However, in these scenarios we assume only common cost is at risk. This is because long run incremental costs are likely to be avoidable in the long run. Figure A5.4 below illustrates the extent of possible cost recovery impacts. This shows that the cost at risk would be £33m per year for a PIA-based network deployment reaching 40% of residential premises, according to our figure for the pool of cost at risk, and £[X]m per year using Openreach's alternative figure.

Figure A5.4 Illustrative cost at risk in the long term

	% of Business Passed	Based on Ofcom pool of cost at risk	Based on Openreach pool of cost at risk
Medium Term	22%	£13m	£[X]m
Long Term	57%	£33m	£[X]m

³⁰² As explained above, our analysis is based on 2014/2015 data, and therefore takes into account the regulatory framework in force at that moment (as per 2013 BCMR Statement). In the 2016 BCMR Statement, we introduced a dark fibre remedy and, as a result, the mix of products purchased by leased lines customers is likely to change in future. However, we would not expect this change to affect our conclusions in Section 4.

³⁰³ In the 2016 PIA Consultation, we provided an example explaining that if 10% of the residential premises were covered, less than 25% of non-residential premises would be within network reach. This corresponds to our "medium term" scenario.

Annex 6

Summary of stakeholder responses

Introduction

A6.1 28 stakeholders provided written responses to the 2016 PIA Consultation. We have published non-confidential versions of the responses on our website.³⁰⁴ In this annex, we provide a summary of the main points raised by stakeholders. In this annex, we cover the following topics in turn:

- Physical infrastructure access remedy
 - Adjustments to infrastructure
 - Scope of PIA
- Non-discrimination requirements
- Improvements to PIA process and systems
- Price regulation of PIA
- Cost recovery of infrastructure adjustments and systems development

Physical infrastructure access remedy

Adjustments to infrastructure

Summary

A6.2 All stakeholders agreed with the principle that Openreach should be required to make some adjustments to the physical infrastructure to facilitate access and ensure the remedy is effective. Most stakeholders agreed that if Openreach is not required to make adjustments to the network to relieve congested physical infrastructure, then network deployments will potentially become inefficient and costly, undermining the viability of the deployment. However, Openreach stated that short stretches of congested duct cannot be obstacles to a scale deployment of an ultrafast network because they happen infrequently.³⁰⁵

A6.3 There were a range of views as to the extent of the adjustments Openreach should be required to make. Most stakeholders thought that Openreach should be required to repair existing faulty infrastructure and some stakeholders thought that its obligations should extend to include the construction of new infrastructure in areas that Openreach already serves. Most stakeholders agreed that it should not include the provision of infrastructure to areas unserved by Openreach. Openreach argued that any extension of the PIA obligation which moves beyond unbundling of an

³⁰⁴ Stakeholder responses to the 2016 PIA Consultation can be found here:

<https://www.ofcom.org.uk/consultations-and-statements/category-2/wholesale-local-access-market-review-proposals-PIA>

³⁰⁵ Openreach response to the 2016 PIA Consultation, paragraph 204.

existing asset and into new asset construction is unjustified and disproportionate as it should not be obligated to build a new duct network.

Requirement to make adjustments to infrastructure

- A6.4 Most stakeholders agreed with our proposal that Openreach should be required to make adjustments in order to facilitate access and ensure the remedy is effective.³⁰⁶ Vodafone believed the requirement is in the interests of good network maintenance by Openreach, and should go toward reducing other repair costs³⁰⁷ and that it did not anticipate extensive adjustments.³⁰⁸
- A6.5 Several stakeholders commented on the issues that would arise in the absence of a requirement for Openreach to make adjustments. For example, TalkTalk believed that without such an obligation, it may be that very little spine duct is used since a telecoms provider will either need to provide their own duct around a blockage, with the consequential high costs of joint boxes, or “pay BT an unknown cost and timescale to clear the blockage”.³⁰⁹ GTC noted that telecoms providers’ deployments could potentially become inefficient and costly, and local communities might endure more unnecessary disruptions.³¹⁰ CityFibre related its experience with its PIA trial in Southend, and predicted that without requiring adjustments, large swathes of the network would be isolated, raising telecoms providers’ costs and also creating uncertainty as to PIA’s viability over a given geography.³¹¹
- A6.6 Hyperoptic warned that without a requirement on Openreach to make adjustments, “the business case for CPs resolving blockages or installing by-pass ducts could become marginal or fail” which would “end up in a patchwork quilt effect of duct, leading to further issues with understanding which ducts belong to which CP.”³¹²
- A6.7 Virgin Media questioned the evidence we set out to support the case for Openreach to make adjustments. It said Openreach’s responsibility should be to ensure that its *existing* assets can be used as part of the PIA remedy when there is an identified demand and it should not be obliged to ready its network for PIA or act in anticipation of demand as this would be disproportionate given the uncertainty about future requirements.³¹³
- A6.8 Openreach agreed that an effective PIA remedy should support “access to existing physical infrastructure assets, supporting efficient utilisation of those assets and avoiding the costs of replicating those assets”.³¹⁴ Openreach pointed out that it “currently offer[s] services to allow certain work to be undertaken”. However, Openreach believed that any adjustments should be paid for by the telecoms providers requesting them.³¹⁵ This is discussed further in the cost recovery section, at paragraphs A6.145 to A6.171.

³⁰⁶ For example, see responses to the 2016 PIA Consultation from GTC, CityFibre, [3], The PAG, Vodafone, Hyperoptic and TalkTalk.

³⁰⁷ Vodafone response to the 2016 PIA Consultation, page 24.

³⁰⁸ Vodafone response to the 2016 PIA Consultation, page 25.

³⁰⁹ TalkTalk response to the 2016 PIA Consultation, page 3.

³¹⁰ GTC response to the 2016 PIA Consultation, page 8, question 5.5.

³¹¹ CityFibre response to the 2016 PIA Consultation, page 10.

³¹² Hyperoptic response to the 2016 PIA Consultation, page 14.

³¹³ Virgin Media response to the 2016 PIA Consultation, page 7.

³¹⁴ Openreach response to the 2016 PIA Consultation, page 33.

³¹⁵ Openreach response to the 2016 PIA Consultation, page 35.

Scope of adjustments

- A6.9 Stakeholders expressed a range of views on the scope of the adjustments which Openreach should be required to make. Most stakeholders agreed that the requirement should include repairing existing faulty infrastructure, but opinion was divided over whether this ought to cover the construction of new infrastructure in areas that BT already serves, for instance in building alternative routes to relieve congested tracts.
- A6.10 CityFibre believed the focus of the requirement should be for “incremental augmentations” rather than on extensive continuous lengths of infrastructure.³¹⁶ Call Flow commented that the scope of the requirement on Openreach should be limited to providing clear capacity along existing routes, but should include adjustments to distribution poles and poles requiring additional capacity.³¹⁷
- A6.11 GTC was in favour of a broader requirement which would include building new infrastructure in the cases of congestion relief, the provision of additional capacity, and the provision of infrastructure to the boundary of infill developments.³¹⁸ TalkTalk considered that the requirement on Openreach should apply to spine, some lead-in (not direct buried), joint boxes and poles, since the benefits of “certainty, cost minimisation incentives and parity” apply equally to all of these assets.³¹⁹ Vodafone considered that Openreach should repair and improve its network to support PIA, though it did not offer views (at this time) on how this requirement might be bounded.³²⁰
- A6.12 Most stakeholders agreed that the scope of the requirement on Openreach should not ordinarily extend to include the provision of infrastructure to areas unserved by Openreach. GTC observed that for such areas, it is likely that telecoms providers can undertake the works themselves.³²¹ Similarly, CityFibre considered that, if Openreach is asked to construct extensive new infrastructure, these works should be subject to an excess construction charge (ECC) regime, and that a clear mechanism should distinguish between acceptable “incremental augmentations” and extensive new build.³²² However, the PAG considered that there needed to be a clear obligation on Openreach to conduct repairs and construct new infrastructure where appropriate. The PAG argued that this obligation should be as broad as possible to reflect the same principles which would apply to BT if it were decongesting ducts for its own network roll-out.³²³
- A6.13 Virgin Media, which disagreed with establishing a requirement to adjust for capacity, considered that Openreach should neither be “required to clear all duct blockages in its network irrespective of demand from itself or others”, nor should it be “obliged to ready its network for PIA or act in anticipation of demand”. This is because it would be “disproportionate given the uncertainty about future requirements”.³²⁴ Furthermore, Virgin Media believed that Openreach should not be required to

³¹⁶ CityFibre response to the 2016 PIA Consultation, page 10.

³¹⁷ Call Flow response to the 2016 PIA Consultation, response to question 5.6, page 2.

³¹⁸ GTC response to the 2016 PIA Consultation, page 8, response to question 5.6.

³¹⁹ TalkTalk response to the 2016 PIA Consultation, page 3.

³²⁰ Vodafone response to the 2016 PIA Consultation, page 24.

³²¹ GTC response to the 2016 PIA Consultation, page 8, response to question 5.6.

³²² CityFibre response to the 2016 PIA Consultation, page 10.

³²³ The PAG response to the 2016 PIA Consultation, page 42.

³²⁴ Virgin Media response to the 2016 PIA Consultation, page 7.

augment or extend the network to the premise.³²⁵ It offered as examples: the case of direct buried duct to areas already served by BT, and new infrastructure to serve customers BT does not already serve.³²⁶

- A6.14 Openreach did not accept that a proportionate PIA remedy should require it to carry out potentially extensive and costly new civil infrastructure for its competitors to support their ultrafast broadband deployment. Openreach also expressed concern regarding our proposals to restrict its ability to recover the costs of such works in upfront charges.³²⁷ Openreach considered that our power to impose a remedy requiring it to make adjustments to its physical infrastructure is significantly restricted by Article 12 of the Access Directive. Openreach noted this suggests that where there is no capacity available, it is not feasible for an operator to provide network access or, at least, any access obligation should be necessarily limited.³²⁸

Scope of usage

Summary

- A6.15 There was overwhelming support from stakeholders to broaden the scope of PIA to include leased lines, citing reasons such as avoiding duplication of infrastructure assets, equivalence with BT and greater certainty in investments. Openreach and Virgin Media disagreed and did not support broadening the scope of PIA.
- A6.16 Stakeholders did not identify any additional or different approaches to broadening the scope of PIA, and most stakeholders preferred an any usage approach over a mixed usage approach.³²⁹ Stakeholders generally agreed with our concerns that an 'any usage' approach could impact BT's ability to recover its costs, and that it may lead to the inefficient use of scarce duct capacity by leased lines. Some stakeholders suggested mitigations to these risks.
- A6.17 Some stakeholders expressed a preference for a mixed usage approach, highlighting that this would prevent PIA being used to provide leased lines only. These stakeholders supported the generic rule, with Openreach as the exception, supporting the specific rule.³³⁰ In considering a mixed usage approach stakeholders questioned how it would be implemented, highlighting concerns about enforcement. Some stakeholders went further and stated that a mixed usage approach would risk being unworkable.
- A6.18 Those who commented on the geographic scope of PIA argued that, as currently defined, the PIA remedy is too narrow in terms of its geographic scope (i.e. the parts of the BT infrastructure network where PIA can be used). These respondents have argued that restrictions are both unnecessary and may severely impact the effectiveness of the remedy.³³¹ Four main points were made in support of a wider geographic scope:

³²⁵ Virgin Media response to the 2016 PIA Consultation, page 7.

³²⁶ For example, the cost of serving premises which have historically been above the threshold required under BT's requirement as the Universal Service Provider. See Virgin Media response to the PIA consultation, page 7.

³²⁷ Openreach response to the 2016 PIA Consultation, page 33.

³²⁸ Openreach response to the 2016 PIA Consultation, page 34.

³²⁹ Openreach thought we should have explicitly considered the status quo as an additional option noting this was their preference.

³³⁰ Openreach expressed this preference in the event the status quo was not maintained.

³³¹ [3<].

- It is likely that BT's local access network areas are smaller than those which other telecoms providers would deploy because of the age of BT's network deployment and its underlying copper technology. Consequently, limiting usage of PIA to areas corresponding in size to BT's local access areas may force telecoms providers to have smaller local access network areas than an efficient fibre-based network design might require.
- Defining local access by reference to BT's network may influence telecoms providers to locate their local access nodes in the centre of BT's local access areas.
- It is unclear how BT would interpret the geographic scope restrictions for PIA deployments that have a different topology to its own network, e.g. networks that do not have local access nodes comparable to those in BT's network.
- BT's own access network deployment (e.g. for FTTC services) is not limited so neither should rivals' network deployment be limited when using PIA.

Drivers for broadening the uses of PIA

A6.19 There was broad agreement from stakeholders with our analysis on the drivers for broadening uses of PIA, with the notable exceptions of Openreach and Virgin Media.

Innovation, flexibility and technology neutrality

A6.20 CityFibre commented on the flexibility that PIA offers telecoms providers as part of a mixed-build deployment, stating that "in a fibre optic network, capacity is substantially more 'fungible' and can readily serve different categories of customers". It also referred to preliminary evidence from its York FTTP trial which suggests there will be increased substitutability of products currently thought of as point-to-point and sitting within the business connectivity market, and point-to-multipoint and sitting within the wholesale local access market.³³² Hyperoptic made a similar comment, stating that "while fixed broadband and leased lines are definitions that fit today's world, there is no limitation to the extent to which widespread fibre will drive tomorrow's ubiquitous connectivity".³³³

A6.21 Vodafone, Three, Sky, Arqiva and [redacted] considered PIA could be broadened to include wireless/mobile backhaul.³³⁴ Arqiva noted the potential for 5G fixed wireless access small cell technology to provide "viable alternatives to copper and full fibre delivery of ultra-fast broadband services". It highlighted that the scale of fibre deployment to small cells will need to be significant and therefore any improvements to DPA should be made to benefit the deployment of fixed wireless access.³³⁵ Vodafone³³⁶ and [redacted]³³⁷ expressed similar sentiments.

Economies of scope and additional revenues from leased lines

³³² CityFibre response to the 2016 PIA Consultation, page 5.

³³³ Hyperoptic response to the 2016 PIA Consultation, page 9.

³³⁴ See responses to the 2016 PIA Consultation from Vodafone (paragraph 29), Three (pages 2 and 3), Sky (paragraph 7), Arqiva (pages 4-5) and [redacted]

³³⁵ Arqiva response to the 2016 PIA Consultation, page 4 and 5.

³³⁶ Vodafone response to the 2016 PIA Consultation, page 15.

³³⁷ [redacted] response to the 2016 PIA Consultation, page 2.

- A6.22 All stakeholders who commented on this, with the exception of Openreach, agreed with our definition and assessment of economies of scope and their likely sources. Most stakeholders emphasised the economies of scope to be achieved in the overlap of business and residential fibre connectivity, with several stakeholders stating that the ability to make use of economies of scope was essential to their use of PIA. Other stakeholders referred to the economies of scope enjoyed by BT and the principle of equivalence of inputs. However, Openreach and Sky expressed some reservations about the potential benefits from economies of scope.
- A6.23 CityFibre agreed with our analysis and observed that businesses and public bodies requiring fibre connectivity are often distributed across much the same geography as residential customers.³³⁸ CityFibre noted that the benefits of economies of scope are largest in the first stage of building point-to-multipoint network, where the pre-existing core network substantially reduces upfront costs, allowing the addition of revenue generating customers at a relatively early stage.³³⁹ [X]³⁴⁰.
- A6.24 [X] agreed with our comments regarding economies of scope. Hyperoptic also agreed with our assessment and stated that the ability to provide leased lines increases the market opportunity for the deployment of infrastructure to an urban area.³⁴¹ Hyperoptic said it expects, [X].³⁴²
- A6.25 The PAG also agreed with our assessment of economies of scope noting the greater pricing flexibility to be gained from economies of scope, as telecoms providers were able to “recover their common costs over a broader group of services based on willingness to pay”.³⁴³ Sky agreed, noting that enabling PIA users to capture “all revenue sources in the network footprint is necessary to improve the investment case for new networks”.³⁴⁴ TalkTalk believed that given the benefits from access seekers using PIA to provide business connectivity, our proposals should “allow the greatest degree of use of PIA for business connectivity as [Ofcom] considers is legally possible”.³⁴⁵ Call Flow also agreed with our comments and confirmed that its experience is broadly in line with our estimates of one non-residential delivery point to every 20 residential, although it expected this would be lower in more rural areas.³⁴⁶ Liquid Telecoms also commented on the difficulty of deploying fibre connectivity to residential premises only.³⁴⁷
- A6.26 Vodafone discussed the significance of economies of scope in scalable fibre deployment noting that [X]. Vodafone argued that given the business cases for new network build are already challenging, this evidence demonstrated that introducing artificial constraints to cost recovery and forcing duplication would further hamper investment decisions which are already difficult to show a positive return.³⁴⁸

³³⁸ CityFibre response to the 2016 PIA Consultation, pages 5-6.

³³⁹ CityFibre response to the 2016 PIA Consultation, page 6.

³⁴⁰ [X]

³⁴¹ Hyperoptic response to the 2016 PIA Consultation, page 10.

³⁴² Hyperoptic response to the 2016 PIA Consultation, page 4 (redacted)

³⁴³ The PAG response to the 2016 PIA Consultation, page 39.

³⁴⁴ Sky response to the 2016 PIA Consultation, page 3.

³⁴⁵ TalkTalk response to the 2016 PIA Consultation, page 14.

³⁴⁶ Call Flow response to the 2016 PIA Consultation, page 1

³⁴⁷ Liquid Telecom response to the 2016 PIA Consultation, Question 4.3.

³⁴⁸ Vodafone response to the 2016 PIA Consultation, pages 14-15.

- A6.27 Openreach acknowledged that economies of scale and scope could be enjoyed by a telecoms provider that intends to deploy an integrated FTTP network architecture.³⁴⁹ However, it considered that the potential economies of scope from sharing infrastructure between residential and business connectivity were limited, based on its experience. It added that telecoms providers had previously provided little evidence or commitment that widening usage rules would improve the business case for wider ultrafast broadband deployments”.³⁵⁰
- A6.28 Openreach considered that the unrestricted extension of usage could undermine the objective of the PIA remedy. It said if telecoms providers could use the PIA remedy exclusively to provide business connectivity, this would exhaust scarce resources intended to support mass ultrafast network deployment.³⁵¹

Comments on the proposal to broaden the scope of PIA

- A6.29 Openreach disagreed that PIA should be used for services currently in the business connectivity market, noting that we already rejected duct access as a remedy for business connectivity services. Openreach also argued that the ATI Regulations provides a legal mechanism for telecoms providers to gain access to infrastructure in addition to PIA for fibre networks.³⁵² Openreach criticised our proposals for assuming scope should be extended despite a lack of supporting analysis.³⁵³ Furthermore, it was unclear to Openreach what significant flexibility or innovation is being prevented by the scope of the existing remedy.³⁵⁴
- A6.30 Virgin Media also disagreed with the proposal to broaden the use of PIA, arguing that it would impose a duct access remedy “through the backdoor” in the business connectivity market without a proper review, after this was already rejected by us in the most recent BCMR in favour of a dark fibre remedy.³⁵⁵ Virgin Media emphasised that “the question is not whether the broadening of the scope [of PIA] improves the case for investment, but whether it is *necessary*”.³⁵⁶
- A6.31 Stakeholders expressed a range of views on the best way to broaden the scope of usage, with most stakeholders expressing a preference for an ‘any usage’ approach. Openreach considered that, in addition to ‘mixed usage’ and ‘any usage’ options we proposed, we should evaluate the option to maintain the current usage restrictions.³⁵⁷

Mixed usage in the local access area

³⁴⁹ Openreach response to the 2016 PIA Consultation, paragraph 113.

³⁵⁰ Openreach response to the 2016 PIA Consultation, paragraph 118.

³⁵¹ Openreach response to the 2016 PIA Consultation, paragraph 114-115.

³⁵² Openreach response to the 2016 PIA Consultation, paragraph 105.

³⁵³ Openreach response to the 2016 PIA Consultation, paragraph 106.

³⁵⁴ Openreach response to the 2016 PIA Consultation, paragraph 109.

³⁵⁵ Virgin Media response to the 2016 PIA Consultation, pages 4-5.

³⁵⁶ Virgin Media response to the 2016 PIA Consultation, pages 5-6.

³⁵⁷ Openreach response to the 2016 PIA Consultation, paragraph 119.

- A6.32 Sky³⁵⁸, Openreach³⁵⁹, Call Flow³⁶⁰, the Welsh Government and the Scottish Futures Trust³⁶¹ expressed a preference for establishing a mixed usage approach. These stakeholders highlighted the risk that providers could choose to use PIA mainly or exclusively to provide point-to-point leased lines for high value business connectivity customers with no intention or further plan to deploy large scale ultrafast broadband. This could in turn risk spare capacity being used for leased lines only.
- A6.33 These stakeholders supported having a generic mixed usage rule, except for Openreach, which preferred a specific rule. Openreach considered that a generic rule would lack certainty and transparency, and impose a “far greater resource burden on Ofcom and Openreach”, while a specific rule could be “better designed to achieve the specific outcomes a mixed usage approach is intended to achieve”.³⁶² Furthermore, it considered that these rules should relate to the number of residential premises connected, and not solely focus on the number of residential premises passed”.³⁶³ Alternatively, Hyperoptic preferred a generic rule over a specific rule relating to a defined ratio of residential to leased lines, remarking that a delineation between ultrafast broadband and leased lines not “philosophically possible”.³⁶⁴
- A6.34 Other stakeholders highlighted the risks and challenges in setting a mixed usage rule, including difficulty in enforcement, inequivalence with BT and concerns about confidentiality. Some stakeholders believed that these risks rendered a mixed usage approach unworkable.
- A6.35 The most common concern expressed by stakeholders was that a mixed usage approach would be difficult to enforce. For example, Three highlighted that when PIA is used as part of a mixed-build, it will be difficult to attribute the PIA elements of a network to specific uses; but if usage is considered in aggregate, then the self-built elements of the telecoms provider’s network will be unnecessarily constrained by the usage restriction.³⁶⁵ Three was also concerned that a mixed usage approach, which was enforced by a dispute resolution mechanism, would allow Openreach to deny an application for PIA “based on ambiguously defined usage rules”.³⁶⁶ Colt, Flomatik, the PAG and several other stakeholders shared this concern.
- A6.36 Concerned with maintaining the confidentiality of commercially sensitive material, several stakeholders requested that Openreach was not be entrusted with the responsibility of assessing compliance with usage restrictions.³⁶⁷ Some of these stakeholders suggested alternative gating mechanisms to mitigate the risks associated with any usage, while avoiding the complications of setting a mixed usage rule.

³⁵⁸ Sky response to the 2016 PIA Consultation, page 3.

³⁵⁹ Openreach expressed this preference in the event the status quo was not maintained. See Openreach response to the 2016 PIA Consultation, paragraph 120.

³⁶⁰ Call Flow response to the 2016 PIA Consultation, page 1

³⁶¹ Scottish Futures Trust response to the 2016 PIA Consultation, page 4

³⁶² Openreach response to the 2016 PIA Consultation, paragraph 125.

³⁶³ Openreach response to the 2016 PIA Consultation, paragraph 128.

³⁶⁴ Hyperoptic response to the 2016 PIA Consultation, page 10.

³⁶⁵ Three response to the 2016 PIA Consultation, paragraph 2.15.

³⁶⁶ Three response to the 2016 PIA Consultation, paragraph 2.15.

³⁶⁷ For example, see responses to the 2016 PIA Consultation from Three (page 5), Hyperoptic (page 11) and Colt (page 4).

A6.37 The PAG questioned whether usage restrictions for PIA were lawful, claiming that the Common Regulatory Framework does not permit limiting the purposes for which SMP remedies can be deployed, as well as challenging the legality of usage restrictions under general competition law.³⁶⁸

Any usage in the local access area

A6.38 Most stakeholders preferred an any usage approach. The reasons provided included: productive efficiency to avoid wasteful duplication of infrastructure assets, equivalence with BT, greater certainty in investments for potential PIA users and minimum complexity in design and enforceability. Stakeholders provided assessments of the potential risks involved with an any usage rule and suggested how to mitigate these. There was general agreement that an any usage rule could pose problems for BT's cost recovery model and that there was the risk of inefficient use of scarce duct capacity by leased lines. In the main, stakeholders considered that we overstated the risks associated with any usage. Openreach was the notable exception and was opposed to the any usage approach.³⁶⁹

A6.39 Regarding the risk to BT's cost recovery, most stakeholders felt the risk could be safely mitigated. Vodafone said BT was excessively recovering costs under the current regime and any impact caused by business connectivity under future PIA would be factored into this margin.³⁷⁰ Three disagreed with our estimate of an £80m p/a revenue shortfall for BT in relation to a PIA remedy without usage restrictions, claiming that the figure relies on false assumptions.³⁷¹

A6.40 Regarding the risk of inefficient use of scarce duct space, Colt considered that this could be addressed by implementing network engineering rules, citing engineering rules implemented by ARCEP (the French telecoms regulator) in 2011. It further argued that the concern about "cherry-picking" of duct space was overstated because in their experience abroad "the cost of picking a single cherry is too high".³⁷² Similar points were made by some other stakeholders.

A6.41 Hyperoptic, among several other stakeholders, claimed that in practice both the risk to cost recovery and the risk of inefficient duct use would be significantly mitigated by telecoms providers in the business connectivity market preferring the dark fibre access remedy.³⁷³

*Geographic scope*³⁷⁴

A6.42 Colt argued that "access should be agnostic as to the segment of the access provider's network that the facility belongs".³⁷⁵ It considered that "the classification of a facility as 'access' or 'backhaul' is necessarily arbitrary and only relative to a particular network architecture. It is quite possible for a given network route to belong in the 'backhaul' segment of one network while belonging in the 'access'

³⁶⁸ The PAG response to the 2016 PIA Consultation, page 27.

³⁶⁹ Openreach response to the 2016 PIA Consultation, page 26.

³⁷⁰ Vodafone response to the 2016 PIA Consultation, page 19.

³⁷¹ Three response to the 2016 PIA Consultation, pages 5-6.

³⁷² Colt response to the 2016 PIA Consultation, page 5.

³⁷³ Hyperoptic response to the 2016 PIA Consultation, page 9.

³⁷⁴ Certain stakeholders referred to this topic as 'topographic restrictions'.

³⁷⁵ Colt response to the 2016 PIA Consultation, page 6.

segment of another network”.³⁷⁶ Liquid Telecom also considered that geographic restrictions could “materially constrain network designs and business plans”.³⁷⁷

- A6.43 Hyperoptic said that, while restricting usage of PIA to the local access area is enforceable, it also has its drawbacks. Hyperoptic said that tying the definition of local access to Openreach’s local access radius was inequivalent to how it was used by BT. It argued this would hinder the ability for competitors to use the most efficient network topology to match their addressable market and therefore “impose restrictions that would otherwise hamper a business plan”.³⁷⁸
- A6.44 The PAG considered that ‘topographic restrictions’ were “wholly unnecessary, wrong in principle, and may severely impact the effectiveness of the PIA remedy.” It remarked that “topographic restrictions require a CP using duct access to replicate the network topology used by BT and create significant uncertainty where the network design departs from the model Ofcom expects”. Accordingly, the PAG argued that “PIA should be available on a manhole-to-manhole basis and without regard to artificial barriers around the ‘local access area’”.³⁷⁹

Non-discrimination requirements

Summary

- A6.45 Overall stakeholders were supportive of our proposals, with no stakeholder saying that we should not apply a principle of equivalence. However, stakeholders were divided on the degree of equivalence that it might be appropriate to impose. This range of views was typically reflected in concerns over how equivalence should be implemented: some stakeholders felt equivalence should only be applied when justified, while others felt equivalence should be applied in all situations and exceptions only granted when justified.
- A6.46 Those stakeholders who supported the imposition of EOI were split as to whether it should apply to all products that consume duct access, or only to new products such as FTTP. In general, those who supported EOI across all products did so as they felt this was the only way to ensure Openreach would be unable to discriminate in favour of its own downstream products. Those who were more supportive of EOI applied to new products only felt this would be a more proportionate and practical solution.
- A6.47 Whilst there was support in general for the principle of equivalence, Openreach opposed EOI as a remedy on the grounds of effectiveness and proportionality.
- A6.48 In responding to the issue of equivalence in cost recovery and charges, some stakeholders expressed concerns about our suggestion to pass the costs of build and enablement to Openreach, while others argued that only by ensuring Openreach was responsible for recovering all costs would PIA become effective. We discuss this in greater detail in paragraphs A6.155 to A6.157 below.

³⁷⁶ Colt response to the 2016 PIA Consultation, page 7.

³⁷⁷ Liquid Telecom response to the 2016 PIA Consultation, response to question 4.6.

³⁷⁸ Hyperoptic response to the 2016 PIA Consultation, page 10.

³⁷⁹ The PAG response to the 2016 PIA Consultation, pages 16-17.

- A6.49 Finally, although all stakeholders agreed that costs and processes were a necessary focus, they questioned why other factors such as contract length, ongoing maintenance or wayleaves were also not prioritised.

Aiming for no material disadvantage

- A6.50 Openreach was supportive of what it interpreted to be our aim, of enabling other providers to “use similar processes and systems as Openreach’s use for similar purposes”³⁸⁰ and was supportive of our approach to process equivalence. Openreach was concerned with several of the proposals put forward, arguing that they go beyond what is “reasonable, necessary and proportionate particularly in the context of cost recovery, usage and SLA/Gs”³⁸¹. It suggested that the primary focus of equivalence should be applied to provide access to information and existing infrastructure.

Focus on two main areas of equivalence: Processes and costs

- A6.51 Hyperoptic agreed that processes and costs are key areas of focus, but it also suggested that equivalence is extended in scope: new builds; billing; reservations; and in life management.³⁸² Similarly, Liquid Telecom agreed that our initial focus should be on processes and costs, but other important areas should be addressed in due course.³⁸³
- A6.52 Both the PAG³⁸⁴ and Vodafone³⁸⁵ highlighted the link between contract length with Openreach and equivalence. Vodafone suggested that without the availability of longer contract lengths there was a risk of discrimination through the early termination of licences or unilateral changes to the licence term. Vodafone also highlighted clauses in the current PIA contract which it felt may be problematic.
- A6.53 Virgin Media suggested that equivalence should be extended to access to multi dwelling units, as this presented a barrier to build. It explained that the “barrier to build may be lessened by a requirement on BT to share infrastructure within buildings because landlords may be more willing to sign wayleave agreements”.³⁸⁶

Equivalence of Inputs

Application of EOI as far as practical

- A6.54 Openreach were supportive of our approach, highlighting its pragmatism. It considered that a requirement for Openreach to self-consume PIA on EOI terms would not be pragmatic. This is because it would “generate operational inefficiencies through additional internal hand-offs within Openreach and would likely require costly new systems and processes to be developed”.³⁸⁷
- A6.55 Openreach claimed that the recent changes that it had made to PIA processes and its infrastructure mapping database demonstrated the progress that had been made

³⁸⁰ Openreach emphasis. See Openreach response to the 2016 PIA Consultation, page 12.

³⁸¹ Openreach response to the 2016 PIA Consultation, page 19.

³⁸² Hyperoptic response to the 2016 PIA Consultation, page 8.

³⁸³ Liquid Telecom response to the 2016 PIA Consultation, page 3 and 4.

³⁸⁴ The PAG response to the 2016 PIA Consultation, page 15 and 35.

³⁸⁵ Vodafone response to the 2016 PIA Consultation, page 10.

³⁸⁶ Virgin Media response to the 2016 PIA Consultation, page 2.

³⁸⁷ Openreach response to the 2016 PIA Consultation, paragraph 7.

towards an equivalent PIA process. Openreach also considered that requirements to make additional changes to its existing processes could impede its ability to work efficiently and increase its costs. Openreach interpreted our proposal of equivalence as practical changes which we could demonstrate that without which other telecoms providers would be at a material disadvantage to BT.³⁸⁸

- A6.56 Sky had similar, albeit non-specific, concerns about the impact of enforcing equivalence in its response, noting that “it is important that the steps Ofcom takes in improving DPA do not unduly harm the other important products services which also use BT’s ducts and poles. This principle should be applied when considering whether proposals to improve DPA are proportionate and justified”.³⁸⁹

A wider and stricter application of EOI

- A6.57 Other stakeholders interpreted our proposals on equivalence differently, believing that the application of EOI should be stricter.
- A6.58 TalkTalk insisted that it was essential for EOI to require BT to use the PIA product at scale early on to ensure a high-quality PIA product and questioned how our proposal to apply EOI ‘as far as practical’ would be applied.³⁹⁰ It suggested that the application of EOI should be the default position. This view was also held by Vodafone. Three expressed disappointment that “Ofcom is only proposing to apply an equivalence of processes and systems obligation for new NGA deployments as far as is practicable despite previously stating that it would work to apply EOI to BT’s provision of DPA”.³⁹¹
- A6.59 TalkTalk also felt that rather than limiting EOI to just G.fast and FTTP, it should apply to all products which consume an “internal PIA”. TalkTalk felt that we should set an enforceable timetable by which Openreach would consume PIA on an EOI basis. It also suggested that “where EOI does not apply (i.e. BT does not consume the PIA product/ process) there should be an obligation on BT to provide transparency of the products/ processes it does use”.³⁹² This would be to ensure Openreach is unable to discriminate in favour of its own downstream products. The PAG made a similar point, stating that “anything less than EOI will not provide a basis for effective and sustainable competition.” Noting that it was difficult for a third party to understand where it may be acceptable for Openreach processes to depart from EOI, it suggested that an “independent review is undertaken to elucidate these differences”.³⁹³ Vodafone also made a similar point.
- A6.60 The PAG went on to state that if EOI was not to apply, we “must support this conclusion with a detailed cost-benefit analysis (including proper estimates of how its decision on EOI will impact take-up of PIA)”.³⁹⁴ The PAG also said that our “proposed justifications for not imposing EOI are insufficient”. It summarized our reasoning as being “BT does not currently provide PIA on an SMP basis, so we will not require it to do so” and that because “PIA is not currently widely used and therefore EOI is disproportionate.” The PAG criticised this reasoning for being

³⁸⁸ Openreach response to the 2016 PIA Consultation, paragraph 41.

³⁸⁹ Sky response to the 2016 PIA Consultation, pages 2-3.

³⁹⁰ TalkTalk response to the 2016 PIA Consultation, page 5.

³⁹¹ Three response to the 2016 PIA Consultation, page 7.

³⁹² TalkTalk response to the 2016 PIA Consultation, page 6.

³⁹³ The PAG response to the 2016 PIA Consultation, page 38.

³⁹⁴ The PAG response to the 2016 PIA Consultation, page 4.

“circular” and being an insufficient basis for “departing from the important principle of EOI”.³⁹⁵

- A6.61 Another stakeholder [X] also expressed this point noting that “BT lines of business have to consume other Openreach products such as EAD and DFA on an equivalent basis and we struggle to see how the consumption of PIA should differ”. It criticised the argument put forward by us to mandate full EOI, suggesting that this “would necessitate BT to significantly have to re-engineer its own internal processes and systems appears to omit the fact that non-BT CPs face similar challenges, and the associated costs, in order to consume PIA”.
- A6.62 The PAG also wanted EOI to be applied to Openreach on a strict basis, which would include a “must use obligation” across all products. It argued that EOI would need to apply to Openreach more broadly to be effective since Openreach did not currently have plans to deploy FTTP broadband at scale itself. The PAG expressed concerns that without applying EOI in this way, our “material disadvantage” approach “provides significant scope for BT to game any such obligation, and will create a significant regulatory burden for Ofcom in terms of monitoring and enforcement”.³⁹⁶ The PAG also claimed that applying strict EOI today would help with longer term outcomes including further deregulation of active products and that delays in its implementation will not avoid the need for these costs to be incurred.³⁹⁷
- A6.63 The PAG stated that this strict application of EOI would lead to, for example, Openreach using the same systems and processes for the planning stage, as well as “equivalence with the terms on which BT engages with its own external contractors who carry out build work for them.”³⁹⁸ Three made a similar point.³⁹⁹

Other comments and suggestions relating to EOI

- A6.64 Most of the other respondents who commented on EOI made similar points to TalkTalk and the PAG. However, some stakeholders provided a broader range of responses on the totality of the application of EOI. For example, Vodafone noted that “unless Ofcom is putting in place organisational separation inside Openreach, full Equivalence and transparency will not be achievable. However, this should still remain the goal – with non-equivalence outcomes being the exception rather than the expectation”.⁴⁰⁰ For Vodafone, EOI was not an end in itself, but a means to provide “the necessary confidence to invest”.
- A6.65 In its response, Vodafone also provided more specific suggestions as to how EOI could be applied, stating that moving the PIA product to Openreach’s EMP platform would mean would mean that “BT and CPs order it in same way]” However this idea was contradicted by another stakeholder [X] who noted that we must ensure that the systems and processes offered by Openreach to consume PIA are not systems that have already been developed and consumed by BT lines of business. This would put industry at a significant commercial disadvantage.

³⁹⁵ The PAG response to the 2016 PIA Consultation, page 11.

³⁹⁶ The PAG response to the 2016 PIA Consultation, page 8.

³⁹⁷ The PAG response to the 2016 PIA Consultation, paragraph 32.

³⁹⁸ The PAG response to the 2016 PIA Consultation, paragraph 13b.

³⁹⁹ Three response to the 2016 PIA Consultation, page 7.

⁴⁰⁰ Vodafone response to the 2016 PIA Consultation, page 3.

- A6.66 Separately, CityFibre considered the application of equivalence would be more valuable on a forward-looking basis. It saw “no reason at all why BT should not use the same processes and systems itself where it is building new network infrastructure, such as new ultrafast services”.⁴⁰¹
- A6.67 On the question of whether BT should use the same systems and processes as others using PIA when installing ultrafast broadband services at scale, one telecoms provider [redacted] suggested that EOI should not only include FTTP and G.fast but also include SLU backhaul to ensure BT “followed the same rules for its own FTTC backhaul”.⁴⁰²
- A6.68 Finally, TalkTalk felt that the costs of imposing EOI would not be high, suggesting that “EOI can be implemented for the most part by exposing existing internal systems to external CPs”.⁴⁰³

Improvements to PIA processes and systems

Summary

Planning and surveying

- A6.69 There was a broad agreement among respondents to our 2016 PIA Consultation that we had correctly identified the problems faced by telecoms providers using PIA in terms of planning and surveying. These stakeholders generally supported the direction of our proposals to improve the planning and survey stages for PIA.
- A6.70 Openreach argued that the problems we identified related to the pre-January 2017 PIA product and had been addressed by the product amendments and the PIA Digital Map Tool introduced in January 2017, and further planned enhancements to the tool due in March 2017.
- A6.71 Openreach indicated that it did not object to further PIA developments if they were reasonable, proportionate and where telecoms providers had shown evidence of using the new enhanced systems and processes at scale.
- A6.72 Openreach objected to our suggestion that it should highlight geographic areas in the PIA Digital Map Tool where telecoms providers are undertaking planning activity to avoid duplication of plans using the same network elements. It suggested that releasing such planning information would present a material competition law risk.

Network Deployment

- A6.73 Openreach argued that the concerns identified needed to be set in the context of the new PIA processes launched in January 2017. Under these changes PIA telecoms providers can conduct their own enabling works.
- A6.74 Several stakeholders⁴⁰⁴ stressed the importance of having SLAs in relation to build and enabling works since without these there is uncertainty around the timescales

⁴⁰¹ Vodafone response to the 2016 PIA Consultation, paragraph 5.

⁴⁰² [redacted] response to the 2016 PIA Consultation, page 1.

⁴⁰³ TalkTalk response to the 2016 PIA Consultation, page 6.

⁴⁰⁴ See responses to the 2016 PIA Consultation from the PAG, Virgin Media, Vodafone and Hyperoptic.

for deploying their networks. Openreach highlighted the challenges involved in setting meaningful SLAs/SLGs given many of the timing variables are not in Openreach's control and will be specific to the individual job.⁴⁰⁵

- A6.75 Several stakeholders⁴⁰⁶ advocated a mixed model approach where Openreach has a requirement to make adjustments to the infrastructure but where telecoms providers also have the opportunity to progress work on behalf of Openreach. In contrast, Openreach raised concerns over a mixed approach due to the management requirements, additional costs and the risk of moral hazard where the more complex and resource intensive jobs are passed to Openreach to complete.
- A6.76 Openreach considered that if telecoms providers wanted increased control and certainty over timescales for build works then a self-provision model would be more appropriate. However, it also considered that further thought would be needed on the process developments to address operational and practical challenges including meeting quality standards and alignment with Openreach's own planned infrastructure upgrades.
- A6.77 Some stakeholders were supportive of deferring PIA rental charges until the assets were ready for use, while others noted this presented a gaming opportunity to the access seeker and suggested various ways of bounding such a proposal to discourage this behaviour. For example, Hyperoptic suggested that deferred PIA rental charges should be limited to orders relating to an exchange area, while Openreach argued that limiting the deferral of PIA rental charges to orders relating to an 'Optical Local Exchange' area was not granular enough and instead suggested cabinet areas (currently the basis for FTTC deployments) or fibre spine and splitters (the basis for FTTP deployment).

Connecting the customer

- A6.78 Openreach argued that our dropwire upgrade approach did not represent access to existing Openreach duct or pole infrastructure but rather formed part of the construction of a new FTTP network. As such, we would be imposing a new access condition which we had failed to evidence.
- A6.79 Openreach identified operational challenges that would need to be addressed with the dropwire upgrade approach. Other stakeholders highlighted that different telecoms providers may require different technical solutions. Vodafone argued that Ofcom should not prescribe a single solution for overhead lead-ins but enable a range of options.
- A6.80 Several stakeholders indicated that a dropwire upgrade approach using a hybrid copper/micro tube may be a better technical solution compared to the hybrid copper/fibre approach we suggested. For example, the PAG did not agree with our proposed approach to underground lead-ins and suggested that the same options as proposed for overhead lead-ins should apply for duct lead-ins (i.e. where Openreach supply the lead-in and recover the cost over the longer-term).

⁴⁰⁵ For example, local authority permissions for street works.

⁴⁰⁶ See responses to the 2016 PIA Consultation from Virgin Media, Vodafone and the PAG.

Accreditation

- A6.81 In our 2016 PIA Consultation we did not discuss issues around the processes adopted by Openreach for accrediting network engineers contracted by PIA users. However, a number of stakeholders referred to accreditation in their responses.
- A6.82 Flomatik argued that the accreditation process required by Openreach is difficult to navigate and that simplification and coordination was necessary to make it usable for telecoms providers.⁴⁰⁷ Similarly, CityFibre was critical of the existing accreditation regime, finding it to be “highly inappropriate”. It remarked that “the training and certification that Openreach recognises is lengthy and expensive”. Furthermore, there was said to be a “shortage of qualified trainers to provide this”.⁴⁰⁸ CityFibre also claimed that contractors employed by Openreach are not subject to the same accreditation requirements as those contracted to telecoms providers for self-provision. CityFibre claimed that the contractors it employed were permitted to perform certain tasks for Openreach, but were not permitted to undertake the same work when contracted by CityFibre.⁴⁰⁹

Planning and surveying

- A6.83 There was a broad agreement from most stakeholders⁴¹⁰ who commented on the issue, that we had correctly identified the problems faced by telecoms providers using PIA at the planning and survey stage.
- A6.84 CityFibre argued that Openreach must be encouraged to offer network information in a manner that was more immediately useable and capable of being imported into the telecoms providers’ own GIS network planning tools.⁴¹¹ It had specific proposals on how the format and content of the information available to telecoms providers could be of the same level of granularity as that accessible to Openreach’s own planners. It also suggested that either Openreach should be required to conduct surveys to improve the accuracy of its network records or where telecoms providers undertake surveys they can cross-charge Openreach for that activity.⁴¹² Hyperoptic also suggested that a cross-charging mechanism could apply.⁴¹³
- A6.85 Hyperoptic referred to several other issues faced by telecoms providers in the planning and surveying stage that we did not discuss in the 2016 PIA Consultation. These included needing to have access to information about where access restrictions are present in Openreach’s infrastructure, access to Openreach’s infrastructure upgrade plans and plans for build and enabling works. It also raised a concern about duct capacity being reserved for future use by Openreach.⁴¹⁴ Furthermore, Hyperoptic argued that telecoms providers should have access to the following information: historical data on duct blockages and clearances, enabling works and the most recent access date in an area.⁴¹⁵

⁴⁰⁷ Flomatik response to the 2016 PIA Consultation, page 1.

⁴⁰⁸ CityFibre response to the 2016 PIA Consultation, page 10.

⁴⁰⁹ CityFibre response to the 2016 PIA Consultation, page 10.

⁴¹⁰ See responses to the 2016 PIA Consultation from CityFibre, Virgin, The PAG, [X], Vodafone, Hyperoptic, [X] and Call Flow (page 1).

⁴¹¹ CityFibre response to the 2016 PIA Consultation, page 9.

⁴¹² CityFibre response to the 2016 PIA Consultation, page 9.

⁴¹³ Hyperoptic response to the 2016 PIA Consultation, page 12.

⁴¹⁴ Hyperoptic response to the 2016 PIA Consultation, page 12.

⁴¹⁵ Hyperoptic response to the 2016 PIA Consultation, page 13.

- A6.86 The PAG recommended that we look at the types of planning and survey solutions adopted in countries such as Spain and Portugal as a guide to the types of models which meet the needs of telecoms providers.⁴¹⁶
- A6.87 Openreach considered that the new PIA product process launched on 3 January 2017 and its PIA Digital Maps system on 30 January 2017 (with a further enhanced version due in March 2017), would address all the major problems identified in the 2016 PIA Consultation. It felt that these changes would place telecoms providers on an equal footing with Openreach for planning and surveying, allowing access to the same network record information.⁴¹⁷ Openreach highlighted that telecoms providers will be able to access relevant information at a granularity sufficient to enable planning, ordering and billing. Telecoms providers will also be able to import network data into their own GIS network planning tools. Openreach considered that the new PIA processes and systems would give telecoms providers greater flexibility, enabling them to conduct stand-alone field surveys or combine the survey stages with network build activity.⁴¹⁸
- A6.88 Openreach also indicated that telecoms providers will be able to automate the population of order forms, using the downloaded digital maps information (from its PIA Digital Maps system), which should make the process less labour intensive.⁴¹⁹ It also highlighted that access seekers are not required to complete survey returns to Openreach, instead only being required to feedback completed routes on completion of their deployment.⁴²⁰ Openreach indicated that that it did not object to further developments as long as they were reasonable, proportionate and that telecoms providers had shown evidence of using the new enhanced systems and processes at scale.⁴²¹
- A6.89 Openreach highlighted that restrictions on the PIA system would be necessary to prevent the misuse of commercially sensitive information, but these restrictions would go no further than necessary and will be kept under ongoing review.⁴²² Openreach also highlighted the importance of it being able to approve elements of network build that access seekers wish to carry-out (or have deployed). Maintaining control of its assets was important to ensure that sensitive sites are not impacted and that deployments are in-line with the approved usage for the product.⁴²³
- A6.90 Furthermore, Openreach objected to proposals for it to highlight areas where telecoms providers were planning to deploy a network using PIA to avoid duplications of plans using the same network elements. Openreach argued that the release of planning information which is not related to the use of PIA had not been objectively justified and was not relevant, necessary or proportionate to the remedy. Openreach also considered that releasing planning information would present a material competition law risk. Openreach indicated that, if we are seeking to allow joint working on new infrastructure construction, then this is already subject to

⁴¹⁶ The PAG response to the 2016 PIA Consultation, page 41.

⁴¹⁷ Openreach response to the 2016 PIA Consultation, page 29.

⁴¹⁸ Openreach response to the 2016 PIA Consultation, page 30.

⁴¹⁹ Openreach response to the 2016 PIA Consultation, page 31.

⁴²⁰ Openreach response to the 2016 PIA Consultation, page 29.

⁴²¹ Openreach response to the 2016 PIA Consultation, page 32.

⁴²² Openreach response to the 2016 PIA Consultation, page 30.

⁴²³ Openreach response to the 2016 PIA Consultation, page 29.

various bodies and processes which enable multiple utilities and telecoms providers to work together to minimise road closures/costs etc.⁴²⁴

- A6.91 Several respondents supported our initial view that systems developments costs should be recovered across all users of Openreach's network⁴²⁵, while Virgin Media and Openreach disagreed. This topic is discussed further in paragraphs A6.168 to A6.171.

Network deployment

- A6.92 Openreach did not agree that we had correctly identified the problems relating to the network deployment stage or that our conclusions necessarily followed from the analysis. Openreach considered that the subject of build and enabling works is a complex subject and warrants further analysis before a reasonable approach to the division of responsibilities, funding and prospective SLAs/SLGs can be resolved.⁴²⁶ Openreach also argued that the issues identified need to be reassessed given the new PIA processes launched in January 2017, given that access seekers can conduct their own enabling works, allowing them to dictate their own timescales.⁴²⁷
- A6.93 Vodafone argued that Openreach's processes for PIA should enshrine a principle of enabling "fluid working" by telecoms providers. Processes should be designed with the objective of avoiding telecoms providers having to halt work at any stage due to the need to wait on Openreach for information, enablement works, permissions or inspections.⁴²⁸

SLAs and SLGs

- A6.94 Several stakeholders stressed the importance of having SLAs for new infrastructure build and enabling works, stating that without them there would be limited incentive for Openreach to complete work in reasonable timescales. Indeed, Vodafone⁴²⁹ and Hyperoptic⁴³⁰ suggested that SLAs and SLGs should be in place for all parts of the process – order validation, planning and survey works, physical work on site. Virgin Media suggested that a seven day SLA would be appropriate for duct blockage clearances in verges/footways, while a 30-day SLA should apply for clearing carriageway blockages.⁴³¹
- A6.95 The PAG suggested that any SLAs should be based on the typical service levels Openreach provides for itself when it performs enabling works.⁴³² CityFibre suggested that the SLA for enabling works should be associated with the number of blockages and the physical location. In order to make the process more effective, CityFibre suggested that Openreach should respond to a request within five days and provide a planned date of works with ten days of the request. CityFibre also argued that when a blockage is identified the works should include the proving of

⁴²⁴ Openreach response to the 2016 PIA Consultation, page 30.

⁴²⁵ See responses to the 2016 PIA Consultation from CityFibre, Hyperoptic, the PAG, Vodafone, SSE plc and Call Flow.

⁴²⁶ Openreach response to the 2016 PIA Consultation, page 32.

⁴²⁷ Openreach response to the 2016 PIA Consultation, page 33.

⁴²⁸ Vodafone response to the 2016 PIA Consultation, page 23.

⁴²⁹ Vodafone response to the 2016 PIA Consultation, page 25.

⁴³⁰ Hyperoptic response to the 2016 PIA Consultation, page 15.

⁴³¹ Virgin Media response to the 2016 PIA Consultation, page 7 and 9.

⁴³² The PAG response to the 2016 PIA Consultation, page 43.

the “box to box” section associated with the network reservation request to prevent multiple requests and visits.⁴³³

- A6.96 Openreach highlighted the challenges involved in setting SLA/SLGs that provide meaningful certainty of delivery timescales. It argued that whilst this may be possible for certain elements of an end-to-end process, providing a single end-to-end SLA/SLG has too many variables that are out of Openreach control to give certainty of delivery on a job by job basis.⁴³⁴ Openreach also argued that any SLA/SLGs should only apply where the only option available to the telecoms provider is to use Openreach as it considered there is a tendency to push the more difficult and risky aspects of network build to Openreach.⁴³⁵
- A6.97 Vodafone proposed that Openreach reporting its performance relative to the SLA will give transparency to the extent to which it complying with Vodafone’s aim of “fluid working”. Vodafone also suggested that Openreach should be obliged to consult with us, in addition to telecoms providers and the OTA to formulate a work plan for continuing to improve QoS as take-up of PIA increases and that there should be a deadlock-breaking mechanism in instances where telecoms providers and Openreach do not reach an agreement.⁴³⁶ [3<] suggested that any SLAs/SLGs be agreed between industry and Openreach in the first instance.⁴³⁷

Self-provision of works

- A6.98 CityFibre considered that self-provision would be the most reliable method in managing the process for large scale network deployment where that telecoms provider has the functionality to construct networks.⁴³⁸ However it suggested there may be some circumstances where even telecoms providers that predominantly self-provide will find it more practicable to ask Openreach to conduct certain activities, for example particularly in sensitive (e.g. security-restricted) areas.⁴³⁹
- A6.99 Virgin Media⁴⁴⁰, Vodafone⁴⁴¹ and the PAG⁴⁴² considered that a mixed approach would be best so Openreach would have a requirement to make adjustments to its infrastructure, but telecoms providers would have the option to progress repairs and minor augmentations works on behalf of Openreach if that could facilitate a faster deployment plan for themselves. Vodafone indicated there would need to be a clear process for determining which party should progress the work in which scenario.⁴⁴³
- A6.100 Hyperoptic also supported the option of performing their own civil works. However, it considered that Openreach’s economies of scale enable it to command cheaper rates from civil contractors than would be possible for telecoms providers’ self-

⁴³³ CityFibre response to the 2016 PIA Consultation, page 12.

⁴³⁴ Openreach response to the 2016 PIA Consultation, page 40.

⁴³⁵ Openreach response to the 2016 PIA Consultation, page 40.

⁴³⁶ Vodafone response to the 2016 PIA Consultation, page 25 and 26.

⁴³⁷ [3<] response to the 2016 PIA Consultation, page 12.

⁴³⁸ CityFibre response to the 2016 PIA Consultation, page 11.

⁴³⁹ CityFibre response to the 2016 PIA Consultation, page 11.

⁴⁴⁰ Virgin Media response to the 2016 PIA Consultation, page 8.

⁴⁴¹ Vodafone response to the 2016 PIA Consultation, page 27.

⁴⁴² The PAG response to the 2016 PIA Consultation, page 42.

⁴⁴³ Vodafone response to the 2016 PIA Consultation, page 27.

provision. Therefore, it considered that Openreach should be primarily responsible to provide a duct network that is fit for purpose for all telecoms providers.⁴⁴⁴

- A6.101 Openreach considered that if access seekers wanted increased control and certainty of delivery then a self-provision model is best applied. However, it believed further thought was required on the development of the self-build process and how this could meet Openreach requirements for delivering network build standards, quality of work and cost control.⁴⁴⁵ It also highlighted that any self-provision model would need to ensure that the control required by Openreach does not create an inefficient level of touch points between telecoms providers and Openreach. These plus the associated information flows could diminish the potential benefits of self-provision.⁴⁴⁶
- A6.102 Openreach supported our proposal that would allow a telecoms provider to complete enabling immediately and without intervention from Openreach and noted that this approach is now available to telecoms providers as part of January 2017 process changes. However, it did not support the proposal for Openreach to carry out enabling work at its own expense (unless in exceptional circumstances) or for telecoms providers to be able to charge Openreach when the telecoms provider undertakes the enabling works.⁴⁴⁷ Furthermore, Openreach believed for it to fund any enabling work, it needed to be convinced such works were necessary and that the telecoms provider had done everything possible to avoid such costs. Openreach highlighted that such steps for approval would add complexity, as well as extend lead times for the telecoms provider's deployment.⁴⁴⁸
- A6.103 Several stakeholders, including Openreach, agreed that cable joint restrictions for PIA users should be relaxed.⁴⁴⁹ Openreach added that this improvement had been delivered in the new January 2017 PIA product changes. Virgin Media suggested that the rent for joints could vary on the amount of space used to encourage telecoms providers to make efficient use of the space available.⁴⁵⁰ The PAG suggested that a comprehensive review of network engineering rules is required and that such rules are documented to ensure equivalence between rules that apply to BT's network deployments and those of telecoms providers using PIA.⁴⁵¹

Connecting the customer

Overhead lead-ins

- A6.104 Virgin Media considered that we should assist potential users of PIA by clarifying that a telecoms provider is not required to negotiate its own wayleaves with third-party private landowners whose property is oversailed by the Openreach lead-in.⁴⁵²

⁴⁴⁴ Hyperoptic response to the 2016 PIA Consultation, page 13 and 14.

⁴⁴⁵ Openreach response to the 2016 PIA Consultation, page 39 and 40.

⁴⁴⁶ Openreach response to the 2016 PIA Consultation, page 40 and 41.

⁴⁴⁷ Openreach response to the 2016 PIA Consultation, page 43. Openreach's views regarding cost recovery is discussed in more detail in the cost recovery section at paragraphs A6.145 to A6.171.

⁴⁴⁸ Openreach response to the 2016 PIA Consultation, page 43.

⁴⁴⁹ Responses to the 2016 PIA Consultation from Virgin Media (page 9), Vodafone (page 28), the PAG, Hyperoptic (page 15), CityFibre (page 12) and Openreach (page 43)

⁴⁵⁰ Virgin response to the 2016 PIA Consultation, page 9.

⁴⁵¹ The PAG response to the 2016 PIA Consultation, page 43.

⁴⁵² Virgin Media response to the 2016 PIA Consultation, page 10.

- A6.105 Openreach argued that our dropwire proposals would form part of the construction of a new FTTP network and that we had failed to present evidence to support the imposition of a new access condition.⁴⁵³ Openreach said it faces the same constraints as other telecoms providers when providing its own FTTP services.⁴⁵⁴
- A6.106 In relation to whether a dropwire upgrade approach could be an effective and viable remedy, Virgin Media indicated that each telecoms provider may have different dropwire and fibre connector requirements. Virgin Media suggested that where Openreach upgrades the dropwire, the telecoms provider can choose a hybrid copper/blown fibre tube option in preference to a pre-connectorised hybrid copper/fibre cable since this would provide telecoms provider with additional choice and the improve the prospects of PIA being used.⁴⁵⁵ Flomatik also supported a hybrid copper/micro-tube solution (over a hybrid copper/fibre solution) since it considered that the hybrid copper/micro-tube solution would provide a more controlled solution, minimising disruption to customers and allowing Openreach to maintain control of its assets.⁴⁵⁶
- A6.107 CityFibre considered that a hybrid dropwire solution installed by the telecoms provider would be the most cost effective solution in allowing aerial FTTH/P networks to be constructed, as the telecoms provider would be able to build capacity at the top of the pole and effectively market the poles' capacity.⁴⁵⁷ Vodafone considered that we should not prescribe a single solution for overhead lead-ins but enable a range of options.⁴⁵⁸
- A6.108 While the PAG was broadly supportive of the proposed dropwire upgrade approach it also considered that significant further thinking would be required to ensure that it was fit for purpose.⁴⁵⁹ Hyperoptic also considered that the details of the approach would need to be considered in more detail and referred to the practical difficulties in "bringing fibre to each pole and placement of interconnection facility".⁴⁶⁰ CityFibre also highlighted that this was an area where the technical issues and encouraged us to take this issue forward as a separate area of technical investigation.⁴⁶¹
- A6.109 Openreach highlighted a number of challenges that would need to be addressed with the dropwire upgrade approach⁴⁶² and it did not agree with our proposal for it to replace dropwires on behalf of telecoms providers as a simple and low cost option where pole capacity is constrained. Openreach stressed that it has not seen any scale use of pole infrastructure and therefore experience of using this infrastructure is in its infancy. It remarked that there has not been any significant industry debate which has identified that an Openreach provided hybrid dropwire interconnected at a pole is the optimal technical solution.⁴⁶³

⁴⁵³ Openreach response to the 2016 PIA Consultation, page 44.

⁴⁵⁴ Openreach response to the 2016 PIA Consultation, page 44 and 45.

⁴⁵⁵ Virgin Media response to the 2016 PIA Consultation, page 10.

⁴⁵⁶ Flomatik response to the 2016 PIA Consultation, pages 3-4.

⁴⁵⁷ CityFibre response to the 2016 PIA Consultation, page 12.

⁴⁵⁸ Vodafone response to the 2016 PIA Consultation, page 29.

⁴⁵⁹ The PAG response to the 2016 PIA Consultation, page 44.

⁴⁶⁰ Hyperoptic response to the 2016 PIA Consultation, page 15.

⁴⁶¹ CityFibre response to the 2016 PIA Consultation, page 12.

⁴⁶² Openreach response to the 2016 PIA Consultation, page 48.

⁴⁶³ Openreach response to the 2016 PIA Consultation, page 44.

A6.110 Virgin Media argued that a dropwire upgrade approach should only apply where poles are capacity constrained.⁴⁶⁴ Openreach considered that there was not enough information or analysis available to recommend extending the proposal to all dropwire upgrades. It estimated that the extension of the remedy could expose Openreach to [\times] times the level of upgrades than a remedy based on poles at capacity.⁴⁶⁵ Whereas, the PAG considered that it would be more efficient to adopt the dropwire upgrade approach across all poles.⁴⁶⁶

Underground lead-ins

A6.111 Virgin Media considered that where there is no duct available or the duct is too small to accommodate an additional cable, the telecoms provider should deploy the infrastructure at its own cost and risk. Virgin Media considered that enabling works on lead-ins ducts that are blocked inside the customer's property boundary can be relatively simple to address for the telecoms provider whereas the enabling work that are needed on a highway or through third party property are more complicated and should mirror the enabling process in other parts of the network.⁴⁶⁷

A6.112 Openreach considered that duct lead-ins should be constructed and funded by the FTTP telecoms provider since this would enable telecoms providers to control both the timing and workflow at a suitable point in the connection process. In addition, it considered that network access rights should be reciprocal for lead-ins in these circumstances. Accordingly, other telecoms providers' lead-ins should allow for alternative provider access whereby the telecoms provider could provide an unbundling point close to the premises should Openreach, Virgin Media or another telecoms provider require it in future.⁴⁶⁸

A6.113 The PAG did not agree with our proposals regarding how duct lead-ins should be treated under PIA and argued that the same options proposed for overhead lead-ins should also apply to duct lead-ins. The PAG referred to the high cost of overbuilding unavailable underground lead-ins which may be prohibitive for many telecoms providers. It favoured the approach whereby Openreach would supply the lead-in and recover the costs over the long term and where lead-ins do not need to be removed (or sub-leased between many different telecoms providers) when the end customer churns away from the telecoms provider which initially deployed the network using PIA.⁴⁶⁹

A6.114 Hyperoptic was in broad agreement with our proposed treatment of underground lead-ins. Hyperoptic considered that in the case of direct buried lead-ins where there were no existing network chambers and ducts the cost of laying infrastructure down entire streets may quickly become unviable. In such cases, it argued that Openreach should lay new infrastructure (and recover the costs across all products).⁴⁷⁰

⁴⁶⁴ Virgin Media response to the 2016 PIA Consultation, page 13.

⁴⁶⁵ Openreach response to the 2016 PIA Consultation, pages 46-47.

⁴⁶⁶ The PAG response to the 2016 PIA Consultation, page 44.

⁴⁶⁷ Virgin Media response to the 2016 PIA Consultation, page 14.

⁴⁶⁸ Openreach response to the 2016 PIA Consultation, pages 48-49.

⁴⁶⁹ The PAG response to the 2016 PIA Consultation, page 45.

⁴⁷⁰ Hyperoptic response to the 2016 PIA Consultation, page 16.

Price regulation of PIA

Summary

- A6.115 Many stakeholders considered a charge control based on a cost model developed by Ofcom would be the most appropriate form of price regulation for rental charges. Other forms of price cap were also considered as acceptable, at least as an interim solution. Openreach and Virgin Media were the exception, and considered the current basis of charges condition as sufficient. In particular, Openreach argued that the potential benefits of imposing a charge control are limited while the risks are significant.
- A6.116 Stakeholders generally agreed that there are challenges in implementing a charge control however some believed these challenges can be overcome more rapidly than we considered in our 2016 PIA Consultation. With regards to the use of the current methodology as a basis for setting a charge control stakeholders' views varied.
- A6.117 In relation to ancillary charges, some stakeholders considered the current basis of charges condition acceptable, at least as a starting point. Others argued a charge control would be more appropriate. Openreach highlighted the risk of a charge control in distorting the 'build or buy' signals and suggested price regulation on comparable products serves as a benchmark for ancillary charges.

PIA rental prices

- A6.118 Stakeholders discussed the importance of long-term pricing stability in promoting infrastructure investment and some stakeholders pointed out the investment horizon for shared infrastructure ranged from 10 years to 20 years or more. TalkTalk⁴⁷¹ said that where a telecoms provider uses BT's duct and pole assets it would expect to use these for 20 years or more whilst [redacted].⁴⁷²

Appropriate form of regulation

Flexibility afforded under the current basis of charges condition

- A6.119 Openreach⁴⁷³ and Virgin Media⁴⁷⁴ considered the current basis of charges condition appropriate. Openreach argued that it has delivered stable pricing to date and can provide this going forward. Openreach went on to argue that pricing flexibility is needed for it to gradually adjust prices to reflect PIA take-up level and prevent steep price changes. Openreach and Virgin Media pointed out that we can intervene at any time if we consider that Openreach has abused its pricing flexibility, and Virgin Media suggested that the threat of our intervention prevents Openreach from engaging in such abuse.
- A6.120 However, most other stakeholders were concerned about the pricing flexibility afforded to Openreach and considered that the current regime does not provide

⁴⁷¹ TalkTalk response to the 2016 PIA Consultation, paragraph 5.8

⁴⁷² [redacted]

⁴⁷³ Openreach response to the 2016 PIA Consultation, paragraphs 269-270.

⁴⁷⁴ Virgin Media response to the 2016 PIA Consultation, pages 14-15.

them with sufficient pricing certainty. Three⁴⁷⁵ and Vodafone⁴⁷⁶ argued that Openreach has a strong incentive to exploit its pricing flexibility to dis-incentivise PIA take-up. Three⁴⁷⁷ argued that the absence of evidence of BT exploiting its flexibility in the past is due to the PIA product not being suitable for scale use, while it pointed to Openreach's history of exploiting its pricing flexibility for other regulated products, as evidenced by the Cost Allocation Review undertaken by ourselves. CityFibre⁴⁷⁸, [3<] ⁴⁷⁹ and Three⁴⁸⁰ noted the lengthy timeframes of the ex-post dispute mechanism make it an unattractive option to ensure Openreach's compliance.

A6.121 Openreach⁴⁸¹ and Virgin Media⁴⁸² noted that current PIA rental prices are broadly in line with international benchmarks. Virgin Media⁴⁸³ noted an absence of evidence that the ongoing pricing for PIA has thwarted its use, while CityFibre⁴⁸⁴ maintained the current rental charge levels are not an impediment to the use of DPA/PIA. Openreach⁴⁸⁵ pointed out that telecoms providers have not raised the current pricing level as a factor limiting their investment in fibre networks and that prices are cost-based.

A6.122 On the other hand, some stakeholders challenged the current pricing level. Three⁴⁸⁶ argued the low take-up of PIA suggests that the current pricing may not be competitive and the PAG⁴⁸⁷ argued the current pricing is neither appropriate nor in line with other countries, once the structure of charges (in particular the activities which attract ancillary charges) is taken into account. TalkTalk⁴⁸⁸ was concerned that pricing may be excessive because it is above incremental costs.

Challenges in developing a charge control model

A6.123 Many stakeholders expressed a preference for a charge control for rental prices but acknowledged the challenges in developing a charge control. However, some stakeholders believed that the challenges are overstated and can be overcome more rapidly. For example, the PAG⁴⁸⁹ suggested that lack of information in BT's regulatory accounting systems can be addressed by specific changes to BT's RFS, while Three⁴⁹⁰ suggested that there should already be a high degree of certainty around a significant proportion of the relevant cost base. Also, the PAG⁴⁹¹ noted that uncertainty about the precise level of take-up has not been a barrier for charge controlling dark fibre. GTC⁴⁹² highlighted the importance of imposing a charge

⁴⁷⁵ Three response to the 2016 PIA Consultation, paragraph 4.2.

⁴⁷⁶ Vodafone response to the 2016 PIA Consultation, paragraph 123.

⁴⁷⁷ Three response to the 2016 PIA Consultation, paragraph 4.2.

⁴⁷⁸ CityFibre response to the 2016 PIA Consultation, page 13.

⁴⁷⁹ [3<] response to the 2016 PIA Consultation, page 13.

⁴⁸⁰ Three response to the 2016 PIA Consultation, paragraph 4.3.

⁴⁸¹ Openreach response to the 2016 PIA Consultation, paragraph 269.

⁴⁸² Virgin Media response to the 2016 PIA Consultation, page 13.

⁴⁸³ Virgin Media response to the 2016 PIA Consultation, page 13.

⁴⁸⁴ CityFibre response to the 2016 PIA Consultation, pages 3 and 14.

⁴⁸⁵ Openreach response to the 2016 PIA Consultation, paragraph 299.

⁴⁸⁶ Three response to the 2016 PIA Consultation, page 14.

⁴⁸⁷ The PAG response to the 2016 PIA Consultation, paragraphs 6d and 85c.

⁴⁸⁸ TalkTalk response to the 2016 PIA Consultation, paragraph 4.7.

⁴⁸⁹ PAG response to the 2016 PIA Consultation, paragraphs 6d and 91b.

⁴⁹⁰ Three response to the 2016 PIA Consultation, page 14.

⁴⁹¹ PAG response to the 2016 PIA Consultation, paragraph 87a.

⁴⁹² GTC response to the 2016 PIA Consultation, page 13.

control based on our own modelling, arguing that telecoms providers face an asymmetry of information on Openreach's costs which is much more than ourselves. Vodafone⁴⁹³ argued that forecasting risks are outweighed by the significant benefits of a cost-based charge control.

- A6.124 On the other hand, Openreach⁴⁹⁴ argued that the potential benefits of imposing a charge control are limited while the risks are significant. Openreach considered a charge control may mean prices are at an artificially low level, which would stimulate unsustainable investment if prices need to subsequently readjust. Also, it considered that inappropriately low prices for PIA may restrict investment in alternative, economically viable technologies and markets. Similarly, CityFibre⁴⁹⁵ argued that pushing prices too far down will create "perverse incentives" for telecom providers' 'build or buy' decisions. Finally, Openreach⁴⁹⁶ pointed out that under a charge control any risk of cost increases or lack of cost recovery would be borne by Openreach alone. In addition, Virgin Media⁴⁹⁷ highlighted the uncertainty associated with many assumptions in a charge control model, and particularly the extent and timing of PIA take-up.

Using the current methodology as a basis for charge control

- A6.125 Stakeholders' views varied on this topic. Some were supportive, for example TalkTalk⁴⁹⁸ agreed the current methodology is appropriate (excluding productisation and processing costs) since it is considered reasonable and provides pricing stability. A similar view was expressed by Hyperoptic.⁴⁹⁹ CityFibre⁵⁰⁰ agreed that the current methodology, using LRIC+ of BT's own costs as a basis, is appropriate as a starting point. Openreach⁵⁰¹ warned that moving away from the current methodology or significantly altering its key assumptions may bring unintended consequences. Virgin Media⁵⁰² argued that moving from the current approach, to an interim methodology, before potentially adopting a more typical FAC-based approach does not provide a stable environment for investment.
- A6.126 Other stakeholders were more sceptical of using the current methodology. Three⁵⁰³ proposed we undertake our own cost modelling to verify how current prices correspond to FAC. Vodafone⁵⁰⁴ argued that the current methodology gives no pricing certainty for external PIA and may limit product take-up.
- A6.127 Turning to alternative approaches, CityFibre⁵⁰⁵ suggested that a cap with starting charges based on those that exist today is a pragmatic option, which does not preclude developing a more robust and transparent costing methodology in the

⁴⁹³ Vodafone response to the 2016 PIA Consultation, paragraph 117.

⁴⁹⁴ Openreach response to the 2016 PIA Consultation, paragraph 276-281.

⁴⁹⁵ CityFibre response to the 2016 PIA Consultation, page 3.

⁴⁹⁶ Openreach response to the 2016 PIA Consultation, paragraph 277.

⁴⁹⁷ Virgin Media response to the 2016 PIA Consultation, page 14.

⁴⁹⁸ TalkTalk response to the 2016 PIA Consultation, paragraph 4.9.

⁴⁹⁹ Hyperoptic response to the 2016 PIA Consultation, page 17.

⁵⁰⁰ CityFibre response to the 2016 PIA Consultation, page 14.

⁵⁰¹ Openreach response to the 2016 PIA Consultation, paragraphs 284-286.

⁵⁰² Virgin Media response to the 2016 PIA Consultation, page 15.

⁵⁰³ Three response to the 2016 PIA Consultation, page 14.

⁵⁰⁴ Vodafone response to the 2016 PIA Consultation, paragraph 122.

⁵⁰⁵ CityFibre response to the 2016 PIA Consultation, page 14.

future. Liquid Telecom⁵⁰⁶ proposed a rental price cap based on market-based prices and if possible international benchmarks for the rental of similar infrastructure.

Supplementing the current basis of charges condition with guidance

A6.128 Openreach⁵⁰⁷ believed that providing guidance alongside the current basis of charges condition is a pragmatic solution for the next review period. It also believed that guidance will have a practical effect even if not legally binding. Hyperoptic⁵⁰⁸ agreed with supplementing the basis of charges with guidance. GTC⁵⁰⁹ and Vodafone⁵¹⁰ agreed further guidance would be useful and would provide greater certainty on the principles to be applied however Vodafone went on to say it would not stop prices from rising.

A6.129 On the other hand, TalkTalk⁵¹¹ considered the current basis of charges too imprecise and guidance undesirable as it is uncertain to some degree. Three⁵¹² argued that non-binding guidance fails to provide the level of certainty required, for the same reasons as the current basis of charges obligation. CityFibre⁵¹³ noted that guidance cannot in any event bind any decision that we make on future disputes.

Alternative suggestions for providing a greater pricing certainty

A6.130 Openreach⁵¹⁴ proposed that the current basis of charges condition could be supplemented with a cap which limited the movement of prices from one year to the next. Similarly, GTC⁵¹⁵ proposed a “cap and collar” arrangement referenced to the relevant cost of living index to limit the extent to which charges could change.

A6.131 The PAG⁵¹⁶ argued that we should issue guidance on our long-term approach to PIA pricing, including principles for future market reviews, e.g. an indication that current prices represent a ‘ceiling’ for the future. Similarly, Liquid Telecom⁵¹⁷ suggested that the rental price cap set at the beginning of the review period should be considered the long-term maximum price, with an annual inflation (or volume) factor.

A6.132 Vodafone⁵¹⁸ suggested mandating long-term contracts, e.g. up to 25 years for the main network duct use and a variety of options for consumer lead-in facilities to align with the customer contract period or longer. Similarly, the Advisory Committee for Scotland⁵¹⁹ suggested a long-term charge based upon the current methodology at the time at which the service is ordered.

⁵⁰⁶ Liquid Telecom response to the 2016 PIA Consultation, page 8.

⁵⁰⁷ Openreach response to the 2016 PIA Consultation, paragraphs 289 and 292.

⁵⁰⁸ Hyperoptic response to the 2016 PIA Consultation, page 17.

⁵⁰⁹ GTC response to the 2016 PIA Consultation, page 14.

⁵¹⁰ Vodafone response to the 2016 PIA Consultation, paragraphs 123-124.

⁵¹¹ TalkTalk response to the 2016 PIA Consultation, paragraph 4.9.

⁵¹² Three response to the 2016 PIA Consultation, paragraph 4.4.

⁵¹³ CityFibre response to the 2016 PIA Consultation, page 14.

⁵¹⁴ Openreach response to the 2016 PIA Consultation, paragraph 300.

⁵¹⁵ GTC response to the 2016 PIA Consultation, page 14.

⁵¹⁶ The PAG response to the 2016 PIA Consultation, paragraph 92.

⁵¹⁷ Liquid Telecom response to the 2016 PIA Consultation, pages 8-9.

⁵¹⁸ Vodafone response to the 2016 PIA Consultation, paragraph 10-11.

⁵¹⁹ Advisory Committee for Scotland response to the 2016 PIA Consultation, page 3.

A6.133 Some stakeholders proposed a simplified structure of the PIA charges. CityFibre⁵²⁰ argued that the rental charges for duct should not depend on the number of bores, as this causes budgeting difficulties and is not indicative of the availability of spare capacity within those bores. Call Flow⁵²¹ argued that dropwire charges should not depend on the number of customers served, but on the space, loading or similar occupied.

Productisation costs

A6.134 On up-front costs, most stakeholders agreed these should be removed from PIA rental charges and spread across all users of physical infrastructure. TalkTalk argued that recovering the product and systems development costs from PIA may create a vicious circle, whereby high PIA prices reduce demand and justify higher PIA prices. It also argued that the customers of other products would benefit from PIA in time, therefore recovering fixed costs from other products that use duct is appropriate. Also, TalkTalk argued that if fixed costs are not included, PIA charges will be much less sensitive to PIA volumes.⁵²²

A6.135 Vodafone⁵²³ agreed that system costs should be recovered from all users including BT, and suggested that EMP should be the workflow interface for BT's external contractors, in-house staff as well as telecoms providers. Also, Vodafone⁵²⁴ argued that the current system is not equitable, as it allows BT to recover some costs across all users of the platform, while other user specific costs must be directly recovered from that user alone. Liquid Telecom⁵²⁵ agreed with our proposal, because it will create a non-discriminatory and transparent framework. CityFibre⁵²⁶ also agreed with our rationale for the apportionment of upfront costs and welcomed the specific reference to the Online Planning Tool costs. Hyperoptic⁵²⁷ also agreed that these costs should be reasonable and proportionate based on previously calculated methodology. Similarly, GTC⁵²⁸ agreed with our proposal, subject to consideration and transparency on the period over which such upfront costs will be recovered.

A6.136 On the other hand, Openreach⁵²⁹ and Virgin Media⁵³⁰ disagreed with our proposal and argued this runs contrary to the cost causation principle, gives incentives for inefficient and unsustainable entry, creates additional complexity and uncertainty, risks allocative inefficiency and incentivises unreasonable requirements on systems development.

A6.137 Turning to per-order costs, most stakeholders agreed these costs should be removed from PIA rental charges and recovered by spreading across all users of physical infrastructure. TalkTalk⁵³¹ argued that recovering per-order costs from a

⁵²⁰ CityFibre response to the 2016 PIA Consultation, pages 3 and 15.

⁵²¹ Call Flow response to the 2016 PIA Consultation, page 4.

⁵²² TalkTalk response to the 2016 PIA Consultation, paragraph 4.5.

⁵²³ Vodafone response to the 2016 PIA Consultation, paragraph 60.

⁵²⁴ Vodafone response to the 2016 PIA Consultation, paragraph 126.

⁵²⁵ Liquid Telecom response to the 2016 PIA Consultation, page 9.

⁵²⁶ CityFibre response to the 2016 PIA Consultation, page 15.

⁵²⁷ Hyperoptic response to the 2016 PIA Consultation, page 17.

⁵²⁸ GTC response to the 2016 PIA Consultation, page 14.

⁵²⁹ Openreach response to the 2016 PIA Consultation, paragraphs 303-312.

⁵³⁰ Virgin Media response to the 2016 PIA Consultation, pages 15-16.

⁵³¹ TalkTalk response to the 2016 PIA Consultation, paragraph 4.12.

PIA connection charge would eliminate the forecast risk concern. Vodafone⁵³² said that if per-order costs are included in the rental charge, as volumes increase, Openreach will likely over-recover these costs. Hyperoptic⁵³³ suggested that these costs should be reasonable and proportionate based on previously calculated methodology. Conversely, Openreach⁵³⁴ and Virgin Media⁵³⁵ disagreed with our proposal and said volume and take-up uncertainty can be readily addressed under the current regime.

Ancillary charges

- A6.138 A range of views has been put forward by stakeholders regarding ancillary charges. Some stakeholders found the current basis of charges condition appropriate, at least as a starting point. For example, [redacted]⁵³⁶ agreed that the current basis of charges is sufficient for regulating ancillary charges, while [redacted]⁵³⁷ argued that the current basis of charges condition is a sufficient starting point for regulating ancillary charges, subject to the potential changes to process, the move to self-provision and the potential removal of restrictions that Openreach currently charges for.
- A6.139 Other stakeholders considered ancillary charges should be subject to a charge control. CityFibre⁵³⁸ maintained that the uncertainty and unpredictability caused by ancillary charges is a further impediment to the large-scale use of PIA.
- A6.140 Openreach⁵³⁹ suggested that price regulation on comparable products serves as a benchmark for ancillary charges, e.g. Time Related Charges (TRCs) for the direct labour elements and Excess Construction Charges (ECCs) for the contractor elements. Openreach⁵⁴⁰ also highlighted the risk of a charge control distorting the 'build or buy' signals if prices of PIA ancillaries did not reflect actual changes to contractor rates.

Other issues raised by stakeholders

- A6.141 Several stakeholders proposed a more granular charging structure for duct, reflecting smaller diameters below the current 25mm increment. Hyperoptic⁵⁴¹ and [redacted]⁵⁴² believed that smaller increments would encourage more efficient duct space usage, while GTC⁵⁴³ noted that there are currently no commercial incentives for the telecoms provider to install a smaller sub-duct, blown cable or optical cable. Call Flow⁵⁴⁴ pointed out that using the full 25mm where less space is required would make it more difficult for a competing telecoms provider to use the remaining duct space. On the other hand, Openreach⁵⁴⁵ warned that reducing the price of duct rental below the 25mm equivalent allocation may prove unsustainable as a smaller

⁵³² Vodafone response to the 2016 PIA Consultation, paragraph 128.

⁵³³ Hyperoptic response to the 2016 PIA Consultation, page 17.

⁵³⁴ Openreach response to the 2016 PIA Consultation, paragraph 314.

⁵³⁵ Virgin Media response to the 2016 PIA Consultation, pages 2 and 16.

⁵³⁶ [redacted] response to the 2016 PIA Consultation, question 6.9.

⁵³⁷ [redacted] response to the 2016 PIA Consultation, page 14.

⁵³⁸ CityFibre response to the 2016 PIA Consultation, page 3.

⁵³⁹ Openreach response to the 2016 PIA Consultation, paragraph 323.

⁵⁴⁰ Openreach response to the 2016 PIA Consultation, paragraph 324.

⁵⁴¹ Hyperoptic response to the 2016 PIA Consultation, page 18.

⁵⁴² [redacted] response to the 2016 PIA Consultation, question 6.11.

⁵⁴³ GTC response to the 2016 PIA Consultation, pages 15-16.

⁵⁴⁴ Call Flow response to the 2016 PIA Consultation, pages 4-5.

⁵⁴⁵ Openreach response to the 2016 PIA Consultation, paragraph 285.

cable could replace all the existing copper cables in a duct and, as a result, Openreach would be unable to recover its full costs. Openreach noted this would require the duct access price to increase significantly.

- A6.142 On another matter, Call Flow⁵⁴⁶ suggested there should be a higher charge for aerial type cables that increase the loading on the pole and a much lower charge for cables that classify as drop cables. This would encourage telecoms providers to use minimum capacity and make it more likely that sufficient space will remain for competing telecoms providers and Openreach itself.
- A6.143 In their responses, Openreach⁵⁴⁷ and CityFibre⁵⁴⁸ discussed the risk of price arbitrage between PIA and active products. Openreach requested we undertake a full quantitative assessment of the potential impact, considering all proposals cumulatively and not in isolation, while CityFibre suggested various pricing structures that might reduce the incentives and opportunities for arbitrage.
- A6.144 Finally, [S&C]⁵⁴⁹ pointed out that bonds or holding company guarantees required from PIA users by Openreach can be as much of a disincentive to consumption as abusive pricing.

Cost recovery of infrastructure adjustments and systems development

Summary

- A6.145 Stakeholders were divided on our proposal that Openreach should recover the cost of adjustments from all products that use BT's physical infrastructure.
- A6.146 Arguments in favour of our proposed approach included that:
- it would facilitate competitive fibre deployment;
 - it would provide Openreach with the incentive to minimise costs; and
 - some of the adjustments would be required irrespective of rollout by PIA users.
- A6.147 Most of the arguments against our proposed approach were made by Openreach, and to a lesser extent, Virgin Media. These included that:
- our proposal would promote inefficient entry as telecoms providers would not face the full costs of rolling out FTTP;
 - our proposal would not ensure equivalence, rather, it would put Openreach at a disadvantage as Openreach would take the costs of any network adjustments into account when deciding whether to deploy a network unlike other telecoms providers using PIA;

⁵⁴⁶ Call Flow response to the 2016 PIA Consultation, page 5.

⁵⁴⁷ Openreach response to the 2016 PIA Consultation, paragraph 328.

⁵⁴⁸ CityFibre response to the 2016 PIA Consultation, page 17.

⁵⁴⁹ [S&C] response to the 2016 PIA Consultation, page 14.

- our proposal would transfer substantial additional costs and risk on to Openreach which it would not be able to control, and would also impact on Openreach's ability to invest in its own infrastructure projects;
- our proposal could result in significant price increases, with customers in rural areas paying for improved infrastructure in selected urban areas which they are unlikely to benefit from; and
- our proposal requires Openreach to charge higher prices, undermining its ability to compete with Virgin Media.

A6.148 Turning to systems development, most stakeholders agreed with our proposal that systems development costs should be recovered over users of the infrastructure. Openreach and Virgin Media disagreed.

Cost recovery of infrastructure adjustments

Efficiency

A6.149 Openreach argued that our proposal would promote inefficient entry and that telecoms providers "will have no incentive to make efficient and sound investments when the up-front build costs have been removed from their business case."⁵⁵⁰ It also referred to this as a moral hazard problem where "one party triggers a risk on the basis that it will benefit from the up-side return but is protected against the down-side risk as another party will incur the costs".⁵⁵¹ Openreach argued that if imposed, the lack of incentives for other telecoms providers to seek cost effective locations could "result in fewer premises being served with FTTP than by a more commercial use of the funds."⁵⁵² Similarly, Openreach argued that telecoms providers would not have an incentive to minimise their requests for adjustments.⁵⁵³

A6.150 Openreach also considered that any other value in making adjustments was hypothetical. For example, it suggested further FTTP rollout was unlikely and that where duct is collapsed or blocked, this may not impact services in which case it would not need to be repaired to maintain existing services.⁵⁵⁴

A6.151 Similarly, CityFibre suggested in relation to the construction of new duct our proposal "would likely encourage economically inefficient behaviour as OCPs [telecoms providers] causing such substantial costs to be incurred would bear no specific consequence of that request". CityFibre expanded on this by arguing that it would "cause a significant distortion of make or buy signals for OCPs, encouraging complete dependence on BT Openreach".⁵⁵⁵

A6.152 Virgin Media also specifically addressed this issue by arguing that we need to "avoid interfering with efficient investment signals through the design of PIA."⁵⁵⁶

⁵⁵⁰ Openreach response to the 2016 PIA Consultation, page 34.

⁵⁵¹ Openreach response to the 2016 PIA Consultation, page 47.

⁵⁵² Openreach response to the 2016 PIA Consultation, page 21.

⁵⁵³ Openreach response to the 2016 PIA Consultation, page 36.

⁵⁵⁴ Openreach response to the 2016 PIA Consultation, page 38.

⁵⁵⁵ CityFibre response to the 2016 PIA Consultation, page 4.

⁵⁵⁶ Virgin Media response to the 2016 PIA Consultation, page 2.

- A6.153 TalkTalk was of the view that although “the approach of BT bearing the enabling costs also creates strong cost minimisation incentives on Openreach,”⁵⁵⁷ it “may encourage inefficient expenditure since the CP requesting the enablement work does not pay for it.” However, it suggested that this could “be addressed by imposing a minimum use period during which the CP must pay rental.”⁵⁵⁸
- A6.154 Call Flow argued that where poles were waiting to be replaced as part of Openreach’s pole renewal programme, the cost passed to telecoms providers “should effectively be at nil, or near nil...as the pole has already been identified as needing replacement”.⁵⁵⁹

Equivalence

- A6.155 Openreach challenged our view that Openreach recovering costs over the infrastructure would lead to equivalence between BT and other telecoms providers. It said that in contrast, “Openreach investment decisions are based on actual cashflows”⁵⁶⁰ and that when investing in FTTP it “has to find the cashflow to fund its own network build and face the consequential risks.”⁵⁶¹ Furthermore, it said that “the fact...Openreach capitalises costs does not mean that it somehow escapes facing upfront costs.”⁵⁶² It argued that our proposal would lead to other telecoms providers having “a lower cash investment than would Openreach for the same project.”⁵⁶³
- A6.156 Openreach proposed that adjusting the cost allocations in their regulated accounts would be a more appropriate method to ensure that “PIA should have equivalent incremental infrastructure costs.”⁵⁶⁴
- A6.157 Similarly, Virgin Media said that we “apply a partial view of equivalence”⁵⁶⁵ because if Openreach “decides to expand its FTTP program the costs of enabling works (and adding capacity) would form part of its business plan.”⁵⁶⁶ It argued that “CPs should not be put at an advantage to BT, and in Ofcom’s proposed treatment of some costs, this may be the case.”⁵⁶⁷

Risk on Openreach

- A6.158 Openreach disagreed with our proposal on cost recovery on the basis that BT would be “effectively taking on all the risk on behalf of third parties.”⁵⁶⁸ It argued that increasing the costs it recovers over the infrastructure would distort competition by making Openreach products less competitive. For example, it said that “Openreach’s charges will all be increased by the additional cost while Virgin Media’s customer charges will not,” and that “this problem could be further exacerbated where, for example, Virgin Media could consume PIA as a more cost

⁵⁵⁷ TalkTalk response to the 2016 PIA Consultation, paragraph 2.5.

⁵⁵⁸ TalkTalk response to the 2016 PIA Consultation, paragraph 4.4.

⁵⁵⁹ Call Flow response to the 2016 PIA Consultation, page 3, question 5.14.

⁵⁶⁰ Openreach response to the 2016 PIA Consultation, paragraph 88.

⁵⁶¹ Openreach response to the 2016 PIA Consultation, paragraph 89.

⁵⁶² Openreach response to the 2016 PIA Consultation, paragraph 184.

⁵⁶³ Openreach response to the 2016 PIA Consultation, paragraph 88.

⁵⁶⁴ Openreach response to the 2016 PIA Consultation, paragraph 88.

⁵⁶⁵ Virgin Media response to the 2016 PIA Consultation, pages 1-2.

⁵⁶⁶ Virgin Media response to the 2016 PIA Consultation, page 9.

⁵⁶⁷ Virgin Media response to the 2016 PIA Consultation, page 3.

⁵⁶⁸ Openreach response to the 2016 PIA Consultation, paragraph 166.

effective solution to building their own network particularly as some of the costs would be borne by Openreach.”⁵⁶⁹

- A6.159 Furthermore, Openreach argued that the proposal would impair its ability to control costs and that “Openreach cannot be expected to have in place an open-ended CP infrastructure budget.” It said that if we proceed with the proposal “then at a minimum Ofcom should also propose an associated ceiling on total costs which Openreach is expected to meet in any year.”⁵⁷⁰ It said that “provision of extra duct can be very expensive, especially in built-up areas where a short section of duct can cost in the region of £50-100 per metre as well as involving significant disruption due to the required road closures.”⁵⁷¹
- A6.160 Openreach also argued that there was a risk it would be unable to recover those costs and could be left with stranded assets. It said “for accounting purposes, duct is assumed to have an economic life of 40 years. However, it is not known for certain that in even 10 or 20 years' time that NGA networks will continue to be based on existing fixed line technologies.”⁵⁷² Lastly, Openreach argued that its capital is limited and our proposal would reduce “the capital available for Openreach to invest in its own fibre network or other products.”⁵⁷³

Distributional effects

- A6.161 Openreach, CityFibre and Sky argued that because Openreach would increase its prices if it had to recover the cost of adjustments, our proposal would have a negative impact on telecoms providers that do not use PIA and on those customers who would not benefit from network competition.
- A6.162 CityFibre argued that our proposal would cause those telecoms providers “which build their own civil infrastructure where BT’s is not available to cross-subsidise those which simply wait for BT to do so.”⁵⁷⁴
- A6.163 Sky expressed a desire for us to use caution when considering how to recover costs, and suggested that costs could be controlled by “ensuring that additional common costs are not excessive, and that CPs that do not use DPA do not face disproportionate price increases ... Sky proposes a use it or pay for it approach to limit CPs from asking for extensive duct work that they cannot subsequently use.” It also suggested that costs should be “recovered from fibre based products, ensuring that consumers acquiring copper-based services are not affected by investments facilitating the provision of fibre-based products.”⁵⁷⁵
- A6.164 Openreach said that it would cause “rural customers using copper access lines to effectively pay a levy”⁵⁷⁶ and that these customers would “end up contributing to the unlimited duct build costs for a third (or fourth etc.) ultrafast network in a densely populated area.”⁵⁷⁷

⁵⁶⁹ Openreach response to the 2016 PIA Consultation, paragraphs 96 and 97.

⁵⁷⁰ Openreach response to the 2016 PIA Consultation, paragraph 199.

⁵⁷¹ Openreach response to the 2016 PIA Consultation, paragraph 179.

⁵⁷² Openreach response to the 2016 PIA Consultation, paragraph 182.

⁵⁷³ Openreach response to the 2016 PIA Consultation, paragraph 91.

⁵⁷⁴ CityFibre response to the 2016 PIA Consultation, page 4.

⁵⁷⁵ Sky response to the 2016 PIA Consultation, paragraphs 39 and 40.

⁵⁷⁶ Openreach response to the 2016 PIA Consultation, paragraph 19.

⁵⁷⁷ Openreach response to the 2016 PIA Consultation, paragraph 172.

Other comments raised by stakeholders

- A6.165 Vodafone, which agreed with our proposal, said that “enablement works (repairs and new capacity) for BT’s ducts should fall upon BT, and not be borne solely or directly by the CP,” including works carried out by the telecoms provider. It said that in this case the works “subsequently become part of the Openreach’s asset base, which is the recovered through regulated charges.”⁵⁷⁸ Also in favour of our proposals, [3<] said that Openreach should bear the maintenance costs of its assets.
- A6.166 CityFibre suggested that where construction is necessary, Openreach should be able to charge the full cost to the telecoms provider, but to avoid over-recovery by BT, the ECC should be offset against BT’s overall duct and pole costs. However, in relation to costs incurred in making Openreach’s existing duct and pole infrastructure suitable for third party access or general repairs, it agreed with our cost recovery principle.⁵⁷⁹
- A6.167 Finally, Openreach suggested that our proposals in relation to cost recovery were incompatible with a number of broader principles enshrined in the Communications Act, the EU Access Directive and the EU Framework.⁵⁸⁰ In addition, Openreach argued that our approach would not follow the bottom-up LRIC+ costing methodology to be applied to NGA networks as recommended by the European Commission.⁵⁸¹

Cost recovery of systems development costs

- A6.168 Most stakeholders agreed with our proposal that systems development costs should be recovered over users of the infrastructure. Openreach and Virgin Media disagreed.
- A6.169 TalkTalk said there are “a number of fixed costs that will be incurred to make PIA effective – for instance: product development and system development,” and that if these were recovered from PIA users “PIA may never get off the ground.”⁵⁸² In addition, GTC suggested that systems for PIA use “will have a longer life than five years” and as such could be recovered over a longer period.⁵⁸³
- A6.170 On the other hand, Openreach and Virgin Media argued our proposal departed from the principle of cost causality as non-PIA telecoms providers were unlikely to benefit from those tools. In particular, Openreach pointed to the systems developments that are exclusive to PIA ordering and billing⁵⁸⁴ and Virgin Media argued that our proposed approach was inconsistent with our review of BT’s cost attribution methodologies for its FAC RFS, which said that BT’s approach was not sufficiently causal.⁵⁸⁵
- A6.171 Openreach said it has the incentive to deliver efficient systems and that the alternative approach could risk incentivising telecoms providers “to request greater

⁵⁷⁸ Vodafone response to the 2016 PIA Consultation, pages 12 and 28.

⁵⁷⁹ CityFibre response to the 2016 PIA Consultation, page 4.

⁵⁸⁰ Openreach response to the 2016 PIA Consultation, paragraph 169.

⁵⁸¹ Openreach response to the 2016 PIA Consultation, paragraph 190.

⁵⁸² TalkTalk response to the 2016 PIA Consultation, page 12.

⁵⁸³ GTC response to the 2016 PIA Consultation, page 13, question 6.3.

⁵⁸⁴ Openreach response to the 2016 PIA Consultation, paragraph 310.

⁵⁸⁵ Virgin Media response to the 2016 PIA Consultation, page 16.

levels of system development that may be necessary without any cost impact on their product pricing and business case.”⁵⁸⁶ Openreach also argued that it had already incurred significant costs to set up the PIA service and operate it for the past five years; that Ofcom had previously implicitly supported that directly incurred PIA related costs could be recovered through PIA pricing; and that the costs of developing PIA systems are lower because of the “significant levels of investment that Openreach has already made into its inventory tools.”⁵⁸⁷

⁵⁸⁶ Openreach response to the 2016 PIA Consultation, paragraph 154.

⁵⁸⁷ Openreach response to the 2016 PIA Consultation, paragraphs 151 and 152.

Annex 7

Glossary

4G: Fourth generation of mobile telephony systems, including the LTE technology standard.

5G: Fifth generation of mobile telephony systems.

Access Network: The part of a telecoms provider's network that connects customers' premises to the telecoms provider's Local Access Node.

Additional Financial Information (AFIs): Detailed financial information provided in confidence to Ofcom as part of the Regulatory Financial Statements.

Ancillary Services: Services that are of an ancillary nature, but which enable and/or support BT's provision of Physical Infrastructure Access services

Access To Infrastructure (ATI) Regulations: The Communications (Access to Infrastructure) Regulations 2016. The ATI Regulations transpose into UK law the Broadband Cost Reduction Directive 2014.

Bandwidth: The amount of data that can be transmitted in a fixed amount of time. Usually expressed in bits per second (bps).

BCMR: Business Connectivity Market Review.

BDOUK: Broadband Delivery UK.

BEREC: Body of European Regulators for Electronic Communications.

BT Wholesale & Ventures: The division of BT which provides wholesale services to communications providers.

CAT: Competition Appeal Tribunal.

Chamber: A underground structure at which ducts terminate. Used for cable pulling and cable jointing.

Charge Control: A control which sets the maximum price that a telecoms provider can charge for a particular product or service. Most charge controls are imposed for a defined period.

CMR: Ofcom's Communications Market Reports.

Co-location: The provision of space at a BT MDF site that enables a competing provider to locate equipment within that MDF site in order to connect to the dominant provider and purchase LLU services.

Co-mingling Services: All essential support services which are used by SMPF and/or MPF, including the co-location services (e.g. electricity, ventilation).

Common Costs: Costs which are shared by all the services supplied by a firm.

Connected Nations Report: An annual report published by Ofcom on the availability and quality of broadband across the UK.

Consumer Price Index (CPI): The official measure of inflation of consumer prices in the United Kingdom.

Core Network: The backbone of a communications network, which carries different services such as voice or data around the country.

Cost Orientation: The principle that the price charged for the provision of a service should reflect the underlying costs incurred in providing that service.

Data Over Cable Service Interface Specification (DOCSIS): An international telecommunications standard that permits the addition of high-bandwidth data transfer to an existing cable TV system.

DCMS: Department of Culture, Media and Sport.

Digital Communications Review (DCR): Also referred to as the Strategic Review of Digital Communications, the DCR is a document Ofcom published in February 2016 which set out a ten-year vision for communications services in the UK.

Distributed Long Run Incremental Cost (DLRIC): The LRIC of the individual service with a share of some costs which are common to other services over BT's core network.

Distributed Stand Alone Cost (DSAC): An accounting approach estimated by adding to the DLRIC a proportionate share of the inter-increment common costs. Rather than all common costs shared by a service being allocated to the service under consideration, the common costs are instead allocated among all the services that share the network increment.

Distribution Point (DP): A flexibility point in BT's access network where final connections to customer premises are connected to D-side cables. Usually either an underground joint or a connection point on a telegraph pole where dropwires are terminated.

Downstream BT: BT's downstream operations, by which we mean BT Wholesale & Ventures, BT Consumer or any other downstream operation owned or operated by BT.

Dropwire: An overhead cable, connecting BT's access network to a customer's premise.

Duct and Pole Access (DPA): A wholesale access service allowing a telecoms provider to make use of the underground duct network and the telegraph poles of another telecoms provider.

EC: European Commission.

EMP (Equivalence Management Platform): BT's operation support system designed to handle the majority of transactions for equivalence of inputs and network access.

Equivalence of Inputs (EOI): A remedy designed to prevent a vertically-integrated company from discriminating between its competitors and its own business in providing upstream inputs. This requires BT to provide the same wholesale products to all telecoms providers including BT's own downstream division on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes, and includes the provision to all telecoms providers (including BT) of the same commercial information about such products, services, systems and processes.

Equivalence of Outputs (EEO): A remedy which requires the provision of all wholesale inputs to access seekers in a manner which is comparable, in terms of functionality and price, to those the SMP operator provides to its own downstream businesses, although different systems and processes may be used so long as this does not create a material difference in the service offered.

Ethernet: A packet-based technology originally developed for use in Local Area Networks (LANs) but now also widely used in telecoms providers' networks for the transmission of data services.

Ethernet Access Direct (EAD): A wholesale BT product providing point-to-point data connectivity between sites, available at a range of different speeds.

FAMR: Fixed Access Market Review.

Fibre To The Cabinet (FTTC): An access network structure in which the optical fibre extends from the exchange to a street cabinet. The street cabinet is usually located only a few hundred metres from the subscriber's premises. The remaining part of the access network from the cabinet to the customer is usually copper wire but could use another technology, such as wireless.

Fibre To The Premises (FTTP): An access network structure in which the optical fibre network runs from the local exchange to the end user's house or business premises. The optical fibre may be point-to-point – there is one dedicated fibre connection for each home – or may use a shared infrastructure such as a GPON. Sometimes also referred to as Fibre to the home (FTTH), or full-fibre.

Fixed wireless: An access service where the connection between the network and the equipment located at the customer premises is provided over the radio access medium.

Footway box: A underground chamber in the footway used as a point for access to duct or cables to the premises and BT's physical infrastructure

Fully Allocated Cost (FAC): An accounting approach under which all the costs of the company are distributed between its various products and services. The fully allocated cost of a product or service may therefore include some common costs that are not directly attributable to the service.

G.fast: A broadband transmission standard that increases the speeds possible over short distances on copper lines, compared to ADSL and VDSL technologies.

Generic Ethernet Access (GEA): BT's wholesale product providing telecoms providers with access to BT's FTTC and FTTP networks in order to supply higher speed broadband products. BT currently meets its obligation to provide VULA using the GEA service.

GIS: Geographic Information System

Gigabit Passive Optical Network (GPON): A passive Optical Network standard defined by the International Telecommunications Union (standard G.984). GPON has a downstream bandwidth of 2.5Gbit/s and an upstream bandwidth of 1.2Gbit/s.

Hull Area: The area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under Section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc (KCOM).

Lead-in: The final connection between a telecoms provider's Access Network and a customer's premises.

Leased Line: A permanently connected communications link between two premises dedicated to the customer's exclusive use.

Local Access Node: An operational building at which local access network connections are terminated; generally the operational building housing the optical distribution frame on which the fibre access network serving Network Termination Points is located.

Local Loop: The access network connection between the customer's premises and the local serving exchange, usually comprised of two copper wires twisted together.

Local Loop Unbundling (LLU): A process by which a dominant provider's local loops are physically disconnected from its network and connected to a competing provider's networks. This enables operators other than the incumbent to use the local loop to provide services directly to customers.

Long Reach VDSL (LR-VDSL): LR-VDSL uses VDSL technology but makes use of the frequency ranges assigned to both ADSL and VDSL, and utilises higher signal power. LR-VDSL also uses vectoring to minimise the impact of cross-talk and interference, which would otherwise reduce the speed available to customers.

Long Run Incremental Cost (LRIC): A measure of the change in total costs of the firm that arises from a discrete increment in output in the long run.

LRIC+: Long run incremental costs plus a share of common costs.

Main Distribution Frame (MDF): An internal wiring frame where local loops are terminated and cross connected to exchange equipment by flexible wire jumpers.

Metallic Path Facilities (MPF): The provision of access to the copper wires from the customer premises to a BT MDF that covers the full available frequency range, including both narrowband and broadband channels, allowing a competing provider to provide the customer with both voice and/or data services over such copper wires.

Minimum Contract Period: The amount of time a telecoms provider or consumer must remain in a contract before being able to cancel it.

Network Termination Point: a demarcation point marking where a telecoms providers network terminates at a customer's premises.

Next Generation Access (NGA) Networks: Wired access networks which consist wholly or in part of optical elements and which are capable of delivering broadband access services with enhanced characteristics (such as higher throughput) as compared to those provided over copper networks. In most cases, NGA networks are the result of an upgrade of an already existing copper or co-axial access network.

NRA: National Regulatory Authority.

Ofcom: The Office of Communications.

Office of the Telecommunications Adjudicator (OTA2): An independent body that facilitates discussion between telecoms providers on operational issues related to new and existing telecoms products and services.

ONS: The Office of National Statistics.

Openreach: The access division of BT established by Undertakings in 2005.

Optical Local Exchange: A BT Local Exchange from which optical services are provided.

Passive Optical Network (PON): A fibre access network that uses unpowered (passive) optical splitters to create a point-to-multipoint architecture such that individual fibres in spine segments of the network are shared by multiple end users.

Physical Infrastructure Access (PIA): A regulatory obligation under which BT is required to allow telecoms providers to deploy NGA networks in the physical infrastructure of its access network.

Reference Offer: A document setting out matters relating to the charges, terms and conditions of a product or service.

Regulatory Financial Statements (RFS): The financial statements that BT is required to prepare by Ofcom. They include the published RFS and Additional Financial Information provided to Ofcom in confidence.

Return On Capital Employed (ROCE): The ratio of accounting profit to capital employed.

Service Level Agreement (SLA): A contractual commitment provided by Openreach to telecoms providers about service standards.

Service Level Guarantee (SLG): A contractual commitment by Openreach to telecoms providers specifying the amount of compensation payable by Openreach to a telecoms provider for a failure to adhere to an SLA.

Service Management Centre (SMC): The contact point in Openreach for telecoms providers requesting LLU, WLR and other services.

Significant Market Power (SMP): The significant market power test is set out in European Directives. It is used by National Regulatory Authorities (NRAs), such as Ofcom, to identify those telecoms providers which must meet additional obligations under the relevant Directives.

SME: Small and medium sized enterprises are businesses with 249 or fewer employees.

Sub-Loop Unbundling (SLU): Like local loop unbundling (LLU), except that telecoms providers interconnect at a point between the exchange and the end user, usually at the cabinet.

Superfast Broadband: A broadband connection that can support a maximum download speed of between 30Mbit/s and 300Mbit/s.

SG&A: Sales, general and administration costs

Telecoms provider: A person who provides an electronic communications network or provides an electronic communications service.

The Act: The Communications Act 2003.

Time-Related Charges (TRCs): Time Related Charges are raised by Openreach to recover costs incurred when Openreach engineers perform work not covered under the terms of the Openreach standard service.

Ultrafast Broadband: Ofcom currently defines ultrafast as broadband services which deliver download speeds greater than 300Mbit/s, which use technology capable of supporting speeds of 1 Gbit/s and above. Furthermore, these services do not have the unpredictable 'up to' speed limitations of copper-based broadband services, offering greater reliability.

Virtual Unbundled Local Access (VULA): Provides access to BT's FTTC and FTTP network deployments. Telecoms providers connect to the VULA service at a 'local' aggregation point and are provided a virtual connection from this point to the customer premises.

Wholesale Line Rental (WLR): The service offered by Openreach to other telecoms providers to enable them to offer retail line rental services in competition with BT's own retail services.

Wholesale Local Access (WLA): The market that covers fixed telecommunications infrastructure, specifically the physical connection between customers' premises and a local exchange.

Annex 8

Draft legal instruments

Proposals for SMP services conditions

NOTIFICATION OF PROPOSALS UNDER SECTION 48A OF THE COMMUNICATIONS ACT 2003

Proposals for setting SMP services conditions in relation to BT under section 45 of the Communications Act 2003

Background

1. On 31 March 2017, Ofcom published a statement entitled “*Wholesale Local Access Market Review 2017*”⁵⁸⁸ (the “**2017 WLA Consultation**”). The 2017 WLA Consultation set out Ofcom’s proposals to identify the market for the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom excluding the Hull Area for the purpose of making a determination that BT has significant market power in relation to that identified market. As a result of this proposed significant market power determination, Ofcom proposed to set SMP conditions on BT under section 45 of the Act.
2. The proposed market power determination and the proposed SMP condition are set out in the notification under sections 48A and 80A of the Act, at Annex 23 of the 2017 WLA Consultation (the “**March 2017 Notification**”).
3. The March 2017 Notification stated that Ofcom’s proposals in relation to duct and pole access would be set out in a separate notification under section 48A of the Act.

Proposals in relation to duct and pole access

4. With reference to the proposals in the March 2017 Notification, Ofcom is proposing to set, in relation to the market identified in paragraph 1 above, the SMP conditions as set out in Schedule to this notification to be applied to BT to the extent specified in that Schedule, which SMP conditions shall, unless otherwise is stated in that Schedule, take effect from 1 April 2018 or such other date specified in any notification under sections

⁵⁸⁸ <https://www.ofcom.org.uk/consultations-and-statements/category-1/wholesale-local-access-market-review>

48(1) and 79(4) of the Act adopting the proposals set out in this Notification. The Schedule indicates in red and bold the modifications Ofcom is proposing to make to the SMP conditions proposed in the March 2017 Notification. The modified SMP conditions comprise Ofcom's proposals relating to duct and pole access in the market identified in paragraph 1 above.

5. In the March 2017 Notification, Ofcom is proposing to revoke the SMP conditions applied to BT as set out in the 2014 FAMR Notification, including those SMP conditions in that notification relating to duct and pole access.

PIA Charge Controls

6. Ofcom's proposals in relation to physical infrastructure access pricing and regulatory financial reporting will be contained in a further consultation document and SMP conditions will be contained in a separate notification under section 48A of the Act.

Ofcom's duties and legal tests

7. The effect of, and Ofcom's reasons for making, the proposals in relation to SMP conditions referred to in this notification are set out in the consultation document accompanying this notification.
8. Ofcom considers that the proposed SMP conditions comply with the requirements of sections 45 to 47 and 87 of the Act, as appropriate and relevant to each such SMP condition.
9. In making all of the proposals referred to in this notification, Ofcom has considered and acted in accordance with its general duties set out in section 3 of the Act and the six Community requirements in section 4 of the Act. In accordance with section 4A of the Act, Ofcom has also taken due account of all applicable recommendations issued by the European Commission under Article 19(1) of the Framework Directive and the utmost account of any relevant opinion, recommendation, guidelines, advice or regulatory practice adopted by the Body of European Regulators for Electronic Communications (BEREC pursuant to Article 3(3) of Regulation (EC) No 1211/2009).

Making representations

10. Representations may be made to Ofcom about any of the proposals set out in this Notification and the accompanying consultation document by no later than 15 June 2017.
11. Copies of this notification and the accompanying consultation document will be sent to the Secretary of State in accordance with section 48C(1) of the Act.

Interpretation

12. For the purpose of interpreting this notification (which for the avoidance of doubt includes the Schedule):
 - a) except in so far as the context otherwise requires, words or expressions have the meaning assigned to them in paragraph 13 below, and otherwise any word or expression has the same meaning as it has in the Act;
 - b) headings and titles shall be disregarded;
 - c) expressions cognate with those referred to in this Notification shall be construed accordingly; and
 - d) the Interpretation Act 1978 shall apply as if this Notification were an Act of Parliament.
13. In this Notification:
 - (a) “**2017 WLA Consultation**” means the notification described in paragraph 1 above;
 - (b) “**2014 FAMR Notification**” means the notification modifying and revoking certain SMP services conditions previously imposed set out in Annex 29 to the statement entitled “*Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30 Volume 1: Statement on the markets, market power determinations and remedies and Fixed access market reviews: wholesale local access, wholesale fixed analogue exchange lines, ISDN2 and ISDN30: Volume 2: LLU and WLR Charge Controls*”, dated 26 June 2014
 - (c) “**March 2017 Notification**” means the statements described in paragraph 2 above;

- (d) **“Act”** means the Communications Act 2003 (2003 c. 21);
- (e) **“BT”** means British Telecommunications plc, whose registered company number is 1800000, and any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined by section 1159 of the Companies Act 2006;
- (f) **“Framework Directive”** means Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services, as amended;
- (g) **“Hull Area”** means the area defined as the 'Licensed Area' in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communication (Hull) plc, (now known as KCOM);
- (h) **“Ofcom”** means the Office of Communications as established pursuant to section 1(1) of the Office of Communications Act 2002 (2002 c. 11);
- (i) **“United Kingdom”** has the meaning given to it in the Interpretation Act 1978 (1978 c. 30).

21. The Schedule to this notification shall form part of this notification.

Signed



Yih-Choung Teh

Competition Policy Director, Ofcom

A person duly authorised in accordance with paragraph 18 of the Schedule to the Office of Communications Act 2002

20 April 2017

Schedule 1: SMP conditions (BT)

Part 1: Application

1. The SMP conditions in Part 3 of this Schedule 1, except where specified otherwise, apply to the Dominant Provider in the supply of copper loop-based, cable-based and fibre-based wholesale local access at a fixed location in the United Kingdom excluding the Hull Area. Save as otherwise specified in any condition, each condition will enter into force on the date of publication of this notification and shall have effect until the publication of a notification under section 48(1) of the Act revoking such conditions.
2. The conditions referred to in paragraph 1 above are entitled as follows—

Condition 1	Network access on reasonable request
Condition 2	Specific forms of network access
Condition 3	Requests for new forms of network access
Condition 4	No undue discrimination
Condition 5	Equivalence of Inputs basis
Condition 6	Basis of charges
Condition 7	Charge controls
Condition 8	Publication of a Reference Offer
Condition 9	Notification of charges and terms and conditions
Condition 10	Notification of technical information
Condition 11	Quality of service
Condition 12	Regulatory Financial Reporting

Part 2: Interpretation

1. In addition to the definitions set out above in this notification and in each condition below (where relevant), in this Schedule 1—
 - a) “**Access Agreement**” means an agreement entered into between the Dominant Provider and a Third Party for the provision of network access in accordance with condition 1 and, in relevant cases, condition 2;
 - b) “**Dominant Provider**” means BT;
 - c) “**Charge**” means the charge (being in all cases the amounts offered or charged by the Dominant Provider), excluding any discounts offered by the Dominant Provider, to a communications provider for the Charge Controlled Service”;
 - d) “**Consumer Prices Index**” means the index of prices compiled by an agency or a public body on behalf of Her Majesty’s Government or a governmental department (which is the Office for National Statistics at the time of publication of this Notification) from time to time in respect of all items;
 - e) “**CPI**” means the amount of the change in the Consumer Prices Index in the period of twelve months ending on 31 October immediately before the beginning of the Relevant Year, expressed as a percentage (rounded to one decimal place) of that Consumer Prices Index as at the beginning of that first mentioned period;
 - f) “**First Relevant Year**” means the period of 12 months beginning on 1 April 2018 and ending on 31 March 2019;
 - g) “**FTTC**” means Fibre-to-the-Cabinet, an Electronic Communications Network consisting of optical fibre extending from the local access node to the street cabinet;

- h) **“FTTP”** means Fibre-to-the-Premises, an Electronic Communications Network consisting of optical fibre extending from the local access node to the customer’s premises;
- i) **“GEA”** means Generic Ethernet Access, the BT non-physical wholesale services providing wholesale access to higher speed broadband products;
- j) **“GEA – FTTC”** means BT’s product consisting in the provision of GEA services via its FTTC network;
- k) **“GEA – FTTP”** means Virtual Unbundled Local Access provided through BT’s GEA services over its FTTP network;
- l) **“Local Loop Unbundling Services”** means network access to Metallic Path Facilities or Shared Access;
- m) **“Local Access Node” means either:**
- i. an MDF Site;**
 - ii. an ODF Site;**
 - iii. an operational building designated by the Dominant Provider for use as an ODF Site in future; or**
 - iv. an operational building of the Dominant Provider or Third Party which is reasonably equivalent to one of the above;**
- n) **“Metallic Path Facilities”** or **“MPF”** means a circuit comprising a pair of twisted metal wires employing electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical energy to convey signals when connected to an electronic communications network;
- o) **“MPF Cancellation”** shall be construed as having the same meaning as the service described in row 3 of the table in Part 4 of the Annex to condition 7A;

- p) **“MPF Co-Location”** means the provision of space permitting a Third Party to occupy part of an MDF Site reasonably sufficient to permit the use of Metallic Path Facilities, and in particular to permit the connection of the Dominant Provider’s electronic communications network with the electronic communications network of a Third Party at that location;
- q) **“MPF Connection Charge”** shall be construed as having the same meaning as ‘MPF Connection Charge – New Provide Standard’, as provided by the Dominant Provider on its website for definitions and explanations of its products;
- r) **“MDF Site”** means the site of an operational building of the Dominant Provider that houses a main distribution frame;
- s) **“MPF Site Access”** means access (including the right of entry) to the Dominant Provider’s MDF Sites in order to install and operate an electronic communications network to provide electronic communications services via Metallic Path Facilities;
- t) **“MPF SML1 Rental”** shall be construed as having the same meaning as “MPF Discounted Rental (SML1 in tariff)” as provided by the Dominant Provider on its website for definitions and explanations of its products;
- u) **“MPF Service Maintenance Level 1”** shall be construed as having the same meaning as ‘Service Maintenance Level 1 (Annual Rental)’ in respect of the feature ‘LLU MPF’, as provided by the Dominant Provider on its website for definitions and explanations of its products;
- v) **“MPF Service Maintenance Level 2”** shall be construed as having the same meaning as ‘Service Maintenance Level 2 (Annual Rental)’ in respect of the feature ‘LLU MPF’, as provided by the Dominant Provider on its website for definitions and explanations of its products;

- w) **“MPF Service Maintenance Level 3”** shall be construed as having the same meaning as ‘Service Maintenance Level 3 (Annual Rental)’ in respect of the feature ‘LLU MPF’, as provided by the Dominant Provider on its website for definitions and explanations of its products;
- x) **“MPF Service Maintenance Level 4”** shall be construed as having the same meaning as ‘Service Maintenance Level 4 (Annual Rental)’ in respect of the feature ‘LLU MPF’, as provided by the Dominant Provider on its website for definitions and explanations of its products;
- y) **“Network Termination Point”** means the physical point at which a Relevant Subscriber is provided with access to a public electronic communications network;
- z) **“ODF Site” means the site of an operational building of the Dominant Provider housing an optical distribution frame for optical fibre access networks;**
- aa) **“Physical Infrastructure” includes any conduit, tunnel, subway, pipe, structure, pole or other thing in, on, by or from which an electronic communications network is or may be installed, supported, carried or suspended over Physical Infrastructure Access;**
- bb) **“Physical Infrastructure Access” means network access comprising predominantly of the provision of space, anchorage, attachment facilities and/or such other facilities as may be reasonably necessary to permit a Third Party to occupy parts of the Dominant Provider’s Physical Infrastructure located between Network Termination Points and Local Access Nodes serving those Network Termination Points, sufficient to facilitate the establishment, installation, operation and maintenance of**

the electronic communications network of a Third Party at that location;

- cc) **“Reference Offer”** means the terms and conditions on which the Dominant Provider is willing to enter into an Access Agreement;
- dd) **“Relevant Excess Revenue”** means the Excess Revenue earned from charging the Affected Communications Provider;
- ee) **“Relevant Subscriber”** means any person who is party to a contract with a provider of public electronic communications services for the supply of such services;
- ff) **“Relevant Year”** means each of the following three periods:
 - (1) the First Relevant Year;
 - (2) the Second Relevant Year; and
 - (3) the Third Relevant Year;
- gg) **“Second Relevant Year”** means the period of 12 months beginning on 1 April 2019 and ending on 31 March 2020;
- hh) **“Service Level Commitment”** means the quality standards that the Dominant Provider must meet when performing its obligations;
- ii) **“Service Level Guarantees”** means a commitment specifying the amount payable proactively by the Dominant Provider to a Third Party for a failure to adhere to a Service Level Commitment;
- jj) **“Shared Access”** means the non-voice band frequency of Metallic Path Facilities;
- kk) **“Sub-Loop Unbundling Service”** means access to Metallic Path Facilities or Shared Access at an intermediate point to the main distribution frame;

- ll) **“Third Party”** means a person providing a public electronic communications service or a person providing a public electronic communications network;
- mm) **“Third Relevant Year”** means the period of 12 months beginning on 1 April 2020 and ending on 31 March 2021;
- nn) **“Virtual Unbundled Local Access”** or **“VULA”** means network access comprising of a virtual circuit between a Point of Connection at the Local Serving Exchange and a Network Termination Point, which circuit provides such specified capacity as is agreed between the Dominant Provider and the Third Party for the Third Party’s exclusive use;
- oo) **“Working Day”** means any day other than Saturdays, Sundays, public holidays or bank holidays in England and Wales, Scotland or Northern Ireland (as applicable); and
- pp) references to the expression electronic communications network for the purposes of the expressions MPF Co-Location, MPF Co-Mingling, MPF Site Access, SLU MPF Ancillary Services, **PIA Co-Location, PIA Co-Mingling, PIA Site Access**, VULA Co-Location, VULA Co-Mingling and VULA Site Access, as they apply in condition 2 of Part 3 shall be limited to those matters set out at section 32(1)(b)(i)-(iii) of the Act.
2. For the purpose of interpreting this Schedule, except in so far as the context otherwise requires, the terms or descriptions of products and/or services used in this Schedule shall be construed as having the same meaning as those provided by the Dominant Provider on its website for definitions and explanations of its products in addition to future product updates. These are as at 31 March 2017 found as follows:
- For MPF and SMPF product information, please refer to: <http://www.openreach.co.uk/orpg/home/products/llu/llu.do>
 - For VULA (GEA – FTTC) product information please refer to: <https://www.openreach.co.uk/orpg/home/products/super-fastfibreaccess/fibretothecabinet/fttc.do>
 - For VULA (GEA – FTTP) product information please refer to: <https://www.openreach.co.uk/orpg/home/products/ultrafastfibreaccess/geafttp/ftp.do>

Wholesale Local Access Market Review:
Consultation on Duct and Pole Access remedies

- For assurance information including care levels, please refer to the Service Products section of the Openreach website:
http://www.openreach.co.uk/orpg/home/products/serviceproducts/service_products.do
- For information held in the price list, please refer to the Plan and Build area within the “Local Loop Unbundling Pricing” section of the price list available at:
<http://www.openreach.co.uk/orpg/home/products/pricing/loadPricing.do>

Part 3: SMP conditions

Condition 1 – Network access on reasonable request

- 1.1 The Dominant Provider must provide network access to a Third Party where that Third Party, in writing, reasonably requests it.
- 1.2 Except where condition 1.3 applies, the provision of network access by the Dominant Provider in accordance with this condition must:
- (a) take place as soon as reasonably practicable after receiving the request from a Third Party (and, in any event, in accordance with condition 11); and
 - (b) be on:
 - (i) fair and reasonable terms, conditions and charges; and
 - (ii) such terms, conditions and charges as OFCOM may from time to time direct.
- 1.3 Where any of conditions 6 or 7 apply the provision of network access by the Dominant Provider in accordance with this condition must:
- (a) take place as soon as reasonably practicable after receiving the request from a Third Party (and, in any event, in accordance with condition 11); and
 - (b) be on:
 - (i) fair and reasonable terms and conditions (excluding charges); and
 - (ii) such terms and conditions (excluding charges) as OFCOM may from time to time direct.

For the avoidance of doubt, condition 1.2 above shall apply to the provision of network access by the Dominant Provider in the specific form of MPF Service Maintenance Level 2, MPF Service Maintenance Level 3 and MPF Service Maintenance Level 4.

- 1.4** The provision of network access by the Dominant Provider in accordance with this condition must also include such associated facilities as are reasonably necessary for the provision of network access and such other entitlements as OFCOM may from time to time direct.
- 1.5** The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition.

Condition 2 – Specific forms of network access

2.1 Without prejudice to the generality of condition 1, the provision of network access under that condition must include, where the Third Party, in writing, reasonably requests, the following specific forms of network access–

(a) except insofar as OFCOM may from time to time otherwise consent in writing, Metallic Path Facilities including such MPF Ancillary Services as may be reasonably necessary for the use of Metallic Path Facilities;

(b) Virtual Unbundled Local Access including such VULA Ancillary Services as may be reasonably necessary for the use of Virtual Unbundled Local Access;

(c) Sub-Loop Unbundling Services including such SLU Ancillary Services as may be reasonably necessary for the use of Sub-Loop Unbundling Services; and

(d) Physical Infrastructure Access, including such PIA Ancillary Services as may be reasonably necessary for such use of Physical Infrastructure Access, for use by the requesting Third Party for the purposes of the deployment of broadband access networks serving multiple premises primarily for the provision of broadband access services to end users, provided that the provision of non broadband access services on any such broadband access network facilitate that overall broadband access network deployment.

2.2 In this condition 2:

(a) “**MPF Ancillary Services**” mean an associated facility or services associated with an electronic communications network and/or an electronic communications service which enable and/or support the provision of Metallic Path Facilities via that network and/or service or have the potential to do so, which include at a minimum (but without limitation) the following:

- (i) power;
- (ii) MPF Co-Location;
- (iii) MPF Co-Mingling;
- (iv) MPF Site Access;
- (v) MPF Internal Tie Circuits; and
- (vi) MPF External Tie Circuits;

(b) “**MPF Co-Mingling**” means the provision of MPF Co-Location having the following characteristics:

- (i) the Third Party’s electronic communications network is situated in an area of the MDF Site which:
 - A. is a single undivided space;
 - B. after proper performance by the Dominant Provider of its obligation to provide Metallic Path Facilities pursuant to conditions 1 and 2, would permit the normal operation of the Third Party’s electronic communications network (or would permit if the Dominant Provider removed any object or substance whether toxic or not, which might reasonably prevent or hinder the occupation of the MDF Site for such use); and
 - C. if so requested by the Third Party, is not unreasonably distant from the Dominant Provider’s electronic communications network within the MDF Site;
- (ii) no permanent physical partition is erected in the space between the Third Party’s electronic communications

network and the Dominant Provider's electronic communications network; and

- (iii) the Third Party's electronic communications network is neither owned nor run by the Dominant Provider or by any person acting on the Dominant Provider's behalf;
- (c) **"MPF Internal Tie Circuit"** means a link, the whole of which is contained within an MDF Site, that connects Metallic Path Facilities to the electronic communications network of a Third Party;
- (d) **"MPF External Tie Circuit"** means a link that connects Metallic Path Facilities to the electronic communications network of a Third Party at a location outside the MDF Site;
- (e) **"PIA Ancillary Services" mean an associated facility or services associated with an electronic communications network and/or an electronic communications service which enable and/or support the provision of Physical Infrastructure Access services via that network and/or service or have the potential to do so, which include at a minimum (but without limitation) the following:**
- i. **power;**
 - ii. **PIA Co-Location;**
 - iii. **PIA Co-Mingling;**
 - iv. **PIA Site Access; and**
 - v. **PIA Database Access**
- (f) **"PIA Co-Location" means the provision of space permitting a Third Party to occupy part of an MDF Site reasonably sufficient to permit the use of Physical Infrastructure Access;**

- (g) **“PIA Co-Mingling” means the provision of PIA Co-Location having the following characteristics:**
- i. the Third Party’s electronic communications network is situated in an area of the MDF Site which:**
 - A. is a single undivided space;**
 - B. after proper performance by the Dominant Provider of its obligation to provide Physical Infrastructure Access pursuant to conditions 1 and 2, would permit the normal operation of the Third Party’s electronic communications network (or would permit if the Dominant Provider removed any object or substance whether toxic or not, which might reasonably prevent or hinder the occupation of the MDF Site for such use); and**
 - C. if so requested by the Third Party, is not unreasonably distant from the Dominant Provider’s electronic communications network within the MDF site;**
 - ii. no permanent physical partition is erected in the space between the Third Party’s electronic communications network and the Dominant Provider’s electronic communications network; and**
 - iii. the Third Party’s electronic communications network is neither owned nor run by the**

**Dominant Provider or by any person acting on
the Dominant Provider's behalf;**

- (h) **“PIA Site Access” means access (including the right of entry) to the Dominant Provider's MDF Sites in order for a Third Party to install and operate an electronic communications network to provide electronic communications services over Physical Infrastructure Access;**

- (i) **“PIA Database Access” means access to an electronic database of the most up-to-date information held by the Dominant Provider in relation to the Dominant Provider's Physical Infrastructure, including location and capacity, for the purpose of a Third Party planning the deployment of an electronic communications network to provide electronic communications services over Physical Infrastructure Access. This database shall include any technical specifications or information related to the Dominant Provider's Physical Infrastructure as OFCOM may from time to time direct;**

- (j) **“SLU Ancillary Services”** mean an associated facility or services associated with an electronic communications network and/or an electronic communications service which enable and/or support the provision of Sub-Loop Unbundling Services via that network and/or service or have the potential to do so, which include at a minimum (but without limitation) SLU Tie Circuit;

- (k) **“SLU Tie Circuit”** means a link that connects Sub-Loop Unbundling Services to the electronic communications network of a Third Party;

- (l) **“VULA Ancillary Services”** mean an associated facility or services associated with an electronic communications network and/or an electronic communications service which enable and/or support the provision of Virtual Unbundled Local Access via that network and/or service or have the potential to do so, which include at a minimum (but without limitation) the following:

- i. power;
 - ii. VULA Co-Location;
 - iii. VULA Co-Mingling; and
 - iv. VULA Site Access;
- (m) “**VULA Co-Location**” means the provision of space permitting a Third Party to occupy part of a Local Serving Exchange reasonably sufficient to permit the use of Virtual Unbundled Local Access, and in particular to permit the connection of the Dominant Provider’s electronic communications network with the electronic communications network of a Third Party at that location;
- (n) “**VULA Co-Mingling**” means the provision of VULA Co-Location having the following characteristics:
- i. the Third Party’s electronic communications network is situated in an area of the Local Serving Exchange which:
 - A. is a single undivided space;
 - B. after proper performance by the Dominant Provider of its obligation to provide Virtual Unbundled Local Access pursuant to conditions 1 and 2, would permit the normal operation of the Third Party’s electronic communications network (or would permit if the Dominant Provider removed any object or substance whether toxic or not, which might reasonably prevent or hinder the occupation of the Local Serving Exchange for such use); and
 - C. if so requested by the Third Party, is not unreasonably distant from the Dominant Provider’s electronic communications network within the Local Serving Exchange;

- ii. no permanent physical partition is erected in the space between the Third Party's electronic communications network and the Dominant Provider's electronic communications network; and
 - iii. the Third Party's electronic communications network is neither owned nor run by the Dominant Provider or by any person acting on the Dominant Provider's behalf; and
- (o) "**VULA Site Access**" means access (including the right of entry) to the Dominant Provider's Local Serving Exchange in order to install and operate an electronic communications network to provide electronic communications services over Virtual Unbundled Local Access.

Condition 3 – Requests for new forms of network access

- 3.1** The Dominant Provider shall, for the purposes of transparency, publish guidelines in relation to requests for new forms of network access made to it. Such guidelines shall detail:
- (a) the form in which such a request should be made;
 - (b) the information that the Dominant Provider requires in order to consider a request for a new form of network access;
 - (c) the criteria by which requests will be assessed; and
 - (d) the timescales in which such requests will be handled by the Dominant Provider in accordance with this Condition.
- 3.2** Such guidelines shall be published within two months of the date that this Condition enters into force following a consultation with OFCOM and Third Parties. The Dominant Provider shall keep the guidelines under review and consult with relevant Third Parties and OFCOM before making any amendments to the guidelines. The Dominant Provider shall make such amendments to the guidelines as OFCOM may direct from time to time.
- 3.3** The Dominant Provider shall, upon a reasonable request from a Third Party considering making a request for a new form of network access, provide that Third Party with information so as to enable that Third Party to make a request for a new form of network access. Such information shall be provided within a reasonable period.
- 3.4** On receipt of a written request for a new form of network access, the Dominant Provider shall ensure that the requirements of this Condition are met. A modification of a request for a new form of network access which has previously been submitted to the Dominant Provider, and rejected by the Dominant Provider, shall be considered as a new request.
- 3.5** Within five Working Days of receipt of a request under Condition 3.3 the Dominant Provider shall acknowledge that request in writing.

- 3.6** Within fifteen Working Days of receipt of a request under Condition 3.3 the Dominant Provider shall respond in writing to the requesting Third Party in one of the following ways:
- (a) the Dominant Provider shall confirm that the request will be met and shall confirm that the following will be prepared—
 - (i) the timetable for the provision of network access;
 - (ii) an initial offer of terms and conditions for the provision of network access; and
 - (iii) the timetable for the agreement of technical issues;
 - (b) the Dominant Provider shall confirm that a feasibility study is reasonably required in order to determine whether the request made is reasonable and the Dominant Provider shall set out its objective reasons for the need for such a study;
 - (c) the Dominant Provider shall confirm that the request is not sufficiently well formulated and, where it does so, the Dominant Provider shall detail all of the defects in the request which has been made; or
 - (d) the Dominant Provider shall confirm that the request is refused on the basis that it is not reasonable and, where it does so, the Dominant Provider shall detail its reasons for refusal.

- 3.7** Where the Dominant Provider responds to a request under Condition 3.3 in accordance with Condition 3.6(a) it shall, within thirty five Working Days of receipt of a request under Condition 3.3, respond further to the requesting Third Party in writing and:
- (a) confirm the timetable for the provision of network access;
 - (b) provide an initial offer of terms and conditions for the provision of network access; and
 - (c) confirm the timetable for the agreement of technical issues.

- 3.8** Where the Dominant Provider responds to a request under Condition 3.3 in accordance with Condition 3.6(a) and determines, due to a genuine error of fact, that it reasonably needs to complete a feasibility study, it may, as soon as practicable and in any event, within thirty five Working Days of receipt of a request under Condition 3.3, inform the requesting Third Party that a feasibility study is reasonably required and set out its objective reasons for such a study.
- 3.9** Where Condition 3.8 applies the Dominant Provider shall, within forty five Working Days from the date that the Dominant Provider informs the requesting Third Party that a feasibility study is reasonably required, respond further to the requesting Third Party, in writing, in one of the following ways:
- (a) the Dominant Provider shall confirm that the request will be met and shall:
 - (i) confirm the timetable for the provision of network access;
 - (ii) provide an initial offer of terms and conditions for the provision of network access; and
 - (iii) confirm the timetable for the agreement of technical issues.
 - (b) the Dominant Provider shall confirm that the request is refused on the basis that it is not reasonable and, where it does so, the Dominant Provider shall detail its reasons for refusal. The Dominant Provider shall provide to OFCOM a copy of the feasibility study and shall provide to the requesting Third Party a non-confidential copy of the feasibility study.
- 3.10** The time limit set out in Condition 3.9 shall be extended up to seventy Working Days from the date that the Dominant Provider informs the requesting Third Party that a feasibility study is reasonably required pursuant to Condition 3.8, if—
- (a) circumstances have arisen which, despite the Dominant Provider using its best endeavours, prevent it from completing the feasibility study within forty five Working Days of the date that the requesting

Third Party was informed of the need for a feasibility study pursuant to Condition 3.8; or

- (b) the Third Party and the Dominant Provider agree to extend the time limit up to seventy Working Days.

3.11 The time limit set out in Condition 3.9 shall be extended beyond seventy Working Days from the date that the Dominant Provider informs the requesting Third Party that a feasibility study is reasonably required pursuant to Condition 3.8, if:

- (a) OFCOM agrees; or
- (b) the Third Party and the Dominant Provider agree to extend the time limit beyond seventy Working Days.

3.12 Where the Dominant Provider responds to a request under Condition 3.4 in accordance with Condition 3.6(b), the Dominant Provider shall, within sixty Working Days of receipt of a request under Condition 3.3, respond further to the requesting Third Party, in writing, in one of the following ways:

- (a) the Dominant Provider shall confirm that the request will be met and shall:
 - (i) confirm the timetable for the provision of network access;
 - (ii) provide an initial offer of terms and conditions for the provision of network access; and
 - (iii) confirm the timetable for the agreement of technical issues;
- (b) the Dominant Provider shall confirm that the request is refused on the basis that it is not reasonable and, where it does so, the Dominant Provider shall detail its reasons for refusal. The Dominant Provider shall provide to OFCOM a copy of the feasibility study and shall provide to the requesting Third Party a non-confidential copy of the feasibility study.

- 3.13** The time limit set out in Condition 3.12 shall be extended up to eighty five Working Days of receipt of a request under Condition 3.3, if:
- (a) circumstances have arisen which, despite the Dominant Provider using its best endeavours, prevent it from completing the feasibility study within sixty Working Days of receipt of a request under Condition 3.3; or
 - (b) the Third Party and the Dominant Provider agree to extend the time limit up to eighty five Working Days.
- 3.14** The time limit set out in Condition 3.12 shall be extended beyond eighty five Working Days of receipt of a request under Condition 3.3, if—
- (a) OFCOM agrees; or
 - (b) the Third Party and the Dominant Provider agree to extend the time limit beyond eighty five Working Days.
- 3.15** The Dominant Provider shall keep the processes it has put in place to ensure compliance with this Condition under review to ensure that they remain adequate for that purpose.
- 3.16** The Dominant Provider shall comply with any direction OFCOM may make from time to time under this Condition.

Condition 4 – No undue discrimination

- 4.1** Except insofar as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must not unduly discriminate against particular persons or against a particular description of persons, in relation to the provision of network access in accordance with conditions 1 and 2, as applicable.
- 4.2** In this condition, the Dominant Provider may be deemed to have shown undue discrimination if it unfairly favours to a material extent an activity carried on by it so as to place one or more Third Parties at a competitive disadvantage in relation to activities carried on by the Dominant Provider.
- 4.3** The Dominant Provider must publish all such information in relation to the provision of network access provided by the Dominant Provider pursuant to Condition 2.1(d) in such manner and form, and including such content, as OFCOM may from time to time direct for the purposes of providing transparency on the Dominant Provider's compliance with its obligations under this Condition 4.

Condition 5 – Equivalence of Inputs basis

- 5.1** Subject to condition 5.2, the Dominant Provider must provide network access in accordance with conditions 1 and 2 (as applicable) on an Equivalence of Inputs basis.
- 5.2** The obligation in condition 5.1 to provide network access on an Equivalence of Inputs basis shall not apply to—
- (a) the provision of Sub-Loop Unbundling Services in accordance with conditions 1 and 2;
 - (b) the provision of Physical Infrastructure Access in accordance with conditions 1 and 2;**
 - (b)(c)** existing network access which the Dominant Provider was not providing on an Equivalence of Inputs basis as at the date that this condition enters into force; and
 - (c)(d)** such provision of network access as OFCOM may from time to time otherwise consent in writing.
- 5.3** Without prejudice to the generality of condition 5.1, the Dominant Provider must not provide (or seek to provide) network access for its own services (including for those of its retail divisions, subsidiaries or partners), unless at the same time the Dominant Provider provides and/or offers to provide such network access to Third Parties (other than its retail divisions, subsidiaries or partners) on an Equivalence of Inputs basis.
- 5.4** For the avoidance of doubt, the obligations set out in this condition 5 apply in addition to the obligations set out in condition 4.
- 5.5** In this condition 5:
- (a) **“Equivalence of Inputs basis”** means that the Dominant Provider must provide, in respect of a particular product or

service, the same product or service to all Third Parties and itself on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes, and includes the provision to all Third Parties and itself of the same Relevant Commercial Information about such products, services, systems and processes as the Dominant Provider provides to its own divisions, subsidiaries or partners. In particular, it includes the use by the Dominant Provider of such systems and processes in the same way as Third Parties and with the same degree of reliability and performance as experienced by Third Parties.

In this definition “the same” means exactly the same subject only to:

- (A) trivial differences;
- (B) differences relating to:
 - (i) credit vetting procedures,
 - (ii) payment procedures,
 - (iii) matters of national and crime-related security (which for the avoidance of doubt includes for purposes related to the Regulation of Investigatory Powers Act 2000), physical security, security required to protect the operational integrity of the network,
 - (iv) provisions relating to the termination of a contract, or
 - (v) contractual provisions relating to requirements for a safe working environment;
- (C) differences relating to the provision of Relevant Commercial Information by the Dominant Provider to its own divisions, subsidiaries or partners where this is necessary for purposes other than relating to the provision of network access to those own divisions, subsidiaries or partners; and

(D) such other differences as OFCOM may from time to time consent to in writing.

For the avoidance of any doubt, unless seeking OFCOM's consent, the Dominant Provider may not rely on any other reasons in seeking to objectively justify the provision in a different manner.

(b) “**Relevant Commercial Information**” means information of a commercially confidential nature relating to products and/or services to which this condition 5 applies, and which relates to any or all of the following in relation thereto—

- i. product development;
- ii. pricing;
- iii. marketing strategy and intelligence;
- iv. product launch dates;
- v. cost;
- vi. projected sales volumes; or
- vii. network coverage and capabilities;

save for any such information in relation to which OFCOM consents in writing is to be treated as falling outside this definition.

Condition 6 – Basis of charges

- 6.1** Except insofar as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must secure, and must be able to demonstrate to the satisfaction of OFCOM, that the Electricity Charge when averaged over each Relevant Year is reasonably derived from the costs of provision based on the wholesale electricity charges paid by the Dominant Provider plus an appropriate mark-up to reflect the Dominant Provider's costs related to its wholesale purchase of electricity and the setting of the Electricity Charge.
- 6.2** Except where condition 6.3 applies, the Dominant Provider must secure, and must be able to demonstrate to the satisfaction of OFCOM, that each and every charge offered or payable when averaged over each Relevant Year for Sub-Loop Unbundling Services provided under conditions 1 and 2 is reasonably derived from the costs of provision calculated on a reasonable forward looking fully allocated cost basis, including an appropriate return on capital employed.
- 6.3** The Dominant Provider must secure, and must be able to demonstrate to the satisfaction of OFCOM, that each and every charge offered or payable when averaged over each Relevant Year:
- (a) for SLU MPF Rental provided under conditions 1 and 2 is reasonably derived from the costs of provision calculated by reference to the charge for MPF Rental (determined in accordance with condition [●]) for the corresponding Relevant Year adjusted to reflect the difference in the forward looking long run incremental costs of SLU MPF Rental;
 - (b) for SLU MPF Connection provided under conditions 1 and 2 is reasonably derived from the costs of provision calculated by reference to the charge for MPF Connection Charge (determined in accordance with condition [●]) for the corresponding Relevant Year adjusted to reflect the difference in the forward looking long run incremental costs of SLU MPF Connection; and
 - (c) for SLU SMPF Connection provided under conditions 1 and 2 is reasonably derived from the costs of provision calculated by reference to the charge for SMPF New Provide (determined in accordance with condition [LLU charge control] for

the corresponding Relevant Year adjusted to reflect the difference in the forward looking long run incremental costs of SLU SMPF Connection

6.4 [OFCOM's proposals in relation to physical infrastructure access pricing will (WLA – be contained in a separate notification under sections 48A of the Act) PIA)

6.5 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition.

6.6 In this condition 6:

- (a) **“Electricity Charge”** means the charge from time to time on a usage per kWh basis for electricity purchased by Third Parties to provide power for equipment used in connection with network access provided under conditions 1 and 2;
- (b) **“SLU MPF Connection”** shall be construed as having the same meaning as “Sub Loop MPF Connection charge - New Provide – Standard” as provided by the Dominant Provider on its website for definitions and explanations of its products;
- (c) **“SLU SMPF Connection”** shall be construed as having the same meaning as “Sub Loop – Shared MPF Connection (including SMPF Transfer)” as provided by the Dominant Provider on its website for definitions and explanations of its products;
- (d) **“SLU MPF Rental”** shall be construed as having the same meaning as “Sub Loop MPF Rental per annum” as provided by the Dominant Provider on its website for definitions and explanations of its products.

Condition 7 – Charge controls

[OFCOM's proposals in relation to physical infrastructure access pricing will be contained in a separate notification under sections 48A of the Act]

Condition 8 – Publication of a Reference Offer

- 8.1** Except in so far as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must publish a Reference Offer in relation to the provision of network access pursuant to condition 1 and act in the manner set out below.
- 8.2** Subject to condition 8.11, the Dominant Provider must ensure that a Reference Offer in relation to the provision of network access pursuant to condition 1 includes, where applicable, at least the following—
- (a) a description of the network access to be provided, including technical characteristics (which shall include information on network configuration where necessary to make effective use of network access);
 - (b) the locations at which network access will be provided;
 - (c) any relevant technical standards for network access (including any usage restrictions and other security issues);
 - (d) the conditions for access to ancillary, supplementary and advanced services (including operational support systems, information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing);
 - (e) any ordering and provisioning procedures;
 - (f) relevant charges, terms of payment and billing procedures;
 - (g) details of interoperability tests;
 - (h) details of traffic and network management;
 - (i) details of maintenance and quality as follows—
 - (i) specific time scales for the acceptance or refusal of a request for supply and for completion, testing and hand-over or delivery of services and facilities, and for provision of support services (such as fault handling and repair);

- (ii) service level commitments, namely the quality standards that each party must meet when performing its contractual obligations;
- (iii) the amount of compensation payable by one party to another for failure to perform contractual commitments;
- (iv) a definition and limitation of liability and indemnity; and
- (v) procedures in the event of alterations being proposed to the service offerings, for example, launch of new services, changes to existing services or change to prices;
- (j) details of measures to ensure compliance with requirements for network integrity;
- (k) details of any relevant intellectual property rights;
- (l) a dispute resolution procedure to be used between the parties;
- (m) details of duration and renegotiation of agreements;
- (n) provisions regarding confidentiality of the agreements;
- (o) rules of allocation between the parties when supply is limited (for example, for the purpose of co-location or location of masts); and
- (p) the standard terms and conditions for the provision of network access.

8.3 Subject to condition 8.11, the Dominant Provider must ensure that a Reference Offer in relation to the provision of Metallic Path Facilities pursuant to conditions 1 and 2 also includes at least the following:

- (a) the location of MDF Sites;
- (b) the area within which network access to Metallic Path Facilities could be made available from each of the MDF Sites listed under (a) above;
- (c) the availability of MPF Co-Location (including the options for such co-location) at each of the MDF Sites listed under (a) above;

- (d) equipment characteristics, including any restrictions on equipment for the purposes of MPF Co-Location at each of the MDF Sites listed under (a) above;
- (e) conditions for MPF Site Access at each of the MDF Sites listed under (a) above, including conditions for access for staff of those Third Parties to whom the Dominant Provider provides Local Loop Unbundling Services;
- (f) conditions for the inspection of MDF Sites at which MPF Co-Location is available or at which MPF Co-Location has been refused on grounds of lack of capacity;
- (g) safety standards;
- (h) the relevant charges (or charging formulae) for each feature, function and facility involved in the provision of Metallic Path Facilities; and
- (i) anything which may reasonably be regarded as being likely to materially affect the availability of the relevant Metallic Path Facilities.

8.3B (WLA - PIA) Conditions 8.3(b)(iii) and 8.3(l) to (p) shall enter in force from [date one year from date of publication of notification under sections 48(1) and 79(4) of the Act]:

Subject to condition 8.11, the Dominant Provider must ensure that a Reference Offer in relation to the provision of Physical Infrastructure Access pursuant to conditions 1 and 2 also includes at least the following:

(a) the location of Physical Infrastructure or the method by which Third Parties may obtain information about the location of Physical Infrastructure;

(b) technical specifications for Physical Infrastructure Access including:

(i) technical specifications for permitted cables and associated equipment;

(ii) cable installation, attachment and recovery methods; and

(iii) technical specifications relevant to the repair of existing faulty Physical Infrastructure.

- (c) the methodology for calculating availability of spare capacity in Physical Infrastructure;**
- (d) procedures for the provision of information to Third Parties about spare capacity, including arrangements for visual surveys of Physical Infrastructure to determine spare capacity;**
- (e) conditions for reserving capacity that shall apply equally to the Dominant Provider and Third Parties;**
- (f) conditions for the installation and recovery of cables and associated equipment;**
- (g) arrangements for relieving congested Physical Infrastructure, including the repair of existing faulty infrastructure and the construction of new Physical Infrastructure**
- (h) a procedure for the Dominant Provider to announce plans reasonably in advance for new construction of Physical Infrastructure such that Third Parties may request the Dominant Provider to install additional capacity for those Third Parties;**
- (i) conditions for Third Parties to gain access to the Physical Infrastructure including if appropriate training, certification and authorisation requirements for personnel permitted to access and work in/on Physical Infrastructure;**
- (j) the arrangements for maintenance of cables and associated equipment installed by Third Parties and of the Physical Infrastructure, including provision for the temporary occupation of additional infrastructure capacity for the installation of replacement cables;**
- (k) conditions for the inspection of the Physical Infrastructure at which access is available or at which access has been refused on grounds of lack of capacity;**
- (l) the information that a Third Party is required to provide to the Dominant Provider where that Third Party is requesting the repair of existing faulty infrastructure and/or the construction of new Physical Infrastructure;**

(m) Service Level Commitments in respect of at least the following:

(i) the provision by the Dominant Provider to a Third Party of an Acceptance Notice;

(ii) the completion by the Dominant Provider of any works necessary to relieve congested Physical Infrastructure other than a congested Pole;

(iii) the provision by the Dominant Provider of a response to a request by a Third Party to undertake works itself to relieve congested Physical Infrastructure;

(iv) the provision by the Dominant Provider to a Third Party of a Pole Acceptance Notice;

(v) the completion by the Dominant Provider of any works necessary to relieve a congested Pole; and

(vi) the completion by the Dominant provider of any works necessary to relieve congested Physical Infrastructure where this comprises the installation of a Footway Box;

(n) Service Level Guarantees in respect of the Service Level Commitments specified in condition (m)(i) to (m)(vi) above;

(o) conditions for the provision of forecasts by a Third Parties in respect of their future requirements for Physical Infrastructure Access; and

(p) conditions on which Third Parties may elect to undertake build works on behalf of the Dominant Provider.

8.4 Subject to condition 8.11, the Dominant Provider must ensure that a Reference Offer made in relation to the provision of network access to Metallic Path Facilities pursuant to conditions 1 and 2 includes–

(a) Service Level Commitments in respect of at least the following aspects of that service:

(i) availability of an appointment for the provision of the service;

- (ii) attending appointments for the provision of the service;
- (iii) completion of the provision of the service;
- (iv) completion of the transfer of the service;
- (v) line working at completion of provisioning process;
- (vi) disconnections made in error;
- (vii) fault repair times;
- (viii) attending fault repair appointments; and
- (ix) availability of the relevant operational support systems by which requests for service provision, transfers and fault repair are made as applicable;

(b) Service Level Guarantees in respect of the Service Level Commitments specified in condition 8.4(a)(i) to (a)(viii) above.

8.5

Subject to condition 8.11, the Dominant Provider must ensure that a Reference Offer made in relation to the provision of Virtual Unbundled Local Access pursuant to conditions 1 and 2 includes—

(a) Service Level Commitments in respect of at least the following aspects of that service:

- (i) availability of an appointment for the provision of the service;
- (ii) attending appointments for the provision of the service;
- (iii) completion of the provision of the service;
- (iv) completion of the transfer of the service;
- (v) line working at completion of provisioning process;

- (vi) disconnections made in error;
- (vii) fault repair times;
- (viii) attending fault repair appointments; and
- (ix) availability of the relevant operational support systems by which requests for service provision, transfers and fault repair are made as applicable; and
- (x) Service Level Guarantees in respect of the Service Level Commitments specified in condition 8.5(a)(i) to (a)(vi) above.

8.6 To the extent that the Dominant Provider provides to itself network access that:

(a) is the same, similar or equivalent to that provided to any Third Party; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any Third Party;

in a manner that differs from that detailed in a Reference Offer in relation to network access provided to any Third Party, the Dominant Provider must ensure that it publishes a Reference Offer in relation to the network access that it provides to itself which includes, where relevant, at least those matters detailed in condition 8.2(a) to (p).

8.7 The Dominant Provider must, on the date that this condition enters into force, publish a Reference Offer in relation to any network access that it is providing as at the date that this condition enters into force.

8.8 The Dominant Provider must update and publish the Reference Offer in relation to any amendments or in relation to any further network access provided after the date that this condition enters into force.

8.9 **In relation to specific forms of network access to be provided under Condition 2.1(d), the Dominant Provider must:**

(a) publish a draft Reference Offer in relation to Physical Infrastructure Access updated to reflect the prospective entry into force of the obligations at Conditions 8.3(b)(iii) and 8.3(l) to (p) by no later than [date four months from date of publication of notification under sections 48(1) and 79(4) of the Act]; and

(b) publish a final Reference Offer in relation to Physical Infrastructure Access updated to reflect the entry into force of the obligations at Conditions 8.3(b)(iii) and 8.3(l) to (p) by no later than [date one year from date of publication of notification under sections 48(1) and 79(4) of the Act].

8.109 Publication referred to above shall be effected by the Dominant Provider placing a copy of the Reference Offer on any relevant publicly accessible website operated or controlled by the Dominant Provider.

8.110 The Dominant Provider must send a copy of the current version of the Reference Offer to any person at that person's written request (or such parts as have been requested).

8.124 The Dominant Provider must make such modifications to the Reference Offer as OFCOM may direct from time to time.

8.132 The Dominant Provider must provide network access at the charges, terms and conditions in the relevant Reference Offer and must not depart therefrom either directly or indirectly.

8.143 The Dominant Provider must comply with any direction OFCOM may make from time to time under this condition.

8.15 In this condition 8:

“Acceptance Notice” means a notice responding to a request by a Third Party to relieve congested Physical Infrastructure other than a congested Pole which confirms:

(i) that the request has been accepted by the Dominant Provider; and

(ii) how the Dominant Provider proposes to relieve that congestion;

“Footway Box” means an underground chamber in the footway used as a point for access to duct or cables to the premises and the Dominant Provider’s physical infrastructure.

“Pole Acceptance Notice” means a notice responding to a request by a Third Party to relieve a congested Pole which confirms:

(i) that the request has been accepted by the Dominant Provider; and

(ii) how the Dominant Provider proposes to relieve that congestion;

“Pole” means any pole forming part of Physical Infrastructure.

Condition 9 – Notification of charges and terms and conditions

- 9.1** Except in so far as OFCOM may from time to time otherwise consent in writing, the Dominant Provider must publish charges, terms and conditions and act in the manner set out in this condition.
- 9.2** Where it proposes a WLA Access Change, the Dominant Provider must send to every person with whom it has entered into an Access Agreement pursuant to condition 1 or conditions 1 and 2 (as the case may be), a WLA Access Change Notice.
- 9.3** The obligation in condition 9.2 shall not apply where the WLA Access Change is directed or determined by OFCOM or is a consequence of such direction or determination (including pursuant to the setting of an SMP services condition under the power in section 45 of the Act) or required by a notification or enforcement notification issued by OFCOM under sections 96A or 96C of the Act.
- 9.4** A WLA Access Change Notice must—
- (a) in the case of a WLA Access Change involving new network access, be sent not less than 28 days before any such amendment comes into effect;
 - (b) in the case of a WLA Access Change relating solely to a reduction in the price of existing network access (including, for the avoidance of doubt, a Special Offer), be sent not less than 28 days before any such amendment comes into effect;
 - (c) in the case of a WLA Access Change relating to the end of a temporary price reduction in accordance with the terms of a Special Offer, be sent not less than 28 days before any such amendment comes into effect; and

(d) in the case of any other WLA Access Change involving existing network access, be sent not less than 90 days before any such amendment comes into effect.

9.5 The Dominant Provider must ensure that a WLA Access Change Notice includes—

(a) a description of the network access in question;

(b) a reference to the location in the Dominant Provider's current Reference Offer of the terms and conditions associated with the provision of that network access;

(c) the current and proposed new charge and/or current and proposed new terms and conditions (as the case may be); and

(d) the date on which, or the period for which, the WLA Access Change will take effect (the "**effective date**").

9.6 The Dominant Provider must not apply any WLA Access Change identified in a WLA Access Change Notice before the effective date.

9.7 To the extent that the Dominant Provider provides to itself network access that—

(a) is the same, similar or equivalent to that provided to any Third Party; or

(b) may be used for a purpose that is the same, similar or equivalent to that provided to any Third Party,

in a manner that differs from that detailed in a WLA Access Change Notice in relation to network access provided to any Third Party, the Dominant Provider must ensure that it sends to OFCOM a notice in relation to the network access that it provides to itself which includes, where relevant, at least those matters detailed in conditions 9.5(a) to (d) and, where the Dominant Provider amends the charges, terms and conditions on which it provides itself with network access, it must

ensure it sends to OFCOM a notice equivalent to a WLA Access Change Notice.

9.8

In this condition 9:

- (a) “**Access Charge Change Notice**” means a notice given by the Dominant Provider of an Access Charge Change;
- (b) “**Access Charge Change**” means any amendment to the Dominant Provider’s charges for the provision of network access or for new network access;
- (c) “**Special Offer**” means a temporary price reduction for a particular product or service, applicable to all customers on a non-discriminatory basis, which is stated to apply for a limited and predefined period and where the price immediately on expiry of that period is no higher than the price immediately before the start of that period;
- (d) “**WLA Access Change**” means any amendment to the charges, terms and conditions on which the Dominant Provider provides network access or in relation to any charges for new network access; and
- (e) “**WLA Access Change Notice**” means a notice given by the Dominant Provider of a WLA Access Change.

Condition 10 – Notification of technical information

10.1 Except in so far as OFCOM may from time to time otherwise consent in writing, where the Dominant Provider provides network access pursuant to condition 1 or conditions 1 and 2 (as the case may be) and proposes new or amended terms and conditions relating to the following—

- (a) technical characteristics (including information on network configuration, where necessary, to make effective use of the network access provided);
- (b) the locations at which network access will be provided; or
- (c) technical standards (including any usage restrictions and other security issues),

the Dominant Provider must publish a written notice (the “**Notice**”) of the new or amended terms and conditions within a reasonable time period. Other than where the new or amended terms and conditions are a consequence of new or amended technical specifications determined by NICC Standards Limited (whose registered company number is 6613589), that reasonable notice must be not less than 90 days before either the Dominant Provider enters into an Access Agreement to provide the new network access or the amended terms and conditions of an existing Access Agreement come into effect.

10.2 The obligation in condition 10.1 shall not apply where the new or amended charges or terms and conditions are directed or determined by OFCOM or is a consequence of such direction or determination (including pursuant to the setting of an SMP services condition under the power in section 45 of the Act) or are required by a notification or enforcement notification issued by OFCOM under sections 96A or 96C of the Act;

10.3 The Dominant Provider must ensure that the Notice includes—

- (a) a description of the network access in question;
- (b) a reference to the location in the Dominant Provider’s Reference Offer of the relevant terms and conditions;

(c) the date on which or the period for which the Dominant Provider may enter into an Access Agreement to provide the new network access or any amendments to the relevant terms and conditions will take effect (the “**effective date**”).

10.4 The Dominant Provider must not enter into an Access Agreement containing the terms and conditions identified in the Notice or apply any new relevant terms and conditions identified in the Notice before the effective date.

10.5 Publication referred to in condition 10.1 must be effected by the Dominant Provider—

(a) placing a copy of the Notice on any relevant publicly accessible website operated or controlled by the Dominant Provider;

(b) sending a copy of the Notice to OFCOM; and

(c) sending a copy of the Notice to any person at that person’s written request, and where the Notice identifies a modification to existing relevant terms and conditions, to every person with which the Dominant Provider has entered into an Access Agreement pursuant to condition 1 or conditions 1 and 2 (as the case may be). The provision of such a copy of the Notice by the Dominant Provider may be subject to a reasonable charge.

Condition 11 – Quality of service

- 11.1** The Dominant Provider must comply with all such quality of service requirements as OFCOM may from time to time direct in relation to network access provided by the Dominant Provider pursuant to Conditions 1 and 2 (as applicable).
- 11.2** The Dominant Provider must publish all such information as to the quality of service in relation to network access provided by the Dominant Provider pursuant to Conditions 1 and 2 (as applicable), in such manner and form, and including such content, as OFCOM may from time to time direct.

Condition 12 – Regulatory Financial Reporting

General requirements

- 12.1** The Dominant Provider must maintain a separation for accounting purposes between such different matters relating to network access to the relevant network or the availability of the relevant facilities, as required by conditions 12.3 to 12.35 including as OFCOM may from time to time direct under those conditions 12.3 to 12.35.
- 12.2** The Dominant Provider must comply with such rules made by OFCOM about the use of cost accounting systems as required by conditions 12.3 to 12.35 and must comply with such requirements about the description to be made available to the public of the cost accounting system as required by conditions 12.3 to 12.35 in each case including as OFCOM may from time to time direct under conditions 12.3 to 12.35.
- 12.3** Except in so far as OFCOM may consent otherwise in writing, the Dominant Provider shall act in the manner set out in these conditions.
- 12.4** OFCOM may from time to time make such directions as they consider appropriate in relation to the Dominant Provider's obligations under these conditions.
- 12.5** The Dominant Provider shall comply with any direction OFCOM may make from time to time under these conditions.
- 12.6** Where the Dominant Provider is required to comply with:
- (i) these conditions; and
 - (ii) the Regulatory Accounting Principles,
- and it appears to the Dominant Provider that any of these requirements conflict with each other in a particular case, the Dominant Provider must resolve such conflict by giving priority to them in the order in which they are set out above.
- 12.7** For the purpose of these conditions, publication shall be effected by:

- (i) placing a copy of the relevant information on any relevant publicly available website operated or controlled by the Dominant Provider; and
- (ii) sending a copy of the relevant information to any person at that person's written request.

Requirements relating to the preparation, audit, delivery and publication of the Regulatory Financial Statements

12.8 The Dominant Provider shall in respect of the Market, Technical Areas, Products, Network Components and Network Services (as applicable), for each Financial Year:

- (i) prepare such Regulatory Financial Statements as directed by OFCOM from time to time in accordance with these conditions, the Regulatory Accounting Principles and the Accounting Methodology Documents (the relevant Accounting Methodology Documents to be identified in the Regulatory Financial Statements by reference to their date);
- (ii) prepare a reconciliation report as set out in condition 12.23;
- (iii) secure the expression of an audit opinion upon the Regulatory Financial Statements as notified by OFCOM from time to time and on the reconciliation report as set out in condition 12.24;
- (iv) secure the approval of the Regulatory Financial Statements by the board of directors of the Dominant Provider and secure the signature of the Regulatory Financial Statements by a director of the Dominant Provider for and on behalf of the board of directors;
- (v) deliver to OFCOM copies of the Regulatory Financial Statements, the reconciliation report and any corresponding audit opinion, each and all of which shall be in the form in which they are ultimately to be published, at least two weeks before they are required to be published;

- (vi) publish the Regulatory Financial Statements, the reconciliation report and any corresponding audit opinion, within four months after the end of the Financial Year to which they relate;
- (vii) ensure that any Regulatory Financial Statement and corresponding audit opinion that it delivers to OFCOM and/or publishes are fit for such purpose (or purposes), if any, as notified by OFCOM in writing; and
- (viii) publish with the Regulatory Financial Statements any written statement made by OFCOM and provided to the Dominant Provider commenting on the figures in, the notes to or the presentation of any or all of the Regulatory Financial Statements, the reconciliation report and/or the Accounting Methodology Documents.

12.9 The Dominant Provider shall make such amendments to the form and content of the Regulatory Financial Statements as are necessary to give effect fully to the requirements of these conditions. The Dominant Provider shall provide to OFCOM particulars of any such amendment, the reasons for it and its effect, when it delivers the Regulatory Financial Statements to OFCOM.

12.10 The Dominant Provider shall prepare all Regulatory Financial Statements, explanations or other information required by virtue of these conditions on a regulatory asset value adjusted current cost basis as directed by OFCOM from time to time and shall be capable of doing so in relation to any period. Such Regulatory Financial Statements, explanations or other information shall be, in the opinion of OFCOM, meaningfully reconcilable to the Statutory Financial Statements.

12.11 Each Regulatory Financial Statement shall include Prior Year Comparatives which shall be prepared on a basis consistent with Current Year Figures. The Dominant Provider may depart from this requirement in preparing the Regulatory Financial Statements for a Financial Year if there are reasons for doing so provided that the particulars of the departure, the reasons for it and its effect are stated in a note in the

Regulatory Financial Statements in accordance with the Statutory Accounting Standards.

Requirements relating to audit of the Regulatory Financial Statements

12.12 The Regulatory Auditor that the Dominant Provider from time to time appoints shall at all times be satisfactory to OFCOM having regard to such matters as OFCOM consider appropriate. The Dominant Provider shall notify OFCOM in writing of the Regulatory Auditor appointed to secure compliance with these conditions before the Regulatory Auditor carries out any work for that purpose. The Dominant Provider shall notify OFCOM of any proposed change of Regulatory Auditor 28 days before effect is given to that change.

12.13 In the event that the Regulatory Auditor is in the opinion of OFCOM unsatisfactory, the Dominant Provider shall appoint and instruct an Alternative Regulatory Auditor that is at all times satisfactory to OFCOM having regard to such matters as OFCOM consider appropriate. The Dominant Provider shall ensure that the Alternative Regulatory Auditor:

- (i) carries out such on-going duties as are required to secure compliance with these conditions;
- (ii) carries out work or further work, in addition to that performed by the Statutory Auditor and/or by the former Regulatory Auditor, in relation to such matters connected to compliance with these conditions as are of concern to OFCOM and notified to the Dominant Provider in writing; and/or
- (iii) re-performs work previously performed by the Statutory Auditor and/or by the former Regulatory Auditor in relation to such matters connected to compliance with this condition as are of concern to OFCOM and notified to the Dominant Provider in writing.

12.14 The Dominant Provider shall extend to the Alternative Regulatory Auditor such assistance and co-operation as would be extended to the Statutory Auditor and/or to the Regulatory Auditor and, to the extent similar assistance and co-operation may be required from the Statutory Auditor

and/or from the former Regulatory Auditor, the Dominant Provider shall use its best endeavours to secure such assistance and co-operation.

12.15 The Dominant Provider's letter of engagement appointing the Regulatory Auditor or Alternative Regulatory Auditor shall include such provisions acknowledging the acceptance by the Regulatory Auditor or Alternative Regulatory Auditor of duties and responsibilities to OFCOM in respect of its audit work, audit report and audit opinion as are consistent with the ICAEW Guidance.

12.16 The Dominant Provider shall use its best endeavours to obtain from the Regulatory Auditor or Alternative Regulatory Auditor any further explanation and clarification of any audit opinion required under these conditions and any other information in respect of the matters which are the subject of that audit opinion as OFCOM shall require.

12.17 The Dominant Provider shall obtain such assurance statement in the form of the Agreed Upon Procedures in relation to the Dominant Provider's obligations under these conditions as directed by OFCOM.

Requirements relating to the Accounting Methodology Documents

12.18 The Dominant Provider must prepare, maintain and keep up-to-date the Accounting Methodology Documents in accordance with these conditions, with the Regulatory Accounting Guidelines, and with the Regulatory Accounting Principles.

12.19 The Dominant Provider must include in the Accounting Methodology Documents documentation setting out a description of each of the Attribution Methods, the Transfer Charge System Methodology, the Accounting Policies and the Long Run Incremental Cost Methodology, to the extent not covered in the Regulatory Accounting Guidelines.

12.20 The Dominant Provider must deliver an up-to-date version of the Accounting Methodology Documents to OFCOM when it delivers the Regulatory Financial Statements to OFCOM in accordance with condition 12.8 and publish such up-to-date version on or before the day of publication of the Regulatory Financial Statements which have been prepared in accordance with such version.

Requirements relating to changes to the Regulatory Accounting Methodology and the correction of Material Errors

- 12.21** The Dominant Provider must publish and deliver to OFCOM a list of each and every change to the Regulatory Accounting Methodology, by 31 March of the Financial Year in which the change to the Regulatory Accounting Methodology is to be made (the “**Change Control Notification**”). The Change Control Notification must be accompanied by a description of each of the changes, the reason for making each of the changes (including by reference to their compliance with the Regulatory Accounting Guidelines and the Regulatory Accounting Principles), and the impact of each of the changes on the figures at the level of the Markets and Technical Areas (as applicable) by setting out the figures which were presented in the previous Financial Year alongside the figures that would have been presented had such changes been made in the previous Financial Year.
- 12.22** Where in OFCOM's opinion any change referred to in condition 12.21 does not comply with these conditions or the Regulatory Accounting Principles, the Dominant Provider shall not make such change, if so directed by OFCOM.
- 12.23** The Dominant Provider must prepare a reconciliation report as referred to in condition 12.8 and as directed by OFCOM from time to time, which sets out changes to the Regulatory Accounting Methodology and the impact of such changes on the Regulatory Financial Statements, and Material Errors corrected in the Regulatory Financial Statements and the impact of such Material Errors on the Regulatory Financial Statements.
- 12.24** The Dominant Provider must obtain an audit opinion on the reconciliation report as directed by OFCOM from time to time.

Requirements relating to the Regulatory Accounting System

- 12.25** The Dominant Provider's Regulatory Accounting System must be able to produce the Regulatory Financial Statements as directed by OFCOM under condition 12.8 in accordance with these conditions, the Regulatory Accounting Principles and the Accounting Methodology Documents.

- 12.26** Where the Dominant Provider replaces the whole or part of its Regulatory Accounting System, or substantially modifies such Regulatory Accounting System, the Dominant Provider must:
- (i) notify OFCOM in a timely manner of the replacement or modification, and, where so requested by OFCOM, inform OFCOM of progress towards completion and such other information as OFCOM may reasonably request;
 - (ii) ensure, to the best of its ability, that the replacement or modification does not cause the figures contained in the Regulatory Financial Statements to be different from the figures that would have been contained in the Regulatory Financial Statements had such Regulatory Financial Statements been prepared using the old or unmodified Regulatory Accounting System;
 - (iii) in relation to the final Financial Year for which the Regulatory Financial Statements are prepared using the old or unmodified Regulatory Accounting System, prepare a systems reconciliation report, which must:
 - a. set out the difference between the Current Year Figures presented in the Regulatory Financial Statements and the Current Year Figures had such Regulatory Financial Statements been prepared on the basis of the new or modified Regulatory Accounting System, expressed as a percentage change; and
 - b. explain each and every Material Difference between the Current Year Figures presented in the Regulatory Financial Statements and the Current Year Figures had such Regulatory Financial Statements been prepared on the basis of the new or modified Regulatory Accounting System;
 - (iv) publish and deliver the systems reconciliation report to OFCOM by 31 December of the Financial Year for which the figures will be

prepared using the new or modified Regulatory Accounting System for the first time;

- (v) obtain an assurance statement in the form of Agreed Upon Procedures on the systems reconciliation report, which must report:
 - a. whether the figures in the systems reconciliation report referred to in condition 12.26(iii)(a) have been properly extracted from the old or unmodified Regulatory Accounting System and the new or modified Regulatory Accounting System respectively;
 - b. whether each and every difference in the systems reconciliation report referred to in condition 12.26(iii)(a) has been correctly calculated; and
 - c. whether the explanation of each and every Material Difference in the systems reconciliation report referred to in condition 12.26(iii)(b) is an accurate representation of the cause of each such Material Difference.
- (vi) deliver the assurance statement in the form of the Agreed Upon Procedures to OFCOM when it delivers the systems reconciliation report to OFCOM in accordance with condition 12.26(iv).
- (vii) where the systems reconciliation report referred to in condition 12.26(iii) indicates that the replacement or modification causes the Current Year Figures contained in the Regulatory Financial Statements to be significantly different, either individually or in aggregate, from the Current Year Figures that would have been contained in the Regulatory Financial Statements had such Regulatory Financial Statements been prepared using the new or modified Regulatory Accounting System, prepare, if so directed by OFCOM, the Regulatory Financial Statements on a basis consistent with the old or unmodified Regulatory Accounting System.

Requirements relating to deficiencies in the Regulatory Financial Statements and the Accounting Methodology Documents

12.27 Where OFCOM have reasonable grounds to believe that any or all of the Regulatory Financial Statements and/or Accounting Methodology Documents are deficient, the Dominant Provider shall, where directed by OFCOM:

- (i) amend the Accounting Methodology Documents in order to remedy the deficiencies identified by OFCOM;
- (ii) restate the Regulatory Financial Statements identified by OFCOM as requiring restatement in accordance with the Accounting Methodology Documents which have, where necessary, been amended pursuant to condition 12.27(i);
- (iii) prepare a reconciliation report as set out in condition 12.23, whereby any reference to the Regulatory Financial Statements should be understood as a reference to the restated Regulatory Financial Statements;
- (iv) secure in accordance with any relevant notification of OFCOM under this condition the expression of an audit opinion on the restated Regulatory Financial Statements;
- (v) deliver to OFCOM the restated Regulatory Financial Statements, the reconciliation report and corresponding audit opinion; and
- (vi) publish the restated Regulatory Financial Statements, the reconciliation report and corresponding audit opinion.

Requirements relating to the maintenance of sufficient accounting records

12.28 The Dominant Provider shall maintain accounting records for a period of six years from the date on which each Regulatory Financial Statement is delivered to OFCOM.

12.29 The Dominant Provider shall maintain the accounting records in accordance with these conditions, the Regulatory Accounting Principles and the Accounting Methodology Documents.

12.30 The Dominant Provider shall maintain accounting records in a form which, on a historical cost basis and on a current cost basis:

- (i) separately identifies each of the Markets, Technical Areas, Products, Network Components and Network Services;
- (ii) separately attributes the costs, revenues, assets and liabilities of each of the Markets, Technical Areas, Products, Network Components and Network Services; and
- (iii) shows and explains the transactions underlying each of the Markets, Technical Areas, Products, Network Components and Network Services.

12.31 The Dominant Provider shall maintain the accounting records so that they are sufficient:

- (i) to provide an adequate explanation of each Regulatory Financial Statement;
- (ii) to show that charges are non-discriminatory; and
- (iii) to provide a complete justification of the Dominant Provider's charges for Network Access.

Requirement to facilitate on-demand reporting

12.32 The Dominant Provider shall ensure that its Regulatory Accounting System and accounting records are sufficient to enable the Dominant Provider, at all times, to be capable of preparing in relation to any specified calendar month or months a financial statement in accordance with the Accounting Methodology Documents.

Requirements relating to the preparation and maintenance of a Wholesale Catalogue

12.33 The Dominant Provider must prepare, maintain and keep up-to-date a Wholesale Catalogue. Such Wholesale Catalogue should separately identify and describe:

- (i) External Wholesale Services;
- (ii) Internal Wholesale Services;
- (iii) Wholesale Services supplied both externally and internally; and
- (iv) Network Services and the extent to which these activities are used in the course of supplying Wholesale Services.

12.34 The Dominant Provider must deliver an up-to-date version of the Wholesale Catalogue to OFCOM when it delivers the Regulatory Financial Statements to OFCOM in accordance with condition 12.8 and publish such up-to-date version on or before the day of publication of the Regulatory Financial Statements which have been prepared by reference to such version.

Requirements relating to the demonstration of non-discrimination

12.35 The Dominant Provider shall ensure it is able to demonstrate that at any point in time:

- (i) where a Network Service or combination of Network Services is used by the Dominant Provider in providing Internal Wholesale Services, the amount applied and incorporated in the Transfer Charge for the Internal Wholesale Service in respect of the use of the Network Service or combination of Network Services is equivalent to the amount applied and incorporated for the use of the Network Services or combination of Network Services in the charge payable for an equivalent External Wholesale Service;
- (ii) the same amount as applied and incorporated in the Transfer Charge for the Internal Wholesale Service in condition 12.35(i) in respect of the use of the Network Service or combination of Network Services is applied to the Network Service or combination of Network Services whenever it is or they are used

by the Dominant Provider in providing that same Internal Wholesale Service; and

- (iii) the same amount as applied and incorporated in the Transfer Charge for the equivalent External Wholesale Service in condition 12.35(i) in respect of the use of the Network Service or combination of Network Services is applied to the Network Service or combination of Network Services whenever it is or they are used by the Dominant Provider in providing that same External Wholesale Service;
- (iv) the amount applied and incorporated in the Transfer Charge for the Internal Wholesale Service in condition 12.32(i) in respect of the use of the Network Service or combination of Network Services shall be the cost of those Network Services unless the Network Service concerned is provided from a Market which is different from the Market which comprises the Internal Wholesale Service.

12. 37 In this condition 12:

- a) “**Accounting Methodology Documents**” means the documentation maintained by the Dominant Provider setting out in detail the rules, policies, methods, allocations, calculations, assumptions, procedures and Processes used by the Dominant Provider for the purpose of preparing Regulatory Financial Statements in accordance with the Regulatory Accounting Principles;
- b) “**Accounting Policies**” means the manner in which the Dominant Provider applies the requirements the Regulatory Accounting Principles in each of the Regulatory Financial Statements;
- c) “**Alternative Regulatory Auditor**” means any auditor not for the time being appointed as the Dominant Provider’s Regulatory Auditor;
- d) “**Agreed Upon Procedures**” means an engagement carried out in accordance with international standard (ISRS 4400) under which

the Regulatory Auditor or another independent third party performs a set of audit procedures agreed by OFCOM and based on OFCOM's specific requirements in relation to the Regulatory Financial Statements, and reports the findings of that work to OFCOM;

- e) “**Attribution Methods**” means the practices used by the Dominant Provider to attribute revenue (including appropriate Transfer Charges), costs (including appropriate Transfer Charges), assets and liabilities to activities or, insofar as those activities have been aggregated into Wholesale Segments or Retail Segments in a given Market or Technical Area (as applicable), to each Wholesale Segment or Retail Segment;
- f) “**Current Year Figures**” means, in relation to any set of Regulatory Financial Statements, the amounts relating to the Financial Year to which the statements relate;
- g) “**External Wholesale Services**” means services supplied or offered to any Communications Provider other than the Dominant Provider;
- h) “**Financial Year**” means a financial year of the Dominant Provider in respect of which the Statutory Financial Statements are required to be (or to have been) prepared and audited in accordance with the requirements of the Companies Act 2006;
- i) “**ICAEW Guidance**” means the technical release titled “Reporting to Regulators of Regulated Entities: Audit 05/03” issued by the Audit and Assurance Faculty of the Institute of Chartered Accountants in England & Wales in October 2003;
- j) “**Internal Wholesale Services**” means services supplied within the Dominant Provider;
- k) “**Long Run Incremental Cost Methodology**” means the long run incremental cost principles, procedures and Processes which form

the framework under which long run incremental costs are determined by the Dominant Provider;

- l) “**Market**” means the market to which these conditions apply;
- m) “**Material Error**” means a deviation from accuracy or correctness which meets the materiality threshold as directed by OFCOM from time to time for the purpose of these conditions;
- n) “**Material Difference**” means a difference identified in a systems reconciliation report which meets the materiality threshold as directed by OFCOM from time to time for the purpose of these conditions;
- o) “**Network Component**” means an element of the network that is used to provide Wholesale Services, and, to the extent the network components are used in the Market or Technical Area (as applicable), specified in a direction given by OFCOM from time to time for the purposes of these conditions;
- p) “**Network Services**” means those groups of Network Components used directly (or which in the absence of horizontal or vertical integration would be used directly) in the course of supplying Wholesale Services;
- q) “**Prior Year Comparatives**” means, in relation to any set of Regulatory Financial Statements, the amounts relating to the Financial Year immediately preceding the Financial Year to which the Regulatory Financial Statements relate, re-evaluated if necessary to ensure that such figures are comparable to the Current Year Figures;
- r) “**Process**” means the series of inter-related activities or actions to obtain, record or hold data or information or to carry out any operation or set of operations on the data or information, including:
 - i. organisation, storage, adaptation, or alteration of the data or information;

- ii. retrieval, consultation, computation or use of the data or information;
 - iii. disclosure of the data or information by transmission, dissemination, or otherwise making available; or
 - iv. alignment, combination, blocking, erasing or destruction of the data or information;
- s) “**Product**” means any product or service comprised in a Market or Technical Area to which these conditions apply;
- t) “**Regulatory Accounting Methodology**” means the rules, policies, methods, allocations, calculations, assumptions and procedures used by the Dominant Provider for the purpose of preparing Regulatory Financial Statements;
- u) “**Regulatory Accounting Principles**” means the principles as directed by OFCOM from time to time for the purpose of these conditions;
- v) “**Regulatory Accounting System**” means the set of computerised and manual accounting methods, procedures, Processes and controls established to determine and attribute the costs, revenues, assets and liabilities and summarise, interpret, and present the resultant financial data in an accurate and timely manner;
- w) “**Regulatory Auditor**” means the auditor for the time being appointed by the Dominant Provider in accordance with these conditions;
- x) “**Regulatory Financial Statement**” means any financial statement in respect of a Financial Year prepared or required to be prepared by the Dominant Provider in accordance with these conditions;

- y) “**Retail Products**” means services used by or offered to any End Users (including the Dominant Provider);
- z) “**Retail Segments**” means groups of Retail Products;
- aa) “**Statutory Accounting Standards**” means the accounting standards, including the requirements of the Companies Act 2006, by reference to which the Dominant Provider is required to prepare the Statutory Financial Statements;
- bb) “**Statutory Auditor**” means the auditor for the time being appointed by the Dominant Provider in accordance with the requirements of the Companies Act 2006;
- cc) “**Statutory Financial Statements**” means any annual account required to be prepared by the Dominant Provider in accordance with the requirements of the Companies Act 2006;
- dd) “**Technical Area**” means the technical area to which these conditions apply;
- ee) “**Transfer Charge**” means the charge or price that is applied, or deemed to be applied, within the Dominant Provider by one division or business unit of the Dominant Provider to another for the use or provision of an activity or group of activities. For the avoidance of doubt, such activities or group of activities include, amongst other things, Products provided from, to or within the Market or Technical Area (as applicable) and the use of Network Components in the Market or Technical Area (as applicable);
- ff) “**Transfer Charge System Methodology**” means the methodology of the system employed by the Dominant Provider which enables an activity to use a service or good from another activity and to account for it as though it had purchased that service or good from an unrelated party (including accounting for it at an appropriate amount);
- gg) “**Wholesale Catalogue**” means the documentation required to be produced by the Dominant Provider under condition 12.33;

- hh) **“Wholesale Segments”** means groups of Wholesale Services;
and

- ii) **“Wholesale Services”** means services related to network access on the Dominant Provider’s network used by or offered to any Communications Provider (including the Dominant Provider).