Wholesale Local Access Market Review

Initial proposals to develop an effective PIA remedy

NON-CONFIDENTIAL VERSION

Consultation

Publication date: 6 December 2016

Closing Date for Responses: 31 January 2017

About this document

This consultation follows our Digital Communications Review (DCR) and a progress update published in July on supporting investment in ultrafast broadband networks.

The consultation concerns Openreach's duct and pole access product, known as Physical Infrastructure Access (PIA). It builds on Openreach's process improvement trials for PIA, conducted with the Office of the Telecommunications Adjudicator and five other telecoms providers, as well as our positive engagement with stakeholders since the DCR was published. It links the commitments made in the DCR to specific actions, setting out our initial views on what Openreach's PIA product could be used for, how it should work in terms of processes, and how charges could be set. We explain how each of these areas in combination will help address concerns regarding barriers to investing in ultrafast broadband networks at scale.

We are in the process of reviewing the Wholesale Local Access (WLA) market, and intend to set out our full proposals in the spring of next year in light of our market analysis. In order to consider the full breadth of possibilities before making proposals, we are looking to develop options regarding PIA which may be appropriate to address any competition problems subsequently identified in the market review. We are therefore seeking input from stakeholders in this consultation to help us do this.

This consultation will close on 31 January 2017. Please send your responses via our web form.

Contents

Section 1

Executive summary

Our strategic vision for network competition

1.1 In February 2016, we published our Strategic Review of Digital Communications and set out a ten-year vision for ensuring the quality and availability of communications services in the UK. This vision includes the UK moving towards a future with widespread availability of competing networks, and the UK being a world leader in the availability and capability of its digital networks, delivering benefits to people and businesses in terms of choice, innovation and affordable prices.

1.2 One of our key proposals is to make a strategic shift to encourage investment in the large-scale deployment of new ultrafast broadband networks, including fibre direct to homes and business premises (sometimes called 'full-fibre'), as an alternative to the predominantly copper-based technologies currently planned by BT. We believe network competition is the most effective spur for continued investment in high quality, fibre networks.

1.3 Recently there has been significant interest in fibre investment by various parties. For example, by 2020, BT is planning up to 2m fibre-to-the-premises (FTTP) deployments and Virgin Media intends to extend its network to reach a further 4m premises, half of which are to be connected using FTTP. In addition, TalkTalk / CityFibre have recently announced their intention to extend the FTTP 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 100,000 premises with FTTP.

1.4 However, competitors to BT looking to deploy ultrafast broadband at scale continue to express concerns about the absolute costs and time required to build these networks, and uncertainty over generating a sufficient return on their investment.

1.5 We want to make it easier and more cost effective for telecoms providers to invest in advanced, competing infrastructure by improving duct and pole access (DPA): access to the network of poles and underground ducts that carry telecoms cables. This will help enable telecoms providers to deploy their own fibre optic cables directly to homes and businesses more quickly and at lower up-front cost. The government also wants to see greater fibre roll out to more homes and businesses and therefore has announced initiatives to simplify planning rules and provide 100% business rates relief for new fibre infrastructure for five-years from 1 April 2017.

1.6 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 Regulations. We are publishing guidance on our role in this process alongside this consultation. However, we understand the greatest interest for broadband deployment remains in using Openreach'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).

1.7 We are in the process of reviewing the Wholesale Local Access (WLA) market. We intend to set out our full proposals for the WLA market in the spring of next year in light of our market analysis. In order to consider the full breadth of possibilities before making proposals, we are looking to develop options regarding PIA which may be

appropriate to address any competition problems subsequently identified in the market review. We are therefore seeking input from stakeholders in this consultation to help us do this.

Developing an effective PIA remedy

1.8 The Digital Communications Review proposed five actions to address the challenges faced by other telecoms providers in using Openreach's ducts and poles. These are: equivalence of inputs to be achieved between BT and other telecoms providers; usage restrictions to be removed where PIA is used to deploy network to residential consumers at scale; pricing of PIA to be reviewed, including ancillary service charges as required; better information to be provided by Openreach, via an online database of ducts and poles assets; and efficient operational processes to be ensured through appropriately streamlined processes.

1.9 Openreach has acknowledged the need to examine limitations with the current PIA processes and, with five smaller telecoms providers, has initiated a trial of various process changes that it anticipates will become business as usual from early 2017. In addition, by mid-2017 Openreach intends to make available an online database tool for telecoms providers that will show the location of duct and pole infrastructure and an indication of available capacity. While we welcome this as a good first step, we consider that more needs to be done to ensure the PIA remedy is effective.

1.10 In this document we consider what might be required for the PIA remedy to be effective. In doing so, we have assessed those areas where other telecoms providers need to be on a level playing field with BT's downstream businesses when it comes to accessing Openreach's physical infrastructure. In certain areas, our preliminary view is that equivalence between BT and other telecoms providers is key to achieving this objective, both in terms of processes and cost recovery.

- Processes: BT should use the same processes and systems as other telecoms providers, effectively consuming PIA itself as far as practicable, when installing fibre in its own ducts for scale deployment of ultrafast broadband services; and

- Cost recovery and charging: BT should recover physical infrastructure costs (e.g. duct repairs) arising from use by other telecoms providers in the same way it recovers such costs arising from its own use – for example, by spreading these costs across all services which make use of the duct.

1.11 In this consultation we are exploring three areas: how PIA can be used and the potential to relax current usage restrictions; how PIA should work in terms of simplified and less costly processes; and how PIA should be priced, helping to support competitive investment.

How PIA can be used

1.12 The current PIA remedy 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).

1.13 However, stakeholders have argued that the investment case for deploying a competing ultrafast broadband network is questionable unless they are able to benefit from the additional revenue opportunity and economy of scope offered by delivering both ultrafast broadband and point-to-point leased lines over the same

network. In addition, as the technology supporting FTTP services develops, it can be increasingly difficult to distinguish between an ultrafast broadband connection and a leased line. Regulatory rules that permit one type of technology or network architecture, but not another, risk distorting market developments and may impede innovation.

1.14 One option may be to relax the current PIA usage restriction to allow 'mixed use' so that provided PIA is used to deploy a broadband access network to residential consumers at scale, the same network can then be used to also deliver leased line services. This type of rule would help to safeguard against the use of PIA to sell high margin leased lines only. However, there may also be practical challenges in designing a specific rule of this nature.

1.15 Another option, which would be simpler to implement, would be to relax the current usage restrictions to allow 'any usage' within the local access area. This approach would provide greater certainty to potential network investors. It would also deliver greater equivalence to BT, as other telecoms providers would have fewer barriers which might prevent them from deploying ultrafast broadband networks, such as restricting the services that can be provided. However, there may be risks to the effectiveness of this intervention if it results in less incentive to deploy ultrafast broadband networks, as opposed to point-to-point leased lines only, which in turn would potentially reduce duct capacity for ultrafast broadband.

1.16 We are keen to receive views on how best to enable greater flexibility in the use of PIA while taking into account the design and practical challenges and ensuring that the remedy is effective in facilitating investment in large scale deployment of new ultrafast broadband networks.

How PIA should work

1.17 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. Having examined the current PIA processes at each of these stages and potential associated issues, our initial views on changes to improve these processes are as follows.

Planning and surveying

1.18 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. Surveying, involving a visual inspection of the infrastructure, is also typically necessary to verify that planning assumptions are accurate.

1.19 It would appear from our review that there are currently a number of issues: telecoms providers do not have easy or adequate access to Openreach's network records; highly manual processes are not fit for scale use; and overly-onerous survey requirements are imposed on other telecoms providers in comparison to the processes BT faces itself.

1.20 Our current view is that detailed network records (including an indication of spare capacity, and more granular information such as pole sizes and the number of duct bores) should be provided in a digital format suitable for importing into telecoms providers' geographic network planning tools. We also consider that the survey

requirements can be streamlined and part automated, reflecting the by-exception survey process (where only deviations from the plan are reported) that BT itself uses.

1.21 We recognise that Openreach has taken initial steps to improve the current processes, both through its intention to make an online database available to other telecoms providers, as well as by testing some simplified processes as part of its ongoing trial with five telecoms providers. We believe that our proposed changes to this stage of the process will improve efficiency, reduce costs, and shorten the time required for other telecoms providers to plan access network deployments.

Network deployment

1.22 Operationally, network deployment includes build works (installing new infrastructure capacity if necessary), enabling works (clearing blocked ducts) and installing the access network (for example, laying fibre optic cables).

1.23 Currently Openreach undertakes all build works and enabling works on its infrastructure. Telecoms providers must therefore stop work if there is a requirement for build or enabling works, introducing delay and uncertainty in terms of the time to complete network deployment. Further, telecoms providers currently pay the full upfront cost of any build or enabling works requested to improve Openreach's infrastructure.

1.24 We consider that other telecoms providers should have greater certainty regarding timescales and, like BT itself, be able to avoid the delays of a sequential process that iterates back and forth with Openreach. This could be achieved by providing them with greater certainty about when build works will be completed by Openreach, for example by introducing service level agreements and guarantees; or by allowing them to undertake build and enabling works on Openreach's infrastructure themselves. In the case of self-provision of build works we would anticipate this work being undertaken by appropriately accredited civil engineering contractors, charged to Openreach, with Openreach not facing higher costs than if it did the work itself. Under either approach we would expect BT to recover the costs of build and enabling works in the same way it recovers such costs arising from its own use.

1.25 We recognise that in providing other telecoms providers with greater flexibility to undertake infrastructure work associated with their network deployment, Openreach should be able to maintain sufficient control over these works, with appropriate approval mechanisms, given the infrastructure remains Openreach's asset. We are interested in responses to our initial views on meeting these objectives.

Connecting the customer

1.26 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. Given specific constraints regarding overhead (vs underground) lead-ins there may be merit in considering a different regulatory approach for poles and overhead lead-ins.

1.27 A number of telecoms providers have said that while the existing PIA remedy allows the use of Openreach poles, the effectiveness of pole sharing may be limited by space and load bearing capacity constraints. While options exist when there is insufficient existing pole capacity, such as strengthening the existing pole or installing a larger pole, a telecoms provider then faces significant upfront costs and time for the

work to be completed which may present a material barrier. In contrast, if Openreach wanted to connect a home with fibre, it could simply replace the existing copper dropwire with a fibre dropwire (or a hybrid fibre/copper dropwire if it wished to maintain the copper connection).

1.28 One approach is to allow telecoms providers to access Openreach's own dropwires with Openreach then responsible for upgrading the existing copper dropwire to a hybrid fibre/copper dropwire at the request of a telecoms provider (when they are seeking to connect a customer as a result of a new sign up to their fibre service). When upgrading the dropwire, Openreach would reconnect the copper connection to ensure continuity of service while leaving the fibre connection available for the gaining telecoms provider to complete the end-to-end installation and switching of service. Under this approach, Openreach would retain ownership of the hybrid dropwire and charge rental to the telecoms provider for its use.

1.29 In our initial view there are a number of attractions of this approach: unlocking scarce 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 Openreach's poles.

1.30 We recognise that this approach would raise a number of complexities that will need to be resolved if taken forwards. For example, Openreach would need to develop a set of processes, and a technical solution, to allow it to respond to a telecoms provider's request for a dropwire upgrade. We are interested in views on whether this is likely to be an effective and viable way of addressing challenges associated with pole sharing. In the event of positive feedback we will examine implementation details and cost recovery in our subsequent WLA market review consultation.

How PIA pricing can support competitive investment

1.31 In the Digital Communications Review while we observed that existing PIA rental charges are considered to be broadly in line with international comparisons, we committed to review pricing to ensure the PIA remedy is effective.

1.32 We have considered a number of issues including rental and ancillary charges.

- Rental charges: while current PIA prices must be cost oriented, 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. For the period under review, one approach may be to set an explicit charge control based on the current methodology for calculating PIA rental prices. We are interested in views on this approach. If the current methodology for calculating PIA rental prices remains the basis for pricing, we consider that the component of PIA rental charges which reflects the costs of setting up the PIA remedy should be removed from rental prices and recovered under an alternative method.

- Ancillary charges: some stakeholders have raised concerns about a number of ancillary charges levied by Openreach, such as attendance during a survey or charges for enabling works. In a number of cases these charges can be avoided, for example by telecoms providers undertaking the relevant work themselves. Other ancillary charges may become less important or fall away completely given our other proposals. We propose to focus on unavoidable ancillary charges which are likely to be more material. We value input from stakeholders on which charges are likely to be most significant.

Next steps

1.33 Following responses to this initial consultation on developing an effective PIA remedy, we intend to set out our full proposals for the WLA market in the spring of next year.

Section 2

Introduction

Background to this consultation

Our DCR strategy

2.1 In February 2016, we published our Digital Communications Review (DCR) setting out our approach to regulating communications markets for the next decade. It explains how we will promote investment and competition to ensure that people and businesses get the phone, broadband and mobile services they need in coming years, wherever they live and work.[1] Our strategy focuses on five broad areas:

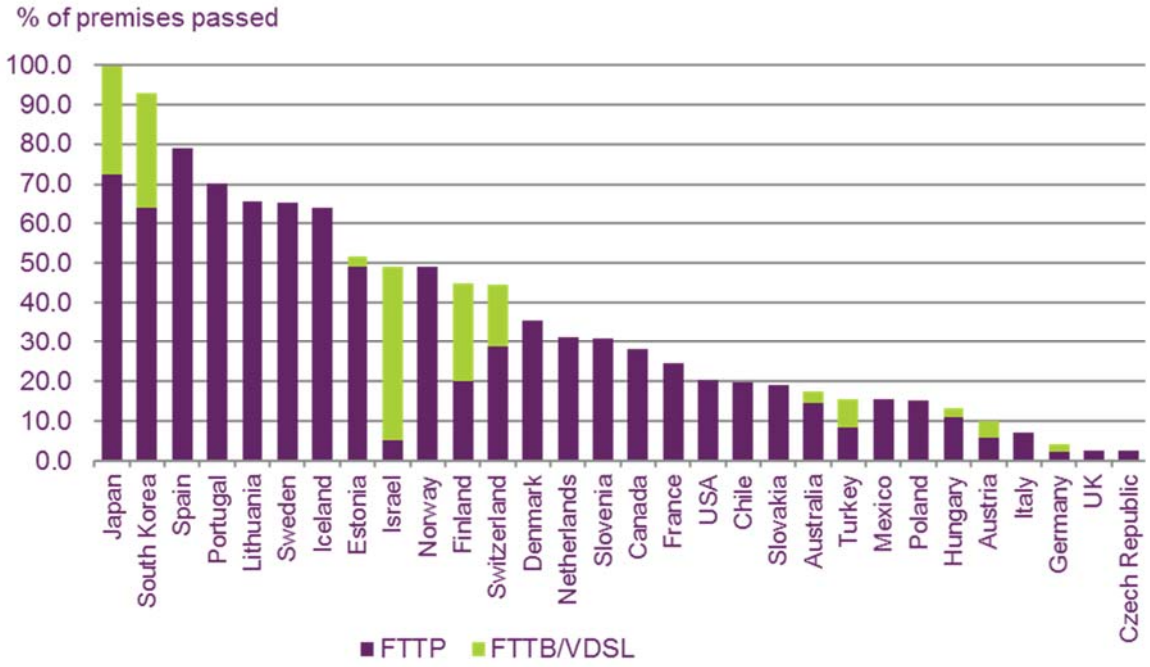
- the guarantee of universal broadband availability at a sufficient speed to meet modern consumer needs;
- support for investment and innovation in ultrafast[2] broadband networks (such as fibre to homes or businesses) by giving BT's competitors improved access to its infrastructure;
- improvements in the quality of service delivered by the whole of the telecoms industry, including Openreach, BT's access network division;
- increased independence of Openreach from BT so that it is more responsive to all of its customers; and
- greater consumer empowerment so that people can understand the array of choices available to them and are able to switch to the best value deal easily.

2.2 At the heart of our strategy is a major strategic shift to encourage investment in new ultrafast networks, including fibre direct to homes and businesses, as an alternative to the predominately copper-based technologies currently planned by BT.

2.3 While, overall, the UK is performing well against European and global peers on a number of measures, including the availability and take-up of superfast broadband, the UK is notable for its very limited availability of ultrafast broadband services, including those based on fibre-to-the-premises (FTTP). On this metric, it compares poorly with the majority of our global peers, as shown in Figure 1.

[1] 2016 DCR Statement, available at https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/policy/digital-comms-review/conclusions-strategic-review-digital-Communications.
[2] 2016 DCR Statement, paragraph 3.13: We currently take ultrafast broadband services to be those that offer a minimum download speed of 300Mbit/s or more (a factor of ten greater than that offered by superfast).

Figure 1: Fibre coverage to premises in OECD nations, end-2016



Source: Analysys Mason, November 2016. Note: Analysys Mason figures are based on actuals until September 2016 (where available) and forecasts for the rest of the year. FTTB/VDSL is fibre-to-the-building where in-building distribution is via VDSL (very high bit rate digital subscriber line) over copper connections.[3]

2.4 In our view, network competition is the most effective spur for continued investment in high quality, fibre networks. In our DCR, the analysis of network deployment across a number of different countries indicated that the scale of fibre-to-the-premises 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, while also reducing the UK's reliance on the Openreach network.

2.5 In encouraging network based competition, our strategy recognises that this may, in turn, spur BT to increase its own investment in ultrafast, leading to better outcomes for consumers through increased coverage and competition.

Overview of current ultrafast networks

2.6 Ultrafast broadband infrastructure can take a number of forms and be delivered over different technologies. Our ambition is to maximise the reach of new network investment, which is increasingly likely to be in FTTP networks given their greater degree of future-proofing and better reliability over alternative approaches.

[3] Some 2016 data may be inconsistent with data presented in the 2016 DCR Statement. This is due to restatement of some 2015 data by Analysys Mason.
[4] 2016 DCR Statement, paragraphs 4.11; see also paragraphs 4.20-4.25.

2.7 BT is planning up to 2m FTTP deployments by the end of 2020 including to small businesses in Bradford,[5] alongside its intention to upgrade further its copper network using a new DSL standard called G.fast which it has said could deliver broadband speeds of 300-500Mbit/s.[6] Virgin Media, who operates the second largest broadband network in the UK, has announced trials of a new cable technology ("DOCSIS 3.1"), noting that this could deliver speeds of up to 10Gbit/s. In addition, its 'Project Lightning' deployment is underway with plans to reach a further 4m additional premises by 2020, of which at least 2m will be connected using FTTP.[7]

2.8 Beyond BT and Virgin Media, deployment of ultrafast broadband to date has been limited in scale, with smaller providers focused on niche markets such as villages located far from BT exchanges[8] or new-build apartments in urban areas.[9] However, TalkTalk / CityFibre have recently announced their intention to extend the FTTP York trial from 14,000 homes to cover 40,000 premises over the next 18 months.[10] In addition, KCOM in Hull is currently upgrading its FTTP network to pass 100,000 premises with fibre.

Improving DPA will help remove barriers to network investment

2.9 Telecoms providers interested in deploying ultrafast broadband networks at scale consider there to be a number of barriers to scale investment, and have expressed concerns about:

- the absolute costs, and the time required to build new networks;
- the uncertainty of generating a sufficient return on their investment; and
- the comparative benefits over purchasing regulated products from Openreach.

2.10 We want to make it easier and more cost effective for telecoms providers to invest in advanced, competing infrastructure by improving duct and pole access (DPA): access to Openreach's network of poles and underground ducts that carry telecoms cables. BT's competitors will then be able to connect their own fibre optic cables directly to homes and businesses more quickly and at lower up-front cost. This requires substantial improvement in how Openreach provides access to its infrastructure.

2.11 The DCR proposed five actions to address the challenges faced by other telecoms providers in using Openreach's ducts and poles:

- **equivalence of inputs**: achieving an equivalence of inputs between BT and other telecoms providers;

[5] See BT press release http://home.bt.com/news/bt-life/openreach-expands-ultrafast-fibre-plans-11364045256060.
[6] BT press release, 22 September 2015 and 8 November 2016.
[7] See Virgin Media press release http://www.libertyglobal.com/pdf/press-release/Virgin-Media-Fixed-Income-Q3-2016-FINAL.pdf.
[8] For example, Gigaclear.
[9] For example, Hyperoptic.
[10] See TalkTalk press release https://www.talktalkgroup.com/articles/talktalkgroup/2016/October/Ultra-Fibre-Optic-Trial-set-to-cover-the-whole-of-York.

- **usage restrictions**: removing usage restrictions where DPA is used to deploy network to residential consumers at scale;
- **pricing**: reviewing pricing of DPA, including ancillary service charges, as required;
- **better information**: requiring Openreach to provide an online database of ducts and poles assets; and
- **efficient operational processes**: ensuring operational processes are efficient, appropriately streamlined and established early.[11]

Progress on DPA

2.12 We have started to implement the first steps of this strategy and respond to telecoms providers' concerns in a number of ways, including through:

- improving access to Openreach's ducts and poles;
- the recently introduced Communications (Access to Infrastructure) Regulations 2016[12] (the ATI Regulations); and
- working with government on a number of initiatives including planning reform.

2.13 In July we published a progress update where we set out an overview of our programme of work and how we are engaging with Openreach and industry.[13] We highlighted areas where there have been positive developments in addressing the practical aspects of ensuring better information and efficient operational processes.

2.14 In parallel to any regulatory obligations imposed on BT following our market reviews, telecoms providers can gain access to physical infrastructure through the ATI Regulations. These measures are designed to reduce the cost of deploying broadband networks by facilitating access to physical infrastructure across different sectors (such as electricity, water and transport services, as well as telecoms). We consulted on draft guidance in relation to these new measures in July 2016, and have published a final statement alongside this consultation. The ATI Regulations are distinct from the market review framework (which is the basis for the existing DPA obligations on BT) and will therefore co-exist with SMP regulation, as they create a series of rights and corresponding obligations which provide a basis for commercial negotiations. Should a network provider seeking access and the physical infrastructure owner fail to agree, the ATI Regulations provide a dispute resolution regime under which Ofcom is the dispute resolution body. Uncertainties as to the likely impact of the ATI Regulations remain and any future proposals on a PIA remedy will need to take account of the ATI Regulations including those uncertainties.

2.15 The commercial case for deploying ultrafast broadband networks also depends on a number of factors that fall within government's remit, including: business rates, Local

[11] 2016 DCR Statement, paragraph 4.30.
[12] 2016 No. 700 Electronic Communications, The Communications (Access to Infrastructure) Regulations 2016.
[13] July 2016 DPA Progress Update, available at https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/policy/digital-comms-review/duct-and-pole-access.

Authorities' approval processes for planning and street works, and securing wayleaves for access to private property from landowners (e.g. in order to install cabling in an apartment block). The government's Digital Economy Bill,[14] published in July 2016, with Royal Assent expected in spring 2017, has a number of measures to support the ambition for the UK to be a world leader in the digital economy. For example, one of the main elements of the bill 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.

2.16 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 full-fibre connections and future 5G communications.[15] These initiatives include 100% business rates relief for new full-fibre infrastructure for a five-year period from 1 April 2017, designed to support roll out to more homes and businesses.

Review of the Wholesale Local Access market

2.17 In 2014, we reviewed the Wholesale Local Access (WLA) market as part of our Fixed Access Market Review (FAMR). We concluded that in the UK, excluding the Hull Area, BT had Significant Market Power (SMP) in the WLA market and that remedies were necessary.[16]

2.18 We imposed a duct and pole access remedy, known as Physical Infrastructure Access (PIA), which requires Openreach to provide access to its local access network of underground ducts and poles.

2.19 We are now reviewing the WLA market again. This review is considering the scope of the relevant market and whether BT retains SMP in it. The review will also consider what remedies should be imposed if we find a party holds SMP.

2.20 We are planning to consult on market definition, SMP assessment and proposed remedies in relation to the provision of WLA, in spring 2017. We then expect to finalise the conclusions from our WLA market review during the course of 2017.

2.21 At this stage we are not seeking views on whether regulation ought to be imposed in the WLA market and, if so, what this regulation should be. However, in order to progress our review of the WLA market, and to be able to consult fully on such remedies as may be appropriate, we consider it necessary to gain a better understanding of the ways in which the current PIA remedy could be made more effective. This consultation document sets out some initial views and possible approaches for improving the current PIA remedy. In doing so, the discussion presented in this document proceeds on the assumption that the WLA market review will continue to find BT to have SMP on a wholesale local access market and a PIA remedy is required to address the competition issues arising out of this SMP. For the

[14] Digital Economy Bill 2016, available at https://www.gov.uk/government/collections/digital-economy-bill-2016.
[15] HM Treasury, 2016 Autumn Statement, paragraph 4.7 available at https://www.gov.uk/government/publications/autumn-statement-2016-documents/autumn-statement-2016
[16] 2014 FAMR Statement, Volume 1, available at https://www.ofcom.org.uk/phones-telecoms-and-internet/information-for-industry/telecoms-competition-regulation/narrowband-broadband-fixed/fixed-access-market-reviews-2014.

avoidance of doubt, this assumption is without prejudice to the outcome of the market analysis we are undertaking in the WLA market review.

2.22 In the event that the WLA market review determines BT to have SMP in any relevant market, we will then set out our detailed proposals for appropriate remedies to address the identified competition problems as part of our WLA market review consultation in 2017. Our analysis of the full proposals presented in that document will constitute an impact assessment as defined in section 7 of the Communications Act.

History of PIA

2.23 We introduced the PIA remedy following our review of the WLA market in 2010.[17] The remedy required Openreach to allow third parties to deploy superfast and ultrafast broadband networks[18] using its physical infrastructure (ducts and poles)[19] located in the local access network.

2.24 However, there has been limited take-up of PIA to date in the UK. The PIA remedy imposed in 2010 was designed to facilitate telecoms providers wishing to offer services in advance of BT roll-out of superfast broadband infrastructure, particularly in locations which were eligible for public funding support.[20] For the first phase of public contracts, while there was interest from competing providers to BT, this subsequently failed to materialise.[21]

2.25 Following publication of the DCR, BT has acknowledged the need to examine limitations with the current processes related to accessing Openreach's ducts and poles. Through engagement with an industry working group, and five smaller telecoms providers, Openreach has initiated a 'Proof of Concept' trial of various process changes that it anticipates could become business as usual from early 2017. The changes implemented include:

- allowing a telecoms provider to undertake a survey and deploy their network using Openreach's infrastructure in a single stage (as opposed to the current process which requires a survey to be completed by the telecoms provider and subsequently approved by Openreach in advance of any network deployment);

- allowing a telecoms provider some flexibility to make deviations from the originally agreed route when deploying a network, e.g. in response to finding obstacles;

[17] 2010 WLA Statement, Section 7, available at https://www.ofcom.org.uk/__data/assets/pdf_file/0027/37935/wla_statement.pdf.
[18] In the 2010 WLA Statement we said that the PIA remedy would require BT to allow third parties to deploy "NGA networks". For the purposes of this consultation, NGA networks means superfast and ultrafast broadband networks. This is consistent with Art 11 of the EU NGA Recommendation according to which NGA means a wired access network which consist wholly or in part of optical elements and which is capable of delivering broadband access services with enhanced characteristics (such as higher throughput) as compared to those provided over already existing copper networks.
[19] We specified that 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. See 2010 WLA Statement, Condition FAA12.4(h).
[20] 2010 WLA Statement, paragraph 1.6.
[21] Broadband Delivery UK developed a delivery framework to assist in the public procurement process. While the framework contract for Phase 1 was signed by suppliers BT and Fujitsu, Fujistu later withdrew.

- allowing a telecoms provider to undertake its own duct clearing works (e.g. where ducts are blocked or collapsed) without Openreach's intervention; and

- allowing a telecoms provider to install a wider range of cable joints in Openreach manholes and joint boxes.

2.26 Alongside the Proof of Concept trial, by mid-2017 Openreach is intending to make available an online planning tool for telecoms providers that will provide the location of duct and pole infrastructure and an indication of available capacity in Openreach's ducts.[22] This represents a significant improvement in the amount of network information being made available to other telecoms providers, but its usefulness as a network planning tool will depend on the precise technical specification.[23]

Document structure

2.27 The rest of this document is structured as follows:

- **Section 3: Developing an effective remedy** – our consideration of the main principles of an effective duct and poles access remedy, namely, equivalence of process and cost recovery;

- **Section 4: PIA scope** – our initial views and possible approaches in relation to the relaxation of the current restrictions on PIA uses;

- **Section 5: PIA process** – our initial views and possible approaches to improving the systems for provision of network information, and processes which telecoms providers have to follow when requesting and using PIA; and

- **Section 6: PIA pricing** – our initial views and possible approaches in relation to the pricing of PIA.

[22] From our discussions with Openreach it appears that telecoms providers will have the ability to import a limited amount of information into their own planning tools.
[23] For example, factors such as limits on the number of users that can access a system; limits on the volume of information that can be accessed by a user; and how often and how quickly information is updated in the system will impact its usefulness.

Section 3

Developing an effective PIA remedy

The aims of the PIA remedy

3.1 To the extent that we might find that BT continues to have SMP in the wholesale local access markets in the next market review period, it may be appropriate to impose a PIA remedy to address the competition problems arising from BT's SMP in order to promote competition and investment in new access networks.

3.2 Physical infrastructure (underground ducts and poles) is costly to deploy and constitutes a large proportion of the overall capital expenditure of an access network. BT has an extensive physical infrastructure access network that reaches most homes and businesses in the UK. BT's ability to reuse this legacy infrastructure, much of which predates market liberalisation, gives it a significant advantage over its competitors. Therefore, allowing BT's competitors to use this physical infrastructure would remove a significant barrier to infrastructure deployment and would put BT's competitors on a more similar footing to BT.

3.3 Where BT continues to have SMP it is likely that Openreach would have the incentive and ability to favour its own downstream business 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 physical infrastructure access, Openreach 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 business.

Access should be provided on an equivalent basis

3.4 The combination of BT's market power and vertically integrated structure would mean that BT has the incentive to discriminate against competing telecoms providers when providing access to its physical infrastructure.

3.5 In the DCR, we said that in order to improve Openreach's incentives to deliver an effective DPA product, we will work to apply equivalence of inputs (EOI) to Openreach's provision of DPA, requiring Openreach to provide DPA to all telecoms providers (including other parts of BT) in the same way. An EOI obligation is a strict form of non-discrimination obligation that is designed to prevent BT from discriminating against its competitors by requiring it to provide exactly the same product to all telecoms providers including its own downstream divisions. 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. In the DCR, we said 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.[24]

[24] The Commission's Recommendation on next generation access (NGA) sets out that access to civil engineering infrastructure should be provided on a strictly equivalent basis. http://eur-lex.europa.eu/LexUriServ/%20LexUriServ.do?uri=OJ:L:2010:251:0035:0048:en:PDF

3.6 Currently, when BT 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 BT to productise the use of duct at scale, suitable for consumption by both BT and other telecoms providers.

3.7 Moreover, PIA is not a single standard product but comprises a number of processes and sub-products.[25] Therefore ensuring EOI for PIA will require EOI at each stage of the process that BT and other telecoms providers undertake. This would mean that BT would be required to re-engineer its own internal processes and systems significantly if it consumed its physical infrastructure on a completely equivalent basis.[26]

3.8 Whilst ensuring strict equivalence remains a long term objective, for the reasons set out above, we recognise that this may be costly and disruptive, and is likely to take considerable time. Assuming a PIA remedy is appropriate, our focus is on getting an effective remedy established as quickly as possible so that other telecoms providers can start making use of it. Therefore, we are not proposing to impose a full EOI obligation on BT to consume PIA as an input to other services at this point in time.

3.9 However, our concern remains 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 are considering what form of non-discrimination remedy might be required to address such a concern.

3.10 Our initial view is that when BT installs ultrafast broadband services itself at scale (for example, when extending its G.fast service beyond its current cabinet footprint or deploying FTTP) BT should be required to use 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.

3.11 In developing our more immediate proposals for an effective PIA remedy, we have applied the principle of equivalence with the aim of ensuring that other telecoms providers are not at a material disadvantage compared to BT's own internal consumption of duct and pole access.

3.12 We have therefore focussed our attention on two main areas of equivalence, which we think are critical to the effectiveness of the PIA remedy:

- equivalence in processes; and
- equivalence in cost recovery and charges.

The principle of equivalence applied to processes

3.13 The processes that other telecoms providers are required to follow to access Openreach's physical infrastructure should not put them at a disadvantage compared

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Strict equivalence would ensure a level playing field between other telecoms operators and BT's downstream businesses. It would also provide BT with a strong incentive to address any deficiencies in the PIA product, as these deficiencies would be felt by BT itself.

[25] 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 their network using Openreach's infrastructure.

[26] Full equivalence might also mean imposing an additional regulatory boundary within Openreach.

to the processes BT follows internally. Where differences in processes mean that a competing telecoms provider faces extra cost, time or uncertainty, this undermines the effectiveness of the PIA remedy.

3.14 In developing our proposals, we have examined the existing PIA processes and compared this to the approach BT follows internally. In doing this we have been mindful of the need for BT to have sufficient control over its physical infrastructure, while not undermining the effectiveness of the PIA remedy.

The principle of equivalence applied to cost recovery and charges

3.15 The way that Openreach recovers costs related to the use of its physical infrastructure (i.e. the way in which it sets charges) should not put other telecoms providers at a disadvantage compared to BT's internal consumption. This includes the contribution that users of the physical infrastructure make to the recovery of the costs of the existing physical assets (through rental charges), as well as the recovery of any additional costs incurred by BT in meeting the requirements of the PIA remedy (e.g. systems development costs, costs of repairing ducts and installing new duct capacity).

3.16 For example, where BT spreads costs arising from its internal consumption across all services which use duct (e.g. capitalised duct repair costs), the principle of equivalence suggests that similar costs arising from external consumption should be recovered in the same way.[27] Without this requirement, other telecoms providers using Openreach's infrastructure to install their own fibre face very different upfront costs to those faced by BT's downstream businesses, with potentially significant implications for the viability of their business case. This is because, unlike other telecoms providers accessing Openreach's infrastructure, BT can spread costs such as duct repairs (when capitalised) over all infrastructure users. As a consequence, the costs of infrastructure investment specifically allocated to any new fibre installation are lower, lowering the risks of that investment. This difference is likely to place other telecoms providers at a material competitive disadvantage, undermining the effectiveness of the PIA remedy.

Initial perspectives on equivalence

3.17 Having considered the above, we have identified a number of 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. In turn these disadvantages may hinder the investment case, for example, limiting the extent of ultrafast broadband network roll out. These disadvantages, which we explore later in this document, may include:

- **Usage restrictions**: telecoms providers are unable to use PIA to provide services to larger businesses, limiting the business models they can adopt;
- **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;

[27] These services may include leased line products, and residential broadband products.

- **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

- **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.

Question 3.1: Do you agree with our aim of ensuring that other telecoms providers are not at a material disadvantage compared to BT's own internal consumption of duct and pole access?

Question 3.2: Do you agree with our approach to focus on two main areas of equivalence, processes and costs?

Question 3.3: Do you agree that when BT installs ultrafast broadband services itself at scale it should use the same processes and systems as those used by other telecoms providers that consume PIA as far as is practicable?

Section 4

PIA scope

Why we are considering the scope of PIA

4.1 The current PIA remedy 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).[28]

4.2 When the PIA remedy was first introduced, our intention was that PIA would not be used for leased lines but rather to deploy FTTC and FTTH broadband networks to business and residential premises.[29]

4.3 More specifically, in 2010 we established that PIA could be used for the deployment of access networks for broadband and telephony services as well as for sub-loop unbundling (SLU) backhaul (connections between street cabinets and Openreach's local exchanges).[30] We also found that "*extending the scope of PIA to include leased lines would be unlikely to stimulate much additional investment in next generation access networks in the short term*".[31] In the subsequent 2014 market review we concluded again that it was not appropriate to broaden the scope of a duct and pole access remedy for leased lines use.[32]

4.4 In the DCR 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.*"[33]

4.5 Since publishing the DCR in February, we have engaged with stakeholders to better understand the extent to which the current PIA usage restrictions discourage investments in ultrafast broadband networks. Stakeholders have informed us that relaxing these restrictions is key for supporting their network investment case.

4.6 In particular, they argue that ultrafast broadband network build is likely to be viable in areas which coincide with demand for point-to-point business connections and that the additional revenue opportunity and economy of scope offered by delivering all

[28] The scope of the current PIA remedy is limited to use "*for the purposes of deployment of broadband access networks serving multiple premises*". Ofcom, FAMR 2014, Legal instrument, Condition 2.1A, "Physical Infrastructure Access for the use by the requesting Third Party for the purposes of deployment of broadband access networks serving multiple premises", see https://www.ofcom.org.uk/__data/assets/pdf_file/0033/78837/annex_29.pdf
[29] Paragraph 7.13 of Wholesale Local Access market review 2010, https://www.ofcom.org.uk/__data/assets/pdf_file/0027/37935/wla_statement.pdf
[30] Paragraph 7.58 of Wholesale Local Access market review 2010.
[31] Paragraph 7.60 of Wholesale Local Access market review 2010.
[32] Section 2.4 of BT's PIA Reference Offer specifies that PIA can be used for FTTC (including SLU backhaul) and FTTP deployments; it cannot be used for core and backhaul links as its use is limited to the local access, between the end-user and BT's local access node or the provider's point of presence as long as this is located within the same radial distance of BT's local access node (BT has about 1,000 fibre local access nodes in the UK).
[33] Ofcom, "Making Communications work for everyone", February 2016, paragraph 4.30.

types of services over the same network is required for a viable business case based on PIA.

4.7 We also note that many European countries have mandated duct access without imposing specific restrictions on usage.[34] Previous research commissioned by Ofcom suggests that there may be practical reasons for the absence of usage restrictions in other countries, including:

- enforcing a usage restriction on duct access is a difficult task in practice; and
- the consolidation of the market resulting in broadly the same telecoms providers offering fixed and mobile broadband for people and businesses may render the usage distinctions impractical.[35]

4.8 Based on this, we have collected further evidence and conducted additional analysis. The results are summarised below.

Drivers for broadening uses of PIA

Innovation, higher flexibility and technology neutrality

4.9 Broadband connections typically offer contended and asymmetrical access, i.e. each single connection is shared with other users and download speeds are higher than upload speeds. In contrast, leased lines are high-quality, dedicated, point-to-point data transmission services used by businesses, government and local authorities, financial and data centres etc. as well as telecoms providers. For example, mobile communication providers use leased lines to connect their radio base stations to their core network nodes.

4.10 As the technology supporting FTTP services develops, it will become increasingly possible to use FTTP to provide an alternative to leased lines at least for users that do not require very high bandwidth services or other features typically associated with leased lines, including resilience and security. Therefore, for a larger number of customers it will be increasingly difficult to distinguish between an ultrafast broadband connection and a leased line. More specifically, 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.[36] However, passive optical network equipment can be easily configured to provide services similar to point-to-point like services.

[34] These include Austria, France, Italy, Portugal, Spain, Switzerland. Germany has restricted its duct access remedy only to the segment of the access network which is located between the street cabinet and the MDF site. Thus, Germany has effectively designed its duct access remedy as an associated facility to sub-loop unbundling.
[35] https://www.ofcom.org.uk/__data/assets/pdf_file/0016/72025/international_case_studies.pdf
[36] Passive optical networks are fibre-based access networks with a point-to-multipoint architecture. 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 (typically between 1:8 and 1:128). Key elements of a PON are the optical line terminations (OLTs) - the central hub function located at the exchange; and optical network terminals (ONTs) – the customer-end equipment.

4.11 For example, Openreach is planning to launch a new FTTP product with guaranteed speeds of up to 1 Gbit/s specifically designed to offer businesses an alternative to leased lines.[37]

4.12 Stimulated by the availability of new fibre, consumers' demand for high-speed services is also likely to change. On the one hand, businesses which currently use low bandwidth symmetrical point-to-point leased lines (e.g. 10 or 100 Mbit/s Ethernet connections) and are less concerned about resilience and security may consider switching to a high bandwidth broadband service. Such broadband services are not prohibited by the current usage restrictions. On the other hand, as data demand grows, small businesses currently using broadband connections may consider switching to a point-to-point symmetrical link.[38]

4.13 When building their networks, we understand that telecoms providers would therefore want to retain flexibility to lay fibre in both point-to-point and point-to-multipoint architectures and use either technology, or switch from one to the other, to meet the specific needs of their customers. 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;
- 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.

4.14 Therefore, in summary, as technology and services evolve, we believe there are benefits to relaxing the current restrictions on the use of Openreach'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.

Economies of scope

4.15 We have looked at the extent to which usage restrictions may constrain the ability of potential investors to fully exploit the opportunities of deploying an efficient network.

4.16 One common characteristic of telecoms networks is that they typically exhibit considerable economies of scale and scope.[39] The ability to exploit such economies is important for telecoms providers looking to deploy networks in order to be competitive with other established end-to-end providers such as BT and Virgin

[37] http://www.btplc.com/news/index.htm#/pressreleases/openreach-makes-gigabit-speeds-available-across-the-uks-largest-wholesale-fttp-network-1638866
[38] For example, stakeholders have indicated that as small businesses are increasingly moving their data and applications to cloud-based systems and require high-speed, symmetric connections.
[39] As an end-to-end infrastructure provider, BT has the potential to operate a single network capable of delivering several different services, e.g. asymmetrical mass-market broadband services, mobile backhaul, local loop unbundling (LLU) backhaul (connectivity from Openreach's local exchanges to LLU providers such as Sky and TalkTalk), high quality point-to-point business connectivity services, etc. There are common costs that are recovered from the supply of these different services to BT's numerous wholesale and retail customers. These common costs arise from shared infrastructure in BT's core and backhaul network.

Media. In other words, alternative providers in general may have a reduced incentive to invest in a new fibre network if they are unable to use their new network asset to provide several different services to a significant number of customers.

4.17 Economies of scope, in particular, exist if there are cost savings from deploying and providing multiple services jointly on a single network as compared to deploying the same services on multiple 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. 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 running the infrastructure across a smaller customer base comprising only broadband customers.

4.18 A telecoms provider seeking to build its own fibre network would ideally combine different technologies and architectures to better serve the needs of different customers. As noted above, FTTP broadband networks serving residential homes and small businesses typically employ PON architectures (point-to-multipoint), whereas other customers require point-to-point leased lines.

4.19 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. In particular, shared routes generate savings, mostly in the passive elements of the network. These include:

- ducts and poles costs (PIA rentals or building costs) and other passive infrastructure costs (e.g. network buildings, cabinets, footway boxes, etc.);
- deployment / building and maintenance costs (e.g. ability to roll-out fibre at the same time, deployment of fibre in same sub-ducts, etc.);
- survey and design costs; and
- operational and business support systems (OSS / BSS).

4.20 In contrast, active elements, such as electronic equipment, are typically not common across services but rather represent a specific service incremental cost.

4.21 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.

- Telecoms providers have told us that this is an important aspect to take into account in their network planning. For example, based on its experience, one provider 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. Moreover, point-to-point leased lines are used for backhaul to mobile masts. These are typically located in urban 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.

- Another telecoms provider 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.

- We have carried out our own estimate of the overlap between non-residential premises (businesses and other organisations) and residential premises in each BT exchange area.[40] 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 demand.[41] On average, we estimate there is around one non-residential delivery point to every 20 residential delivery points and this ratio does not substantially vary across BT local exchange areas.[42] 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 similar to the average.[43] This suggests that there is likely to be geographic overlap between demand for leased lines and demand for ultrafast broadband.[44]

4.22 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, in 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 provider has argued that extending a residential deployment to cover business premises involves a relatively small investment, and in particular requires investments per premises which are below the average of a residential-only deployment. However, we note that even if the investment per premises is lower, there are still other barriers to providing service to business premises, such as securing wayleaves from landlords.

[40] This analysis is based on Ordinance 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.
[41] 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 just 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).
[42] In 63% of BT exchange areas the ratio of delivery points for business and organisations to residential is between 1:10 to 1:30.
[43] About 76% of the non-residential delivery points and 71% of the residential delivery points are located in exchanges where the ratio of non-residential to residential delivery points is between 1:10 and 1:30.
[44] A stable ratio of non-residential to residential delivery points across exchanges indicates geographic overlap, as exchanges 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 (and therefore, a ratio that is substantially different than the average).

- Conversely, the relatively low number of potential leased lines customers, in comparison to potential broadband 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.

Additional revenues from leased lines

4.23 A number of stakeholders have told us that the prospect of additional revenues from leased lines is critical for their investment decision of new fibre roll-out based on DPA.

4.24 We understand that offering multiple services would give investors greater pricing flexibility which would ultimately translate into better opportunities to attract customers and compete effectively. Telecoms providers would have the opportunity to discriminate prices and recover 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 providers recover their costs.[45]

4.25 We note, however, that in the absence of usage restrictions some telecoms providers could seek to use DPA to build a limited number of high value point-to-point leased lines connections only, without any immediate intention to build a scale broadband network.

Question 4.1: Do you agree with our assessment that broadening the uses of the PIA remedy could allow telecoms providers to design their networks flexibly, respond better to changes in consumer demand and provide innovative services?

Question 4.2: Do you agree with our definition of economies of scope? Do you agree with our overall assessment on the economies of scope and their likely sources?

Question 4.3: In relation to your fibre deployments plans, if any, can you provide us with any evidence regarding the economies of scope your company is likely to achieve if leased lines are allowed as part of a fibre-based broadband deployment?

Defining the scope of the new PIA remedy

4.26 We have considered the following issues in our initial assessment of how the current restrictions on the use of Openreach's infrastructure could be relaxed going forward.

- **Promoting competition and innovation**: does the option provide enough flexibility to promote innovation and competition? Does it encourage investment in new fibre networks by allowing providers to achieve economies of scope and compete for additional revenues?

- **Implementation, compliance and enforcement**: how difficult is it to implement the rule? Is there a risk of regulatory error? How difficult is compliance for BT and

[45] For example, according to its 2014/2015 Regulatory Financial Statements, BT recovers 15% of its total wholesale duct costs from regulated Alternative interface (AI) and Multiple Interface (MI) business connectivity services.

other providers? How challenging is it to enforce the rule? Does it provide enough clarity and certainty to ultrafast broadband investors?

- **The risk to BT's cost recovery**: Where a telecoms provider uses PIA to build point-to-point leased lines connections, it may impose greater competitive pressure on some of BT's business connectivity products. As a consequence, BT may see a reduction in the volumes of the active products it currently sells, which may affect its ability to recover its regulated costs. We therefore consider the extent of risk to BT's cost recovery.[46]

4.27 Consistent with our statutory duties, our strategic objective is to promote competition in broadband access networks to encourage fibre development direct to homes and businesses. The current PIA remedy is limited to the local access area,[47] and our initial view is 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).[48] We acknowledge it may be complex to assess compliance in certain circumstances, but we believe this approach should provide sufficient flexibility to make the PIA remedy effective.

4.28 We have considered these issues in relation to the following approaches to relaxing current usage restrictions:

- **Mixed usage in the local access area:** PIA can be used for leased lines in the local access area, provided this is part of a scale broadband deployment. We have considered two variants of a 'mixed usage' rule:
    - **specific rule**: one approach would be to specify what constitutes a scale broadband deployment and/or the extent to which providers can deploy leased lines in a specific area; and
    - **generic rule**: an alternative approach would be to set a generic rule that access must be part of a scale broadband deployment and assess on an individual basis whether the intended usage is primarily for ultrafast broadband deployment.
- **Any usage in the local access area**: no restrictions in the local access area, i.e. telecoms providers would be able to use PIA to provide any service in the local access area.

[46] The extent to which PIA could be used to replace leased lines would depend on a number of factors, such as the potential cost savings compared to using a leased line product (active or dark fibre), the costs of switching existing leased line services, and how far price controls reduce leased line prices now or in the future.
[47] By local access area, we mean the area covered by the Local Access Node, i.e. the area comprising all the Network Termination Points served by the same Local Access Node. Our current regulation defines the "Network Termination Point" as the physical point at which a relevant subscriber is provided with access. The "Local Access Node" is defined as a copper local exchange (Main Distribution Frame site), an optical local exchange (Optical Distribution Frame), a site to be designated as optical local exchange in the future, or a provider's building which is reasonably equivalent to a BT's optical local exchange in terms of distance and number of network termination points served.
[48] The local area is currently defined as the area covered by a single optical local exchange (BT has about 1,000 of these across the UK).

Mixed usage in the local access area

4.29 We have first considered a mixed usage rule that allows providers to install leased lines as part of a scale broadband deployment. Under this approach, providers would be able to use PIA for leased lines in the local access area but only when the services are provided over a shared network deployed for the purposes of delivering ultrafast broadband.

4.30 This would include connectivity to mobile radio base stations, but given the limitation to the local access area, it would not include the use of PIA to connect providers' network nodes for traffic aggregation across different local areas, e.g. for core and backhaul connections. A restriction to the local access area is consistent with the current regulation; BT's PIA reference offer excludes PIA usage outside local access for core and backhaul connectivity.[49]

4.31 Mixed usage would enable competitors to achieve economies of scope, set prices and recover costs form different services in a similar fashion to BT; the rule would still pose certain design constraints but we believe it could provide sufficient flexibility to enable providers to design their networks efficiently as they look to meet future demand.

4.32 Telecoms providers would not be able to solely deploy point-to-point, symmetric connections, preventing them from using the PIA remedy for leased lines use only. This would limit the risk that providers 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. Further, our analysis shows that a mixed usage rule should also have a limited impact on BT's cost recovery (see Annex 4 for more details). The business case for building a network using PIA offering high value business connectivity would only be evaluated in conjunction with a broadband deployment. We would expect any additional revenues from leased lines to improve the business case for offering broadband while reducing the risk of exhausting available duct capacity for purposes other than providing broadband connectivity.

4.33 In practice, when deciding whether to invest in a certain area, telecoms providers will take into account different factors such as their existing infrastructure, their existing and potential new customers and likely applications. This could lead to different telecoms providers seeking to deploy ultrafast broadband networks in very different ways. This adds complexity to how to measure a commercial network deployment against a mixed usage regulatory requirement, with implications for investment incentives. For example, a telecoms provider is likely to consider the commercial case for network deployment as a whole, including local access network assets as well as backhaul / core network assets; the boundary between the two may depend on the provider's choice of network architecture and design. Or, as a further example, it is unlikely that a telecoms provider will deploy a new broadband access network exclusively using Openreach's ducts and poles (given duct availability), instead self-building duct in some places as necessary; the resulting network would rely on a combination of self-built and Openreach ducts.

4.34 In order to be effective and provide sufficient clarity and certainty to both infrastructure providers and access seekers, it may be appropriate to set out some requirements that consider the following aspects.

[49] See footnote 32.

- First, the rule may need to set out the process of determining whether a deployment is primarily for leased lines, or whether it has been designed with a view to supporting mixed usage consistent with the strategic objective to promote competition in broadband access networks.[50]

- Second, limiting the assessment of mixed use to the local access area may, especially in network deployments combining both self-built and Openreach ducts, cause the telecoms provider to modify their network design due to regulation, rather than considerations based on their commercial and competitive strategies.

- Third, the rule must provide for a relatively simple way to check compliance, ensuring that both BT and its competitors are not required to undertake disproportionate assessments.[51]

4.35 We acknowledge that it is likely to be challenging to define a specific rule which addresses the above aspects. One potential option would be a rule that allows point-to-point deployments once the provider's fibre network passes a minimum number of homes and small businesses in a relatively large area (e.g. metro area or area served by an optical local exchange). For example, it would be possible to define a rule which allows providers to install one point-to-point leased line every 20 homes passed, in line with the average ratio of 1:20 discussed in 4.21. Similarly, a rule could be defined which allows providers the ability to deploy any number of leased lines after a certain proportion of homes have been passed in a given area. However, a rule of this nature could potentially limit the effectiveness of the PIA remedy by constraining telecoms providers' network design, placing them at a disadvantage to BT which is not subject to any such constraint.

4.36 An alternative option would be to define a more generic "mixed usage" rule. Under this approach, we would not attempt to specify or provide detailed guidance on the above aspects but rather reflect Ofcom's objective to promote investment in the large scale deployment of ultrafast broadband networks. For example, the rule could be set so that PIA can be used where the network deployment is predominantly for broadband to homes and businesses. Other services would also be allowed if part of a large fibre deployment serving homes and businesses in the area. Compliance with this option would need to be assessed by considering the telecoms provider, its target customer base and other factors such as its sales and marketing approach. Noting that there is likely to be only a limited number of telecoms providers interested in using PIA at scale, it may be possible to acquire information concerning their business model, and then examine compliance with a mixed use rule, relatively quickly. However, as with a mixed usage approach with a specific rule, this approach also has risks to be considered.

Risks and challenges with mixed usage

4.37 A mixed usage approach may present a number of implementation challenges.

[50] In practice, that may require identifying a metric (or metrics) to be able to evaluate a given network design/deployment. Examples of this metric could include the ratio of homes/small businesses passed or connected to large businesses passed or connected; duct length used or capacity dedicated to a leased lines connection vs a home connection.
[51] For example, it would not be desirable for access seekers to disclose their deployment plans to BT in order to show that their PIA deployment is compliant with the mixed usage rule.

- **Risk of regulatory error**: setting a very specific rule may have unintended consequences, e.g. the rule may not fit well with certain business plans given the complexity of how different variables interact. For example, how should a rule setting the permissible ratio of large businesses to homes passed be applied to a network deployment which uses Openreach's ducts in places but self-built ducts in others? In practice, it may be challenging to apply any such rule other than to the network as a whole, with the implication that self-built elements are also constrained. In addition, the rule may not be future-proof and constrain choice of network design. For example, there could be new applications such as deployment of mobile small cells or dense CCTV networks which may require a higher proportion of point-to-point fibre lines than those anticipated ex-ante by a specific ratio or threshold. A generic rule may help reduce this risk.

- **Compliance and enforcement**: checking and ensuring compliance for both access seekers and Openreach could raise challenges. For example, Openreach may need to reach a view on whether a specific fibre deployment is going to be used for ultrafast broadband and/or leased lines. In some cases a visual inspection of ducts, footway boxes etc. may be instructive, in other cases it may not be possible to confirm compliance until after the service is live, for example after the telecoms provider has configured and turned on its electronic equipment for its customers. This may require BT to have either visibility of rivals' business plans or of their actual passive and active deployments, which may raise concerns about the treatment of sensitive information. Lack of clarity or difficult processes for compliance may in turn discourage investments, especially if there is need to resort to dispute resolutions.

Any usage in the local access area

4.38 An alternative approach is to relax the current restrictions further and allow telecoms providers to use Openreach's infrastructure for any network architecture, including point-to-point and any type of service within the boundaries of the local access area. This means that providers would be able to use PIA for any purpose between the customer premises and a local access node. As for mixed usage, they would not be able to use Openreach's infrastructure to connect their network nodes for traffic aggregation across different local areas, e.g. for long-distance core and backhaul links.

4.39 Such a rule would be simpler to implement. It would provide greater market certainty to potential investors and reduce BT's ability to challenge rival's deployments. It would also deliver better equivalence with BT as competing telecoms providers would then have greater flexibility in deciding how best to use Openreach's infrastructure to deploy ultrafast broadband networks.

Risks and challenges with any usage

4.40 **Lower incentive to deploy ultrafast broadband**: the major risk with any usage is 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, for example in areas where there is a large concentration of premises seeking leased lines.

4.41 This could in turn have a number of implications.

- **Risk for BT's common cost recovery**: In Annex 4, we illustrate the possible cost recovery implications for BT of allowing any use of PIA in the local access

area. We have looked at the services which we think may come under greater competitive pressure as a result of relaxing usage restrictions, and the costs associated with these services based on 2014/15 RFS data. If we assume that a PIA based competitor won a third of BT's relevant set of leased lines connections, the cost at risk for BT could be up to £80m per year (although it would most likely be below such a figure). To place this in context, a cost recovery shortfall of around £80m a year, if recovered across all of Openreach's residential exchange lines, would imply an increase of £0.30 in monthly rentals.

- **Inefficient use of scarce resources**: the availability of duct and pole capacity to support competing ultrafast broadband networks, especially where it is already limited, may be at higher risk if providers use up the limited spare capacity for leased lines only.

Conclusions on options for PIA usage

4.42 We are conscious that the options presented above have both benefits and challenges. We have also considered ways to mitigate the potential risks.

4.43 We seek stakeholders' input on:

- whether there are other options we should consider in setting the scope of usage of the DPA remedy, or other important aspects that we should take into account; and

- an effective "mixed usage" rule. In particular, we would welcome views on our assessment above and a specific rule based approach (with explicit metrics) versus a generic approach establishing usage for predominantly ultrafast broadband.

Question 4.4: Do you agree with our assessment on the potential options to relax usage restrictions, their benefits, risks and challenges? Is there any additional option we should consider? What do you consider to be the best option?

Question 4.5: In your opinion, how can we design and enforce a mixed usage rule? What characteristics should it have and how can it be enforced? Do you think a mixed rule would materially constrain telecoms providers' network designs and business plans?

Question 4.6: In your opinion, how can we design and enforce an any usage rule? What characteristics should it have and how can it be enforced? Do you think an any usage rule, limited to the local area, would materially constrain telecoms providers' network designs and business plans?

Section 5

PIA process

Introduction

5.1 Stakeholders have argued that the current PIA product is not suitable for scale use, and that it is a more complicated and costly process for telecoms providers to deploy access networks using PIA than it is for BT using its internal processes.

5.2 In this section we provide our initial views on how the processes for PIA could be improved to better allow telecoms providers to access Openreach's duct and pole infrastructure to deploy their own networks at scale.

Openreach's plans to improve PIA

5.3 Following publication of the DCR, Openreach looked at ways of improving the current processes.[52] Through engagement with an industry working group, and five smaller telecoms providers, Openreach has initiated a Proof of Concept trial of various process changes that it anticipates could become business as usual from early 2017. The process changes include:

- allowing a telecoms provider to undertake a survey and deploy their network using Openreach's infrastructure in a single stage (as opposed to the current process which requires a survey to be completed by the telecoms provider, and subsequently approved by Openreach, in advance of any network deployment);
- 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 a telecoms provider to undertake its own duct clearance works (e.g. where ducts are blocked or collapsed) without Openreach's intervention; and
- allowing a telecoms provider to install a wider range of cable joints in Openreach manholes and joint boxes.

5.4 Alongside the Proof of Concept trial, by mid-2017 Openreach is intending to make available an online planning tool for telecoms providers that will provide the location of duct and pole infrastructure and an indication of available capacity. This represents a significant improvement to the current provision of network information, but its usefulness will be dependent on the technical specification of these changes.[53]

5.5 These developments are a significant step forward, however, as we discuss in more detail below, we consider that further changes could be required in view of the principles we have set out in Section 3.

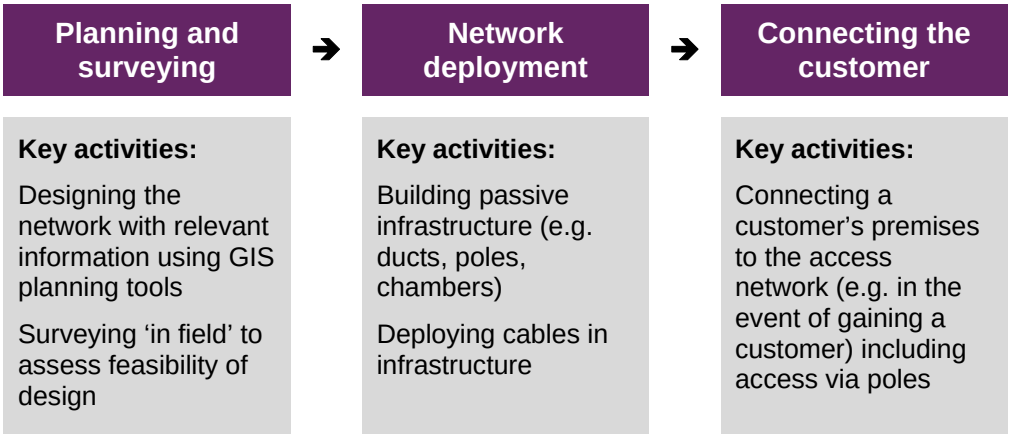
[52] http://www.btplc.com/News/#/pressreleases/openreach-trials-new-duct-and-pole-sharing-process-1467957

[53] For example, factors such as limits on the number of users that can access a system; limits on the volume of information that can be accessed by a user; and how often and how quickly information is updated in the system will impact its usefulness.

Overview of the PIA process

5.6 The activities required to deploy an access network can be broadly categorised into three main stages as illustrated in Figure 5.1.

Figure 5.1: Key stages of an access network deployment[54]



5.7 We use these three stages as a framework to examine the current PIA processes, and the potential issues associated with those processes; and to provide our initial views as to how these might be improved.

Planning and surveying

Overview of the planning and survey processes

5.8 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.

5.9 It is also typically necessary to undertake surveys, visually inspecting Openreach's infrastructure 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.

5.10 At the conclusion of the planning stage a telecoms provider will be in a position to enter into an agreement with Openreach to deploy its network using PIA and begin its field engineering activities. 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 re-works to its network deployment once in the field.

[54] Geographic information system (GIS) is a system that is designed to capture, store, manipulate, analyse, manage, and present spatial or geographical data. This is typically used as a tool by telecoms providers for planning their networks.

5.11 For the existing PIA product, the current operational processes for network planning and surveying may be briefly summarised as follows.

- Request prints: the telecoms provider requests 'prints' of Openreach's duct and pole records for the area in which it intends to deploy an access network.
- Initial planning: using the records supplied by Openreach, the telecoms provider makes a provisional access network plan.
- Field survey: after notifying Openreach, the telecoms provider undertakes a field survey to ascertain how much spare capacity is available in each infrastructure element (duct segment, joint box, man hole and pole) that it wishes to use.[55]
- Refine plans: the telecoms provider refines its network plan in light of the field survey results.
- Reservation request and approval: the telecoms provider submits a reservation request together with its field survey results. This lists all the infrastructure elements that the telecoms provider wishes to use (e.g. duct segments and joint boxes) and if required, a request for Openreach to install additional capacity. Openreach reviews and approves the request.

The current processes are not suitable for use at scale

5.12 Our analysis and engagement with telecoms providers indicate that the format and content of the network records that Openreach makes available, together with the survey requirements set by Openreach, make PIA unsuitable for use at scale. In particular:

- Format of network records: records are supplied to telecoms providers in a format that is not suitable for large scale planning work. Records are supplied as JPEG images (screen prints from Openreach's records system) rather than a GIS format that could be imported into telecoms providers' planning tools. As a result, network record information has to be manually extracted or transposed at each of the process steps discussed above.
- Capacity information: 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. As a result, telecoms providers have to incur considerable expense undertaking field surveys to determine how much spare capacity is available in each joint box, manhole and pole that they may wish to use. Moreover, field surveys cannot provide visibility of capacity that has been reserved, but not yet used. Consequently, there is a risk that telecoms providers' plans will be rejected, or require modification, at the reservation request stage because there is less spare capacity than field surveys would suggest.

5.13 In addition, the operational process timescales are lengthy reflecting their manual nature and the multiple interactions between telecoms providers and Openreach. Openreach's lead time for the provision of network records and approval of telecoms providers' plans are 20 working days for a single local exchange area. Furthermore,

[55] For each joint box, manhole and pole that they wish to use, telecoms providers are required to compile a detailed record comprising photographs and a list describing the location and size of each cable.

we have made site visits to observe telecoms providers carrying out field surveys and recording the information required by Openreach for PIA. This evidence indicates that these activities might take many weeks for a single local exchange area.

Openreach does not face these barriers when deploying its own network

5.14 Openreach's own network planning activities do not face comparable barriers to those faced by telecoms providers using PIA, and are consequently much better suited to scale usage. In particular:

- Openreach planners have online access to infrastructure records in a network planning tool and do not therefore incur delays waiting for infrastructure records to be provided.

- Openreach's network planning tool holds capacity information (including details of reservations), enabling Openreach to produce network plans without recourse to field surveys to assess spare capacity.

- Field surveys carried out by Openreach are limited to verifying and refining plans. Surveyors report only record inaccuracies, safety hazards and proposed refinements to network planners. Unlike PIA there is no requirement to compile detailed records of cables in each network element used.[56]

- Openreach planners self-certify their plans and do not therefore incur delays waiting for their plans to be approved, as is the case for telecoms providers using PIA.

Question 5.1: Have we correctly identified the problems currently faced by telecoms providers using PIA in relation to planning and surveys?

Changes to improve the planning and surveying processes

5.15 We consider that changes are required to the planning and survey processes to make PIA suitable for scale use and to ensure that competing telecoms providers can plan access network deployments in an equivalent or comparable manner to BT.

5.16 To deliver these improvements we consider that changes are required to the format and content of the network records such that telecoms providers have access to the same information that Openreach makes available to its own planners. In particular:

i) Network records: network records should be provided to telecoms providers in a digital format that is suitable for importing into telecoms providers' GIS network planning tools.

ii) Capacity information: Openreach should make the capacity calculations that it holds available to telecoms providers in a suitable format. This should take account of capacity that has been reserved but not yet used.

iii) Granularity of information: the network records should be sufficiently granular for telecoms providers to plan access networks without undertaking field surveys as a precursor. It should therefore include location information for ducts, joint boxes,

[56] For example, PIA users are required to record the diameter of each cable in every duct leaving every joint box and manhole that they wish to use.

manholes and poles, and associated attribute information such as element identifiers, pole sizes, number of duct bores and joint box / manhole sizes.

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.

v) Planning area highlights: Openreach currently has a facility in its planning system to highlight areas where planning activity is in progress to avoid two planners preparing plans to use the same network elements. We think this information should be made available, suitably anonymised, to other telecoms providers.[57]

5.17 These improvements would allow the operational processes to be better aligned with those used by Openreach. In particular:

i) Field surveys prior to planning activity: the provision of capacity information may obviate the need for field surveys as a precursor to planning activity.[58] The requirement for telecoms providers to undertake field surveys and to submit survey results to Openreach should therefore be withdrawn.

ii) Field surveys post planning: requirements for field surveys post planning should be better aligned with Openreach's operational processes and therefore be limited to verifying the validity of the telecoms provider's plan, 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.

iii) Reservation information: After plans are finalised, telecoms providers submit a reservation request listing all of the infrastructure elements they wish to use (e.g. duct segments and joint boxes) and elements that may need augmentation to provide additional capacity. Currently telecoms providers have to manually record this information in a spreadsheet supplied by Openreach. To make this process less labour intensive, 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, as at present.

Question 5.2: Do you agree with our initial views around how the planning and survey systems and operational processes should be improved under PIA?

Development of technical requirements for planning process interfaces

5.18 As most of the improvements identified above relate to the exchange of infrastructure records between Openreach and telecoms providers, it will be necessary to develop electronic interfaces to support the flow of information in a structured manner.

5.19 Given the technical nature of these interfaces, we have commissioned consultants Mott MacDonald to produce a detailed set of technical user requirements to inform our consideration of the changes that may be required. We intend to publish Mott MacDonald's report at a later date.

[57] Planning area highlights should be suitably anonymised inside Openreach itself. This will require a form of 'Chinese walls' to be established.
[58] We note that the capacity information available may not be complete or correct and telecoms providers may still prefer to conduct field surveys in order to confirm available capacity.

Recovery of systems development costs

5.20 We have considered how Openreach should recover the costs incurred in developing systems which meet these requirements, as well as associated ongoing operating costs. Applying the principle of equivalence set out in Section 3, our initial view is that Openreach should recover these costs in the same way it recovers the costs of its own internal infrastructure records systems i.e. across all users of its physical infrastructure including BT itself. This approach of pooling and spreading these costs would eliminate any differential between the costs faced by BT and other telecoms providers and thereby ensure a level playing field.

5.21 The alternative of recovering these costs from external PIA users alone would be much more dependent on assumptions about PIA take-up, which is uncertain and therefore highly likely to result in over-recovery or under-recovery of these costs. Moreover, we consider that our proposed approach has a number of other benefits compared to recovering these costs from external PIA users alone: it could provide Openreach with a stronger incentive to undertake the systems development in an efficient manner; it reflects the fact that the systems improvements are intended to encourage greater network competition which benefits a wider group of consumers; and it reflects our expectation that Openreach itself will use the systems in future.

Question 5.3: Do you agree with our initial views around how systems development costs should be recovered?

Network deployment

Overview of the network deployment processes

5.22 The current operational processes for the network deployment stage may be briefly described as follows:

- Build works: Openreach instructs its contractors to install new capacity as requested by the telecoms provider in its reservation request.
- Network deployment: after it receives notification from Openreach that build works have been completed, the telecoms provider proceeds with the installation of its access network.
- Enabling works: when blocked ducts are encountered during network deployment, the telecoms provider requests Openreach to carry out enabling works to clear the blockages.[59]
- Completion notification: once it has completed its access network deployment, the telecoms provider notifies Openreach and provides details of any deviations from its original plan (as set out in the reservation request) so that Openreach may amend its records.

Problems at the network deployment stage for telecoms providers using PIA

5.23 The current PIA remedy requires Openreach to set out arrangements for relieving congested physical infrastructure, including the repair of existing faulty infrastructure

[59] In the Proof of Concept trial, telecoms providers are permitted to clear blockages themselves after first notifying Openreach.

and the construction of new physical infrastructure. We consider that there are a number of issues with the existing arrangements set out in Openreach's reference offer that could act as an impediment for a telecoms provider looking to use PIA on a large scale.

- Build works: under the current processes, Openreach undertakes all build works required by telecoms providers. Openreach does not currently offer service level agreements (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.

- Enabling works: under the current processes, Openreach undertakes all enabling works to repair collapsed and blocked ducts.[60] As for build works, Openreach does not currently offer service level agreements for these activities and therefore has little incentive to complete these activities in a reasonable time, causing telecoms providers uncertainty and potentially delays. This is particularly problematic as the need for the enabling works is typically encountered during network deployment when ducts are rodded immediately prior to sub-duct or cable deployment.[61] In addition to delaying completion of network deployment, enabling work delays may also result in additional costs if cabling teams are forced to wait for enabling works or to return to site at a later date.

- Charges for build and enabling works: telecoms providers pay the full upfront cost of any build and enabling works they request. Moreover, as infrastructure has to be built in standard increments, such as an additional duct bore or joint box, 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. In contrast, when Openreach incurs build and enabling costs to support BT's own network deployment and capitalises these costs, they are recovered across all users of its physical infrastructure via depreciation charges from all products according to their overall average usage. Other telecoms providers using Openreach's physical infrastructure therefore face different upfront costs to those faced by BT, adding to the risk of their business case and putting them at a disadvantage to BT. This acts as a barrier to competitive network investment.

Question 5.4: Have we correctly identified the problems currently faced by telecoms providers using PIA in relation to the network deployment stage?

Changes to improve the network deployment stage for PIA users

Arrangements for relieving congested physical infrastructure

5.24 We consider that the PIA access remedy should include a requirement on BT to make adjustments to its network to relieve congested physical infrastructure, since this is important for the PIA remedy to be effective.[62] This can either be by repairing

[60] Ibid 59
[61] Rodding is the act of inserting a set of flexible rods in a duct, either to clear a blockage, or to insert a rope that can subsequently be used to pull a cable or sub duct through the duct.
[62] The concept of network access under Article 12 of the Access Directive includes making adjustments in order to make available to another undertaking facilities and/or services for the purpose of providing electronic communications services.

existing faulty infrastructure through enabling works, or constructing new physical infrastructure where there is insufficient capacity through build works.

5.25 In the absence of such a requirement, a lack of capacity or a blockage in a relatively small part of Openreach's infrastructure could prevent telecoms providers from gaining the benefits from duct access across a much wider part of Openreach's infrastructure. Although a telecoms provider may be able to build its own infrastructure to bypass the section of duct where capacity is not available, the inefficiency introduced in integrating ad hoc parts of a telecoms provider's own infrastructure with Openreach's infrastructure may render the deployment unviable, and therefore the PIA remedy ineffective.

5.26 Notwithstanding the above, the requirement on Openreach to make adjustments to its network under PIA is limited to making available to another undertaking facilities and/or services for the purpose of providing electronic communications services. Our initial view is that incremental augmentations to Openreach's existing infrastructure are likely to be necessary since these incremental augmentations are needed to allow telecoms providers to access the existing BT network. On the other hand, requests by telecoms providers for extensive, continuous lengths of infrastructure to be provided by Openreach are less likely to be necessary where these appear to be about extending the network rather than making use of existing network assets. However, we would like views from stakeholders about this and how limits could be defined.

Question 5.5: Do you agree that the PIA remedy will be ineffective if Openreach is not required to make adjustments to its infrastructure?

Question 5.6: If so, do you have any views on how the limit on Openreach's requirement to make adjustments should be specified?

5.27 We set out below how we think the arrangements for build and enabling works should change, to ensure that the PIA remedy is effective through enabling telecoms providers to deploy access networks in an equivalent or at least comparable manner to BT, as well as to provide greater certainty about timings and costs.

5.28 A telecoms provider is likely to identify whether build works are required during the planning and survey stage and prior to its reservation request. Whereas, the need for enabling works is likely to be identified once the telecoms provider has started to deploy its network. We consider that different process arrangements for build and enabling works may be needed to reflect this and the specific characteristics of each type of works.

5.29 We first set out our proposals for how Openreach should recover the costs of build and enabling works as this has an important bearing on our proposals for how the process should work. In particular, we recognise that Openreach needs to retain an appropriate degree of control where it bears the costs of particular works.

Charges for build and enabling works

5.30 Our initial view is that there should be changes to the way Openreach charges for build and enabling works so that Openreach recovers costs in the same way whether it upgrades its infrastructure to accommodate BT's network or a competing network.

5.31 In practice, this would mean Openreach would recover costs of build and enabling works over all products that use Openreach's physical infrastructure. It would not use

ancillary charges to pass on the upfront costs of build and enabling works to the telecoms provider that requests them.

5.32 Our proposal would ensure that telecoms providers are not at a disadvantage compared to BT in respect of the upfront costs of build and enabling works. The proposal would reduce both the level and unpredictability of costs faced by telecoms providers when deploying a fibre network.

5.33 By not passing the full upfront cost of the works onto the telecoms provider which requests the works, we also reflect the fact that the infrastructure remains Openreach's asset, used to generate rental charges.[63] Moreover, build and enabling works improve the infrastructure that is shared across multiple services, and support further network competition that will benefit a wide group of consumers.

5.34 When considering processes for connecting the customer, later in this section, we observe that there may be merit in pursuing a different regulatory approach to pole access, given the different issues that arise. In principle, our initial views relating to cost recovery of build works and enabling works could potentially also apply to pole infrastructure.

Process for build works

5.35 For PIA to be used at scale, we consider it essential that telecoms providers have greater certainty about the delivery time for build works. This could be achieved by:

- providing greater certainty about the delivery time for build works by Openreach: for example, by the introduction of service level agreements and guarantees (SLAs and SLGs); or
- adopting a self-provision approach: allowing telecoms providers to undertake build works themselves.

Providing greater certainty for build works undertaken by Openreach

5.36 Under the current PIA processes, Openreach undertakes all build works required by telecoms providers using PIA.

5.37 Introducing a set of SLAs and SLGs could give telecoms providers: better visibility of the timescales for build works; greater certainty about their completion; and compensation when SLAs are breached. SLGs could also provide Openreach with a stronger incentive to ensure that works are executed in a timely manner. It is, however, unclear whether SLGs could fully align Openreach's incentives with telecoms providers' requirements.

Providing greater certainty for build works using a self-provision model

5.38 As part of its Proof of Concept trial Openreach is currently testing a self-provision approach for enabling works (e.g. clearance of blocked ducts) under which telecoms providers undertake enabling works themselves after obtaining authorisation from Openreach. Subject to the outcome of this trial, self-provision could be extended to build works.

[63] Currently, telecoms providers pay standard rental charges for the newly built or repaired infrastructure elements in addition to the full cost of any build and enabling works they request.

5.39 We recognise that if self-provision was extended to build works, Openreach would need to retain control over certain elements of the work including:

- Design aspects: Openreach should be able to ensure that any build works are in accordance with its engineering design rules for its network.
- Quality: Openreach should be able to ensure that build works are completed to an adequate standard.
- Approval: Openreach should be able to review requests to determine whether they are within the scope of the network access remedy as discussed in paragraphs 5.24 to 5.26 above.
- 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 telecoms providers, Openreach should not face higher costs than if it did the work itself.
- Method by which incremental capacity is provided: Openreach should be able to specify how additional capacity is provided so that it can ensure that it is provided in the most efficient manner. For example, Openreach could choose to recover redundant cables to free up duct capacity rather than install new ducts, or it might take the opportunity to build additional capacity for other purposes at the same time.

5.40 We understand that Openreach sub-contracts most build works to civil engineering contractors, so a self-provision model could be similar to these current arrangements, with Openreach allowing telecoms providers to undertake build works where this is done on similar terms (including prices) to the terms on which Openreach engages its own civil engineering contractors.

5.41 Self-provision may have several advantages over provision by Openreach.

- It would further our aim of achieving equivalence by granting telecoms providers a comparable level of control over the execution of build works to the control Openreach already has over its own network deployment activities.
- Telecoms providers would be less reliant on Openreach for build works. Once authorisation has been obtained, telecoms providers would have direct control over the execution of build works. They might therefore be able to improve coordination of the works with their network deployment activities and as a result reduce lead times and costs.
- Self-provision would have a lower burden on Openreach since Openreach would not be responsible for delivery of build works within SLAs.

5.42 Our initial view is that self-provision could be a better option than improving certainty for build works undertaken by Openreach, especially if the advantages discussed above (particularly in relation to coordination of build and network deployment activities) are sufficiently large to justify telecoms providers taking on build works.

5.43 For a self-provision model to operate satisfactorily, it would be necessary to provide telecoms providers with greater certainty about the processing of authorisation requests by Openreach. Our initial view is that SLAs and SLGs limited to the authorisation process would provide telecoms providers with the necessary assurance.

5.44 As part of this consultation we would like to gather stakeholder views on whether alternative approaches to SLAs and SLGs could be adopted to authorise build requests under a self-provision model that would provide better certainty to telecoms providers.

Question 5.7: How should certainty about delivery of build works be improved?

Question 5.8: Could a self-provision model work in practice? Are the benefits of self-provision sufficiently large to warrant adopting this approach or would it be better to improve the delivery of build works by Openreach through, for example, introducing a set of SLAs and SLGs?

Question 5.9: Would there be merit in adopting both approaches (i.e. Openreach required build and self-provision), perhaps allowing self-provision for specific types of build works where close coordination is required?

Process for enabling works

5.45 A telecoms provider installing its network using Openreach's infrastructure may find instances where there are collapsed or blocked ducts that prevent it from deploying its network. In these circumstances, enabling works on the duct infrastructure will be required to allow the telecoms provider to progress its network deployment.

5.46 We consider that the requirements and characteristics relating to enabling works may differ to build works in the following ways:

- the need for enabling works are likely to be identified during the deployment of the telecoms providers network (as opposed to during the planning and survey stage for build works);
- enabling works are likely to be of a smaller scale and less complex than build works; and
- it is likely to be necessary to complete enabling works promptly to avoid delaying network deployment activities.

5.47 Our initial view is that telecoms providers should have the opportunity to complete the necessary enabling works themselves (i.e. without requiring Openreach to intervene to make the necessary repairs), for the following reasons.

- The telecoms provider will have civil engineering contractors on site and therefore could be in a position to complete the enabling works at the same time as its network deployment. As such, this would represent a more efficient process than having to stop work and seek Openreach's intervention.
- Given the telecoms provider has a committed workforce on site it is imperative that it is able to utilise this effectively to deploy its network efficiently and with certainty.

5.48 Notwithstanding the above, we also consider that BT should recover the costs from repairs and maintenance relating to providing PIA on an equivalent basis to the repairs and maintenance of its infrastructure for its own use. Accordingly, we envisage that the telecoms provider could recharge Openreach for enabling works. However, where enabling works are required that impact Openreach's own cost base

Openreach will need to have a role in the process as part of authorising and controlling the incidence of such works.

5.49 Our initial view is that where a telecoms provider deploying its network finds a blocked or collapsed duct, the process for completing the respective enabling works could allow the following choices:

i) The telecoms provider is able to complete the enabling works (at its own expense) immediately and without any intervention from Openreach; or

ii) The telecoms provider is able to 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.[64] After obtaining approval, or if BT fails to provide a response to the authorisation request within the SLA, the telecoms provider would complete the work and charge Openreach for that work based on an agreed price list; or

iii) The telecoms provider is able to 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.

5.50 While the above would represent a significant change to the existing PIA process, we note that Openreach has acknowledged the prospect of allowing accredited telecoms providers the ability to carry-out their own enabling works (without Openreach intervention) in the future and is currently running a trial that allows this.

5.51 In addition, a process whereby telecoms providers seek approval from Openreach in advance of undertaking enabling works would be comparable to the process that Openreach follows itself with third-parties (i.e. sub-contractors) when it is deploying network on behalf of BT.

Question 5.10: Do you agree with our initial views relating to improving the process for enabling works by allowing telecoms providers greater opportunity to carry out these activities?

Question 5.11: What, if any, SLAs and SLGs should apply to the process for enabling works?

Relaxation of the cable joints restrictions

5.52 Telecoms providers have asked Openreach to make changes to the technical specifications of the PIA product to allow them to install a wider range of cable joints in Openreach manholes and joint boxes. Currently, only in-line joints are permitted so that telecoms providers must install additional joint boxes, next to Openreach's, in order to house other types of joints such as distribution joints (a one-to-many cable joint as typically required at a branch in an access network). Openreach is currently trialling more flexible arrangements as part of its Proof of Concept trial.

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

5.53 The cable joint restrictions are not in accordance with our objective of allowing telecoms providers to deploy access networks in an efficient manner and on an equivalent basis to BT.

5.54 Access networks necessarily employ one-to-many joints at branching points and distribution points and we therefore regard the ability to deploy such joints in Openreach's joint boxes and manholes as an essential element of an effective duct access product. We consider that Openreach should amend the PIA product specification so that the same rules apply to telecoms providers as apply to BT.

Question 5.12: Do you agree with our initial views relating to the relaxation of cable joints restrictions? Are there other technical specifications that we should consider to ensure telecoms providers are able to deploy access networks in an efficient manner and on an equivalent basis to BT?

Connecting the customer

Overview of connecting the customer stage

5.55 The final connection between a customer's premises and the access network deployed by the telecoms provider is known as the 'lead-in'.

5.56 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. A particular 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.

5.57 This part of the network has unique characteristics as infrastructure is, in general, associated solely with a single premises. Moreover, the existing lead-in infrastructure is often designed and configured for the provision of minimal cable installations,[65] which presents potential capacity constraints, that could hinder competitive network deployment.

5.58 The specific constraints that exist for overhead and underground lead-ins mean that it may be appropriate to consider different regulatory approaches for each.

Overview of connecting the customer via overhead lead-ins

5.59 The PIA remedy was introduced to allow telecoms providers to take advantage of existing Openreach infrastructure assets, including poles, to deploy independent networks to customers. However, telecoms providers have told us that their ability to use Openreach's poles to deploy lead-ins may be limited by capacity constraints.

5.60 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.[66] Telecoms providers who have conducted field surveys for PIA have found that a significant proportion of Openreach's poles, in the urban and

[65] For example, underground lead-ins often use smaller diameter ducts than street ducts.
[66] Other factors that may limit the capacity of a distribution pole including dropwire length, the presence of aerial cables and stays.

suburban areas surveyed, have insufficient capacity to support a second telecoms provider's dropwires to all the premises they might seek to connect.[67]

5.61 In the event that a pole has reached its capacity the 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.

5.62 Under the current PIA terms, Openreach will charge the full up-front cost of any build works requested by the telecoms provider. We consider that this presents a significant impediment to a telecoms provider using PIA in areas where lead-ins are provided via overhead dropwires.

5.63 Even where there is capacity for additional dropwires on the pole, it may not be easy for the telecoms provider to use this capacity. This is because the additional dropwire needs to be physically separate (and therefore connected at a different point on the home) to prevent it rubbing against the original dropwire and consumers may be unhappy with the visual impact of multiple wires attached to their homes.

Openreach does not face these barriers when deploying its own network

5.64 If Openreach wants to connect a home with fibre, it can simply replace the existing copper dropwire with a fibre dropwire (or a hybrid fibre/copper dropwire if it wished to maintain the copper connection). This would involve minimal cost and much lower risk than the options available to other telecoms providers, giving BT a significant advantage in deploying fibre to the home.

Question 5.13: Have we correctly identified that replacing dropwires would be a simple and low cost option where poles are capacity constrained?

Changes to improve the connecting the customer stage via overhead lead-ins

5.65 Our proposed approach to cost recovery for build works, as outlined above, could help remove this impediment to telecoms providers using PIA where lead-ins are provided via overhead dropwires. This is because under this approach a telecoms provider's upfront costs would be more comparable to those faced by BT's access network deployment.

5.66 However, even taking account of this approach to cost recovery (and the options we outline around the process for undertaking build work) our initial view is that there are other issues relating to carrying out work on poles that may present a material barrier to effective use of poles for overhead lead-ins. In particular, where additional capacity is required on a pole:

[67] A telecoms provider would typically require sufficient capacity for its forecast requirements over an extended period, thus poles would need to have capacity to support a significant volume of additional dropwires.

- 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.[68]

- Some solutions, such as the provision of additional poles may be unpopular with local residents.

5.67 Under the current process, consumers already have the right to ask Openreach to remove the existing copper dropwire from their home. We have considered whether barriers to the use of poles for overhead lead-ins could be overcome by Openreach responding to such requests when a consumer wants 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.

- Openreach and the competing telecoms provider would need to co-ordinate their activities in the removal of the existing dropwire, the provision of the new dropwire and the additional work in installing optical fibre into the premises. If these activities do not occur at the same time, then the customer will be without a fixed broadband or phone service until all activities have been completed.

- Switching in the future is likely to be more difficult and costly. If, at a later date, the consumer wishes to switch to a broadband service provided using copper rather than fibre-based infrastructure (e.g. switch back to a FTTC product), then the process may need to be reversed, again with the potential of loss of service.

5.68 Therefore, our initial view is that were we to rely on the possible approaches under the current PIA remedy consumers could be reluctant to switch to fibre, and in turn telecoms providers may be more reluctant to deploy fibre access networks in areas with overhead lead-ins.

5.69 Furthermore, it is unclear to what extent Openreach holds records of the condition or capacity of individual poles which could result in a telecoms provider facing uncertainty as to the timescales and costs involved in customer connection and service provision. While it is possible that a pole will be able to accommodate the provision of an additional dropwire, it could not be guaranteed. For a telecoms provider wishing to deploy a network at scale with the intention of acquiring significant customer volumes over time, such uncertainties could play a material role in whether a telecoms provider chooses to plan deployment in areas with significant overhead lead-ins.

Question 5.14: Have we correctly identified the particular problems for telecoms providers using PIA where there are overhead lead-ins?

Question 5.15: Under our proposed approach to cost recovery for build works are there remaining issues for telecoms providers using Openreach's poles for overhead lead-ins that represent barriers to the use of PIA?

[68] Some poles carry aerial cables en-route to other distribution points in the area, not just those cables for customer lead-ins.

5.70 In view of these issues, we have considered whether an alternative approach where telecoms providers are able to access Openreach dropwires may have merit in providing an effective remedy to overhead lead-ins and addressing the competitive imbalance that currently exists.[69]

5.71 Our initial view is that under such an approach, Openreach would be responsible for upgrading an existing copper-only dropwire for a hybrid fibre/copper dropwire on the request of a telecoms provider (when they are seeking to connect a customer). As part of the activity of upgrading the copper dropwire, Openreach would reconnect the copper connection thereby ensuring continuity of service while leaving the fibre connection available for the telecoms provider to connect to the premises and the pole (and complete the end-to-end customer connection, including in-home installation).[70] This requirement would be implemented by imposing a new form of network access which would comprise both the dropwire upgrade by BT and the subsequent rental of that upgraded dropwire by the telecoms provider.

5.72 Openreach would retain ownership of the hybrid dropwire and charge rental to the telecoms provider for its use.

5.73 Our initial view is that this approach could have merit for the following reasons:

- it would unlock scarce capacity and make full use of existing poles;
- it would be cheaper than augmenting or overbuilding network infrastructure in the area (e.g. adding additional poles);
- it would reduce the need for multiple engineer visits and work on the pole;
- it would allow continuity of service to be maintained prior to the telecoms provider connecting the fibre;
- it would allow for easier customer switching in the future; and
- it would further our objective of ensuring equivalence between BT and other telecoms providers in the use of Openreach's poles.

5.74 We recognise that this approach would raise a number of complexities that will need to be resolved if taken forwards. For example, Openreach would be required to develop a set of processes (and a technical solution) to allow it to respond to a telecoms provider's request for a dropwire upgrade.

5.75 While we have not considered in depth the various technical approaches that could be adopted, we consider that the provision of hybrid dropwire cables would facilitate future switching between the telecoms provider's fibre service and Openreach delivered services supported by FTTC or G.fast technologies.[71] However, any

[69] We note that an industry working group has also discussed whether such an approach could be viable.
[70] Our initial view is that where enabling work is required to a pole, for example for repair (which may in practice mean that a pole needs to be replaced) or maintenance, Openreach should have responsibility for undertaking this work and those costs when capitalised should be recovered across all users of the network.
[71] The strengthening and protection elements of a dropwire constitute much of the weight of a dropwire rather than the fibres or copper wires therein.

approach would also need to consider an appropriate way for a telecoms provider to interconnect to its own fibre network infrastructure with the dropwire. For example, one approach could involve Openreach allowing telecoms providers to place fibre distribution points (boxes) on Openreach's poles with the use of standardised fibre connectors.

5.76 We also acknowledge that SLAs and SLGs may be needed to ensure that Openreach responds in an appropriate way to a request from a telecoms provider. In addition, in providing a dropwire upgrade, Openreach will incur costs and these would need to be recovered. However, we have not considered these issues in further detail at this stage.

5.77 In this consultation, we are particularly interested in hearing views on whether we have correctly identified the specific challenges that are faced by telecoms providers looking to connect customers using Openreach's poles; and whether a dropwire upgrade solution could provide an effective and proportionate approach to addressing those challenges. In the event that feedback and evidence from this consultation indicates that the proposals set out here would be effective and viable, we would examine implementation details and cost recovery in our subsequent WLA market review consultation.

5.78 The dropwire upgrade approach could be required only in cases where poles are identified as being capacity constrained, or it could be required in all cases. Adopting this approach for all poles irrespective of loading could offer telecoms providers greater certainty about how a pole can be accessed. It would also avoid a change in process being required at some point in the future, recognising that all poles may eventually become capacity constrained.

5.79 We are aware our proposals need to be the minimum necessary to achieve our objectives and therefore welcome evidence that will inform our analysis and consideration.

Question 5.16: Do you agree with our initial view that a dropwire upgrade approach could provide an effective and viable remedy for overhead lead-ins?

Question 5.17: If we were to take forward a dropwire upgrade approach for overhead lead-ins what are the specific issues that we would need to address in developing the PIA remedy?

Question 5.18: If we were to take forward a dropwire upgrade approach should this apply to all overhead lead-ins or only where a pole is capacity constrained?

Our initial views concerning the arrangements for duct lead-ins to the home

5.80 Our initial view is that underground lead-ins should be distinguished from overhead lead-ins because of their different characteristics and the different constraints that apply.

5.81 We consider that a telecoms provider intending to connect a customer via an underground lead-in using Openreach'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.

Duct with sufficient capacity for additional fibre

5.82 Where duct is available and has sufficient capacity to deploy additional or new fibre, our view is that Openreach should offer access to this infrastructure. This is consistent with how PIA works currently.

5.83 In contrast with our initial views relating to overhead lead-ins, we do not propose an approach whereby Openreach is required to upgrade existing copper lead-ins for hybrid lead-ins since our view is that the barriers that exist for overhead lead-ins do not exist to the same extent.

5.84 Where a telecoms provider discovers such duct is blocked or collapsed, our initial view is that the process for completing the respective enabling works (and approach to cost recovery) should follow that outlined earlier in this section for enabling works in other parts of the duct infrastructure. This will ensure telecoms providers are able to deploy access networks in an efficient manner and on an equivalent basis to BT.

5.85 We note however, that in relation to duct lead-ins, a telecoms provider may be more likely to complete the enabling works itself, without pausing its field work to notify and request approval from Openreach. This is because a telecoms provider is more likely to be responding to a specific customer order and therefore will want to connect that customer with as few delays as possible whilst it has an engineer at the customer premises completing that connection. Furthermore, the extent of the enabling work may be relatively limited given the shorter length of duct lead-ins compared to duct lengths in other parts of the local access area. Where a telecoms provider undertakes the enabling works immediately and without seeking approval from Openreach, as before, we would anticipate this being at the telecoms provider's own expense.

Duct without sufficient capacity for additional fibre or where no duct exists (i.e. directly buried lead-in)

5.86 Where there is no duct available or the duct is too small to accommodate an additional cable, our initial view is that the telecoms provider should deploy the infrastructure for its lead-in at its own cost and risk. Accordingly, new underground duct built by the telecoms provider would remain their own property.

5.87 We recognise that this is different to our proposed approach to capacity issues in respect of other duct in the access network (as set out earlier in this section). However, we consider that where a telecoms provider is intending to connect a customer this is likely to be as a result of a confirmed customer order and where duct is needed in relatively short lengths. It is likely that the risks of not being able to recover costs will be more limited in these situations.

Question 5.19: Do you agree with our initial views for how duct lead-ins should be treated under PIA?

Section 6

Pricing of PIA

Background to PIA pricing

6.1 In the DCR, we expressed the view that the pricing of PIA is broadly in line with international comparisons, and noted that this view was supported by stakeholder submissions. However, we committed to review pricing as required to ensure the PIA remedy can be effective.

6.2 Under the current PIA remedy, prices for PIA products are required to be cost oriented but are not subject to an explicit charge control.

6.3 We consider that some form of price regulation is likely to be appropriate to support an obligation to provide PIA. Price regulation guards against the risk that Openreach would set excessively high prices in order to maximise profit and increase the costs of telecoms providers using its infrastructure. Such 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/or result in higher retail prices which would be detrimental to consumers.

6.4 In this section, we set out our initial views on the appropriate approach to regulating PIA prices going forward. Openreach sets prices for a number of different infrastructure elements and ancillary charges that comprise the PIA product. We first discuss rental prices for infrastructure sharing (e.g. duct, pole, joint box and manhole sharing), and in particular, whether we should place stricter controls on these prices. We then discuss the prices charged for supplementary services or activities (which we refer to as “ancillary charges”).

PIA rental prices

6.5 All PIA prices are currently 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. However, the basis of charges condition does not specify how precisely prices should be calculated.

6.6 Following imposition of the PIA remedy in the 2010 WLA Statement, Openreach produced an initial set of prices in early 2011 and then, after a process of review, put in place a set of lower prices in October 2011. In 2013, Openreach further reduced some PIA prices following the outcome of the appeal of the 2012 Regulatory Asset Value (‘RAV’) adjustment.[72]

[72] 2014 FAMR Statement, paragraphs 12.384-12.385.
https://www.ofcom.org.uk/__data/assets/pdf_file/0032/78863/volume1.pdf

6.7 Annex 5 provides an overview of the methodology Openreach uses to derive rental prices.[73] In summary, PIA rental prices generally comprise two parts:[74]

- Asset costs: a contribution to the cost associated with the underlying asset to which access is granted. The methodology specifies how the total 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 should be recovered from the telecoms provider gaining access.

- 'Productisation' costs: a contribution to the costs incurred by Openreach in setting up the PIA product (e.g. process design and systems development costs), plus the ongoing costs incurred by Openreach in processing PIA orders.

6.8 The specific methodology adopted by Openreach to derive rental prices is just one of a number of possible ways in which rental prices could be set. Under the existing basis of charges obligation, Openreach has freedom to revise the methodology. As asset costs make up a high proportion of overall rental prices (more than 50% in some cases[75]), a change in the way these costs are allocated or apportioned to PIA users could result in a significant change in rental prices.[76]

6.9 Moreover, in light of our goal of encouraging network competition, we consider that BT may have a stronger incentive than it had in the past to exploit this flexibility in order to undermine investment by competitors.

6.10 Therefore, we are concerned that the current basis of charges condition may not provide potential investors with sufficient certainty as to the level of PIA rental prices they would face.[77] In particular, given the potential importance of PIA rental charges to the overall costs of investing in a rival network using Openreach's physical infrastructure, we are concerned that a lack of certainty could undermine the investment case, and therefore the effectiveness of the PIA remedy.[78]

Question 6.1: Do you think that the flexibility afforded to BT under the current basis of charges condition is a concern?

[73] In this initial consultation, we do not set out the methodology Openreach uses to derive rental prices in detail. However, if requested by stakeholders, we will seek to arrange an industry workshop in January 2017 for Openreach to provide a more detailed explanation of the methodology.
[74] Rental charges for cable up a pole and pole top equipment do not include any productisation costs.
[75] Based on the updated PIA pricing model provided to Ofcom on 12 August 2016.
[76] When we imposed the PIA obligation in 2010, we said that our interpretation of the basis of charges obligation 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 obligation – information provided by Openreach suggests that PIA rental prices based on DSAC would be between 1.2 and 3.2 times higher than the current PIA rental prices (based on the updated PIA pricing model provided to Ofcom on 26 October 2016). 2010 WLA Statement, paragraphs 5.58 and 5.79. https://www.ofcom.org.uk/consultations-and-statements/category-2/wla
[77] Although telecoms providers can bring a dispute if they consider BT's prices do not comply with the basis of charges condition, resolving the issue will take time and so create a period of uncertainty.
[78] PIA rental charges in a given year will be modest compared to the significant upfront costs of deploying a network. However, network investment decisions are typically evaluated over a relatively long time period, over which time total PIA rental charges could represent a material proportion of total costs.

Appropriate form of regulation for rental prices

6.11 In light of the above, we consider a change in the approach to regulating prices may be warranted to provide greater certainty to investors.

6.12 A charge control (specifically, a cap on the level of rental prices) would provide greater certainty over the level of PIA rental prices for the period under review.

6.13 If we decided it was appropriate to impose a charge control, we would need to decide on the appropriate approach to setting the level of charges, balancing a number of objectives. In particular, any approach needs to be appropriate for the purposes of promoting efficiency, promoting sustainable competition and conferring the greatest possible benefits on end users. Any approach also needs to take into account the extent of BT's investments.

6.14 Were we to set a charge control based on the broad approach we typically use in some other charge controls (i.e. a price cap based on BT's fully allocated costs), we anticipate that there would be a number of issues which make setting the level of charges for this review period challenging.

- Such an approach is likely to be dependent on forecasts of costs and volumes.[79] Given the considerable uncertainty about take-up of PIA by other telecoms providers at this stage of implementation of our DCR strategy, our initial view is that the risk of forecast error seems particularly high.

- It is also challenging to set PIA rental prices for the current products at a level which would ensure that other telecoms providers are not at a disadvantage compared to BT (i.e. there is no material difference between the level of internal and external contribution). This is because 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.[80] In order to be able to do this, BT would need to change the way it reports physical infrastructure within its regulatory financial accounting systems. This could take a significant amount of time for Openreach (in discussion with us) to investigate and implement.

6.15 In light of these challenges, we have considered whether there are other approaches that might be appropriate to achieve the aim of providing greater certainty in relation to the level of PIA rental prices from the start of this review period.

6.16 Our initial view is that it may be appropriate to set a charge control (i.e. a cap) based on BT's current methodology for calculating PIA rental prices (although we propose some changes to this below). This would provide certainty to investors over the market review period and would result in PIA rental prices being at a level which should avoid undermining network investment.

[79] For example, forecasts of total physical infrastructure costs and volumes, as well as forecasts of internal and external consumption of physical infrastructure.
[80] 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 prices for different types of duct on a per metre basis, as well as separate rental prices 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).

6.17 We have considered whether adopting this approach could have a material impact on BT's ability to recover the costs of physical infrastructure. In particular, whether there is a risk that the level of PIA prices could undermine BT's recovery of physical infrastructure costs if BT loses customers to a rival access network built using PIA. Although we cannot robustly compare the internal and external contribution to physical infrastructure costs, our initial view is that there would not be a material impact on BT's ability to recover the costs of its physical infrastructure during the review period. This is primarily because the rate at which a rival network can be deployed will limit the extent of any impact on BT. In addition, external PIA users contribute to physical infrastructure costs on the basis of the amount of physical infrastructure used, and so will begin contributing from the start of network deployment and before they establish a customer base on any new network.

6.18 We welcome views from stakeholders on this approach, and any other possible approaches.

Question 6.2: Do you agree with our assessment of the challenges of undertaking our own charge control modelling at this stage?

Question 6.3: What are your views on setting a charge control based on the current methodology? Do you have alternative suggestions for how we might set a charge control?

6.19 Another potential way to provide some greater certainty over the level of PIA rental prices would be to impose a basis of charges condition similar to the one currently in place, but supplemented with further guidance. The aim would be to provide greater certainty on the approach that Ofcom would take as its starting point to assessing PIA rental prices under the basis of charges condition, potentially specifying particular aspects of the methodology Ofcom might adopt. In particular, we would expect guidance to set out Ofcom's starting point for considering the appropriate allocation of physical infrastructure costs to external PIA users under the basis of charges condition.[81]

6.20 We recognise that there may be challenges in providing effective guidance in this context, so that both BT has sufficient certainty on the extent of flexibility it has regarding pricing, and competing telecoms providers have sufficient information and certainty to support investment. We are also aware that any such guidance would not itself have legal effect and that any subsequent assessment would be decided on its merits and on the material presented at the time of any assessment.

6.21 We invite views from stakeholders on whether further guidance would be useful, and if so, what that guidance might cover.

Question 6.4: What do you think about the option of supplementing the existing basis of charges condition with guidance? What do you think the guidance should cover?

Question 6.5: Are there other options for providing greater certainty which we have not identified?

[81] For example, guidance could state the expectation that allocations should be consistent with the principle of equivalence, recognising that further detail would likely be required to provide sufficient certainty to potential investors.

Changes to the current methodology for calculating PIA rental prices

6.22 If the current methodology for calculating PIA rental prices remains the basis for pricing over the market review period (for example, if we maintain the basis of charges condition or impose a charge control based on the current methodology) we have identified a number of aspects of the current methodology which we consider should be revised in light of our other proposals.

6.23 In particular, our initial view is that the component of PIA rental prices that recover productisation costs should be removed from the rental charge and recovered in another way.[82] This would result in a reduction in most rental prices under the current methodology. There are two categories of productisation costs: the upfront costs incurred by Openreach in setting up the PIA product and the per order costs incurred by Openreach in processing PIA orders.

Upfront costs

6.24 As explained in Section 5, we are proposing that Openreach should recover the costs of improving its systems related to the exchange of infrastructure records with telecoms providers across all users of its physical infrastructure, including BT itself. This is in contrast to the way similar costs were expected to be recovered when the PIA remedy was first introduced. Specifically, upfront costs incurred in first setting up the PIA remedy are currently recovered through charges for PIA rental in the 'productisation' component.

6.25 Therefore, we consider that this aspect of the calculation needs to be updated. Our initial view is that the upfront costs actually incurred, but not yet recovered, should be recovered in the same way as new systems development costs, i.e. across all users of the physical infrastructure.[83] Any costs incurred by Openreach in its more recent development of the online planning tool (see paragraph 2.26) should also be recovered in this way.[84] This is for the same reasons as set out in paragraphs 5.20 to 5.21.

Per order processing costs

6.26 Under the current methodology, some of the costs of manually processing orders are recovered through PIA rental charges.[85] As these costs are incurred on a per order basis, assumptions about PIA take-up are used to forecast total order processing costs and in turn determine the contribution each PIA product makes to these costs.

[82] Our proposals in respect of productisation costs would mean that PIA rental prices comprise only asset costs. We would also need to reflect the inclusion of PIA-related costs which we are proposing should be recovered across all users of the physical infrastructure.
[83] The current methodology includes a forecast of upfront costs, and the contribution each PIA product makes is based on assumptions about PIA take-up. However, our understanding is the total upfront cost actually incurred by Openreach since 2010 is considerably lower than forecast, reflecting the fact that the industrialisation of the PIA product was never undertaken. Similarly, actual take-up of PIA has turned out to be much lower than the assumptions modelled. However, this has meant that Openreach has not yet fully recovered the upfront costs it has incurred.
[84] We also consider that a similar approach should apply to the SG&A costs each year which Openreach currently includes in PIA rental charges.
[85] Some manual order processing costs are recovered explicitly through ancillary activities and charged based upon the amount of time required to process e.g. validation by a planner of reservation and build requests.

6.27 Going forward, the cost of processing each order might be expected to change due to our proposals in relation to the planning and survey processes, and associated systems. We therefore consider that this aspect of the calculation needs to be updated.

6.28 Our initial view is that these costs should not be recovered via rental prices since this approach requires assumptions about PIA take-up which is inherently uncertain and so is likely to risk over-recovery or under-recovery of these costs. We consider that it may be more appropriate to recover any order processing costs across all users of the physical infrastructure, but we welcome views from stakeholders on the most appropriate approach.

Question 6.6: Do you agree with our proposed approach to upfront costs?

Question 6.7: Do you agree with our proposed approach to per order costs? What do you think is the most appropriate approach to the recovery of these costs?

Commencement of rental charges

6.29 Currently under PIA, a telecoms provider incurs rental charges from the date at which it orders capacity in Openreach's infrastructure and this capacity is reserved. In cases where the reserved duct is immediately available to the telecoms provider to deploy its network this appears a reasonable approach.

6.30 However, 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 not be able to offer services) until the additional capacity is provided. In such circumstances, and where Openreach has the responsibility for completing the build work, we consider it may be more appropriate for rental charges to become payable only on completion of the PIA order including delivery of the additional capacity.[86] This would mean that a telecoms provider would only incur rental charges from the point at which it is able to fully deploy its network relating to the order.

6.31 In addition, our initial view is that there would be benefits of enabling telecoms providers to start deploying their networks (i.e. occupying the infrastructure that is immediately available) without incurring rental charges whilst waiting for Openreach to provide the additional capacity requested in other parts of the local access area included in that order.

6.32 We recognise that the rules around such a charging mechanism would need to defined carefully at a more granular level. For example, it may be appropriate to bound the size of an order for which rental charges could be deferred pending completion of build works (e.g. to an area relating to an optical local exchange) or to exclude build works with particularly long lead times. We would need to consider whether and how the mechanism should be bounded in these circumstances. As part of this consultation we are seeking views from stakeholders about this aspect of the charging mechanism.

[86] In circumstances where the telecoms provider is responsible for the build work under the self-provision approach, as described in Section 5, and hence in control of the time to deliver, our initial view is that rental charges should not be deferred.

Question 6.8: Do you agree with our initial views around deferring rental charges for PIA? Should the deferral mechanism be bounded and what would be an appropriate way(s) of doing this?

Ancillary charges

6.33 When a telecoms provider requests and uses PIA, it may face charges for ancillary services or activities performed by Openreach on its behalf. These charges currently include:

- charges for accreditation activities;
- charges for processing activities (e.g. providing network records or validating telecoms operators' plans);
- charges for survey activities (applicable in situations where Openreach is required to be in attendance during a survey); and
- charges for new infrastructure build and enabling works.

6.34 Ancillary charges are currently subject to the same basis of charges condition as rental charges. However, our initial view is that there is not the same concern about certainty over the level of these charges, as there is in respect of PIA rental charges. This is because many of these charges reflect largely incremental costs (as opposed to rental charges which reflect common costs to a large extent). Our initial view is that the current basis of charges condition remains appropriate for these charges.

6.35 Although some stakeholders have raised concerns about the current level of particular ancillary charges, we note that some ancillary charges relate to activities which telecoms operators can carry out themselves, without relying on Openreach. Our initial view is to be less concerned about the level of such discretionary charges which telecoms providers have the option to avoid. Conversely, we may be more concerned about the level of charges for services where telecoms providers are dependent on Openreach, especially where these charges are material.

6.36 Some of the existing ancillary charges may become less important or fall away completely given our other proposals in this consultation. For example:

- Our proposals around the recovery of new build and enabling works costs could eliminate ancillary charges in those cases where Openreach is required to carry out these works, as Openreach would instead recover these costs across all products that use the physical infrastructure.[87]
- Concerns about the charges for breaking into Openreach's joint chambers arise primarily because telecoms providers cannot install 'distribution joints' (and other joints that are not in-line) in Openreach's chambers. Our initial view is that Openreach should remove this restriction.

6.37 We invite views on whether any of the current ancillary charges are problematic and/or whether stricter controls on any of these charges are required, in light of the other proposals set out in this consultation.

[87] Openreach could still offer to carry out works which it is not required to do so, and set charges for this.

Question 6.9: Do you think the current basis of charges condition is sufficient for regulating ancillary charges?

Question 6.10: Are there any ancillary charges which you think are problematic?

Question 6.11: Are there any other issues with PIA pricing which we have not identified?

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 31 January 2017**.

A1.2 We strongly prefer to receive responses via the online form at https://www.ofcom.org.uk/consultations-and-statements/category-2/wholesale-local-access-market-review-proposals-PIA. 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 3. 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 second consultation in spring 2017 and a statement by the end of 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

Tel: 020 7981 3601
Email steve.gettings@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.

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 3

Consultation questions

A3.1 This consultation requests responses on:

Developing an effective PIA remedy

Question 3.1: Do you agree with our aim of ensuring that other telecoms providers are not at a material disadvantage compared to BT's own internal consumption of duct and pole access?

Question 3.2: Do you agree with our approach to focus on two main areas of equivalence, processes and costs?

Question 3.3: Do you agree that when BT installs ultrafast broadband services itself at scale it should use the same processes and systems as those used by other telecoms providers that consume PIA as far as is practicable?

PIA scope

Question 4.1: Do you agree with our assessment that broadening the uses of the PIA remedy could allow telecoms providers to design their networks flexibly, respond better to changes in consumer demand and provide innovative services?

Question 4.2: Do you agree with our definition of economies of scope? Do you agree with our overall assessment on the economies of scope and their likely sources?

Question 4.3: In relation to your fibre deployments plans, if any, can you provide us with any evidence regarding the economies of scope your company is likely to achieve if leased lines are allowed as part of a fibre-based broadband deployment?

Question 4.4: Do you agree with our assessment on the potential options to relax usage restrictions, their benefits, risks and challenges? Is there any additional option we should consider? What do you consider to be the best option?

Question 4.5: In your opinion, how can we design and enforce a mixed usage rule? What characteristics should it have and how can it be enforced? Do you think a mixed rule would materially constrain telecoms providers' network designs and business plans?

Question 4.6: In your opinion, how can we design and enforce an any usage rule? What characteristics should it have and how can it be enforced? Do you think an any usage rule, limited to the local area, would materially constrain telecoms providers' network designs and business plans?

PIA process

Question 5.1: Have we correctly identified the problems currently faced by telecoms providers using PIA in relation to planning and surveys?

Question 5.2: Do you agree with our initial views around how the planning and survey systems and operational processes should be improved under PIA?

Question 5.3: Do you agree with our initial views around how systems development costs should be recovered?

Question 5.4: Have we correctly identified the problems currently faced by telecoms providers using PIA in relation to the network deployment stage?

Question 5.5: Do you agree that the PIA remedy will be ineffective if Openreach is not required to make adjustments to its infrastructure?

Question 5.6: If so, do you have any views on how the limit on Openreach's requirement to make adjustments should be specified?

Question 5.7: How should certainty about delivery of build works be improved?

Question 5.8: Could a self-provision model work in practice? Are the benefits of self-provision sufficiently large to warrant adopting this approach or would it be better to improve the delivery of build works by Openreach through, for example, introducing a set of SLAs and SLGs?

Question 5.9: Would there be merit in adopting both approaches (i.e. Openreach required build and self-provision), perhaps allowing self-provision for specific types of build works where close coordination is required?

Question 5.10: Do you agree with our initial views relating to improving the process for enabling works by allowing telecoms providers greater opportunity to carry out these activities?

Question 5.11: What, if any, SLAs and SLGs should apply to the process for enabling works?

Question 5.12: Do you agree with our initial views relating to the relaxation of cable joints restrictions? Are there other technical specifications that we should consider to ensure telecoms providers are able to deploy access networks in an efficient manner and on an equivalent basis to BT?

Question 5.13: Have we correctly identified that replacing dropwires would be a simple and low cost option where poles are capacity constrained?

Question 5.14: Have we correctly identified the particular problems for telecoms providers using PIA where there are overhead lead-ins?

Question 5.15: Under our proposed approach to cost recovery for build works are there remaining issues for telecoms providers using Openreach's poles for overhead lead-ins that represent barriers to the use of PIA?

Question 5.16: Do you agree with our initial view that a dropwire upgrade approach could provide an effective and viable remedy for overhead lead-ins?

Question 5.17: If we were to take forward a dropwire upgrade approach for overhead lead-ins what are the specific issues that we would need to address in developing the PIA remedy?

Question 5.18: If we were to take forward a dropwire upgrade approach should this apply to all overhead lead-ins or only where a pole is capacity constrained?

Question 5.19: Do you agree with our initial views for how duct lead-ins should be treated under PIA?

Pricing of PIA

Question 6.1: Do you think that the flexibility afforded to BT under the current basis of charges condition is a concern?

Question 6.2: Do you agree with our assessment of the challenges of undertaking our own charge control modelling at this stage?

Question 6.3: What are your views on setting a charge control based on the current methodology? Do you have alternative suggestions for how we might set a charge control?

Question 6.4: What do you think about the option of supplementing the existing basis of charges condition with guidance? What do you think the guidance should cover?

Question 6.5: Are there other options for providing greater certainty which we have not identified?

Question 6.6: Do you agree with our proposed approach to upfront costs?

Question 6.7: Do you agree with our proposed approach to per order costs? What do you think is the most appropriate approach to the recovery of these costs?

Question 6.8: Do you agree with our initial views around deferring rental charges for PIA? Should the deferral mechanism be bounded and what would be an appropriate way(s) of doing this?

Question 6.9: Do you think the current basis of charges condition is sufficient for regulating ancillary charges?

Question 6.10: Are there any ancillary charges which you think are problematic?

Question 6.11: Are there any other issues with PIA pricing which we have not identified?

Annex 4

Risk to BT's cost recovery from relaxing usage restrictions

A4.1 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, especially where these are subject to limited or weak competition. As a consequence, Openreach may see a reduction in its leased lines volumes which may affect BT's ability to recover its cost from regulated products.

A4.2 The potential cost recovery implications will depend on a number of factors, including the extent of PIA take-up for business connectivity services, the competitive response by BT, and changes in consumers' demand and technology over time.

A4.3 By way of illustration, we have sought to identify the regulated services which we think may come under greater competitive pressure as a result of relaxing usage restrictions, and the costs associated with these services that might theoretically be at risk based on BT's volumes and costs in 2014/15.[88] Specifically, we estimate the pool of cost at risk by considering an extreme case, in which all regulated leased lines identified as being at risk are replaced by leased lines supplied by telecoms providers using PIA.[89]

A4.4 Figure A4.1 summarises our approach. The steps are as follows:

i) **Column 1:** In 2014/2015, BT's fully allocated costs (FAC) of regulated services in the business connectivity markets totalled £917m.[90]

ii) **Column 2**: For the purposes of this illustrative analysis, we assume that Traditional Interface (TI) services are unlikely to be subject to significantly greater competitive pressure as a result of relaxing usage restrictions and therefore

[88] We have used BT's published 2014/2015 Regulatory Financial Statements (available at http://www.btplc.com/Thegroup/RegulatoryandPublicaffairs/Financialstatements/2015/). We have also used BT's Additional Financial Information AFI-29 which it provides to Ofcom on an annual basis for DLRIC information.
[89] Given that the analysis is based on 2014/2015 data, we take into account the regulatory framework in force at that moment (as per BCMR 2013).
[90] 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).

exclude the FAC of TI services from our assessment.[91] This leaves the FAC of Multiple Interface (MI) and Alternative Interface (AI) services.[92]

iii) **Column 3:** Not all of the FAC attributed to these lines would be at risk since the FAC includes certain costs that would be avoided in the event that Openreach loses a leased line to a telecoms provider using PIA. For the purpose of this exercise, which is illustrating an extreme case, the only deduction we make is to exclude the active equipment costs. We classify the remaining costs in the third column into two categories: costs that are common across markets (in green),[93] which are likely to be unavoidable, and other costs (in pink),[94] which most likely comprise a mix of avoidable and unavoidable costs. We would expect the relevant set of costs at risk to include the common costs but only a proportion of the other costs.

iv) **Column 4:** Our initial view is 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). As a result, telecoms providers would not be allowed to use PIA to build fixed backhaul connections. Therefore, we exclude the costs associated with pure backhaul services (Ethernet Backhaul Direct, Backhaul Extension Services and Main Links), as well as a proportion of the costs associated with other leased lines services reflecting the extent to which they are used for backhaul purposes.[95]

A4.5 Based on the above, as a result of relaxing usage restrictions, the costs corresponding to the pool of services that might be at risk in this extreme illustration would range between £174m and £243m.

[91] 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 assume that rivals to BT will not enter the market to provide low bandwidth TI services using PIA. In addition, in past BCMRs including the 2016 review, we concluded that newer generation services were not a substitute for these legacy services. Hence, we assume that competitive pressure from newer generation services using DPA would not materially impact TI service prices.

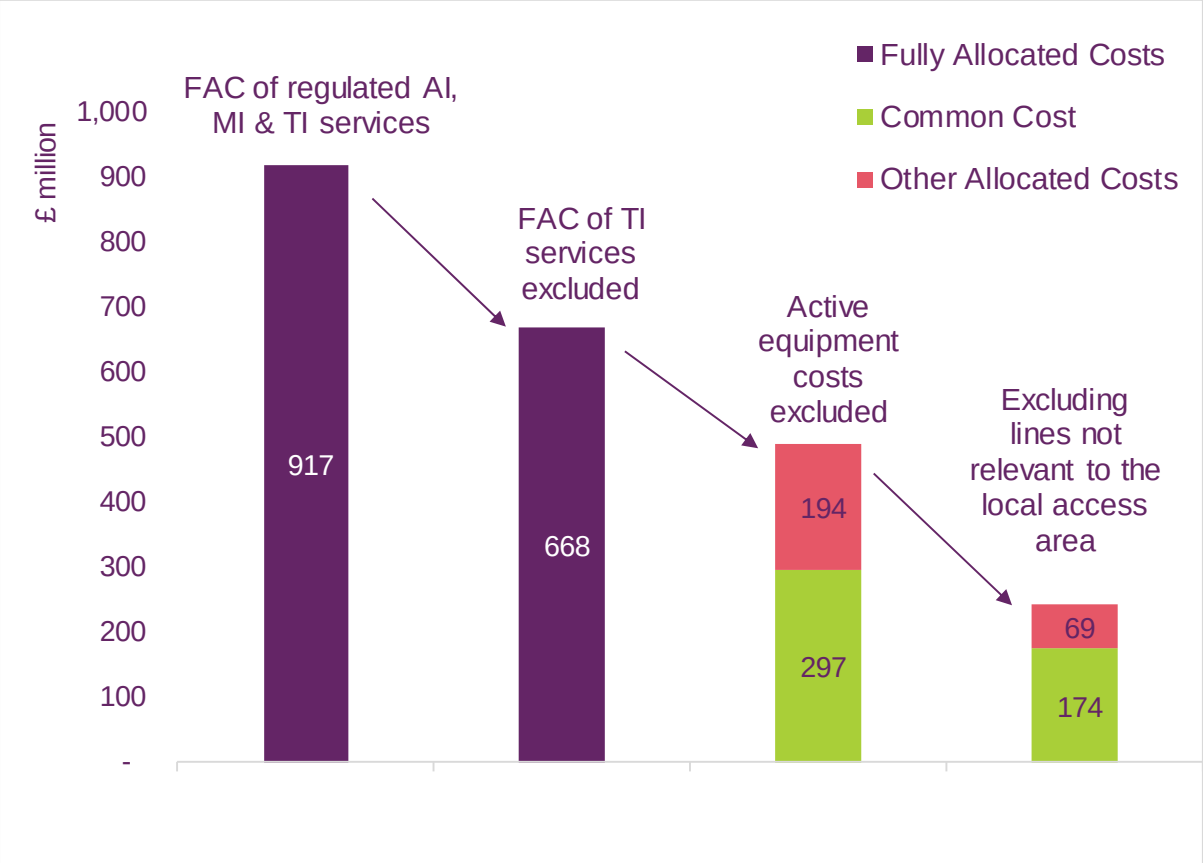
[92] The MI and AI markets defined in BCMR 2013 were replaced by the market for Contemporary Interface Symmetric Broadband Origination Services (CISBO) in BCMR 2016. See footnote 116 of BCMR 2016.

[93] Common costs across markets (in green) are calculated as FAC minus DLRIC.

[94] Other costs are calculated as DLRIC minus Ethernet Electronics.

[95] We used an inventory of all Openreach's leased lines to identify the percentage of services which are used for connectivity between network nodes. The inventory was provided by BT on April 17, 2014, as a part of the BCMR 2016. For example, on average, 7% of 10/100 Mbit/s connections are node to node. Therefore, we assumed that 93% of the costs of 10/100 Mbit/s Ethernet Access Direct (EAD) and Wholesale Extension Services (WES) circuits should be included in the pool of costs at risk, but the remaining 7% are excluded. Similarly, for higher bandwidth segments we find the following proportions of lines are not node to node: 82% for EAD LA 1Gbit/s, 62% of EAD other 1Gbit/s, 81% for WES 1Gbit/s and 55% for MI (WDM) services and 60% of WES above 1Gbit/s.

Figure A4.1 Estimated cost allocated to BT's regulated services



A4.6 It is unlikely that all regulated AI and MI leased lines in the wholesale local access area would be switched to PIA-based alternatives. For example, there are likely to be significant switching costs in replacing existing leased lines (see Section 4). Therefore, we would only expect Openreach to lose a proportion of the services that we have identified to be at risk.

A4.7 Moreover, whether PIA usage restrictions are removed completely in the local access area, or a mixed rule is imposed is likely to have some bearing on the proportion of volumes that are lost (and therefore the actual impact on BT's common cost recovery). For example:

- If any usage of PIA was allowed in the local access area, it is possible that BT would lose a material proportion of the lines among those at risk. By way of illustration, if BT lost a third of the lines among those at risk the cost recovery shortfall could be expected to be around £80m a year.[96] As an illustration, if such cost shortfall was recovered across all Openreach residential lines, it would increase wholesale monthly rentals by around £0.30.[97]

- Under a mixed rule, we would expect a lower impact on the ability to recover costs. Telecoms providers would only be able to replace Openreach leased lines

[96] Considering that volumes are likely to be lost gradually rather than immediately, this figure overstates the cost shortfall at the beginning of the market review period.
[97] According to Ofcom's Telecommunications Market Data Update Q2 2016 (dated 26 October 2016) there were 21.8m Openreach residential fixed lines in the UK as of 2015. See table 7.

in an area bounded by their broadband deployment. By way of illustration, telecoms providers might only be able to deploy to 10% of the total residential market using PIA within the next market review period. Even if the area where broadband is deployed has a relatively high concentration of regulated leased lines, it would be highly unlikely that more than 25% of BT's business connectivity lines would be at risk due to PIA.[98] Moreover, the telecoms provider would only win a proportion of those lines. This reasoning points to a cost recovery shortfall that is significantly lower (around £20m a year assuming BT loses one third of the 25% of lines at risk).

A4.8 These illustrative 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. In addition, 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 take into account these changes.

[98] This is based on our analysis of postal delivery points by exchange area (described in footnote 40). Even if a telecoms provider reached 10% of the residential premises by covering BT exchanges with the greatest concentration of non-residential premises, this would only allow the telecoms provider to reach 22% of the non-residential delivery points.

Annex 5

Current methodology for deriving PIA rental prices

A5.1 This annex summarises our understanding of the current methodology which Openreach uses to derive rental prices.

A5.2 Openreach currently sets rental prices for a number of PIA products:[99]

- Duct rental (per metre) – different rates apply for lead-in duct, spine duct in a route containing a single bore, spine duct in a route containing two bores, and spire duct in a route containing three or more bores.[100]
- Pole rental (per attachment) – different rates apply depending on whether the attached cable serves a single end-user (i.e. a single drop) or multiple end-users (i.e. a carrier cable). Separate rental charges are levied for placing equipment at the top of a pole (known as 'manifolds'), and for each cable that runs down or up a pole.
- Hosting cables and splices in joint boxes and manholes – there are three products: (i) rental for each sub-duct entering or exiting from the joint box or manhole; (ii) rental for in-line splice hosting (per splice); (iii) rental for housing a cable coil, with different rates depending on the length of cable. For all three products, different rates apply for joint boxes and manholes.

A5.3 PIA rental prices generally comprise two categories of cost:[101]

- Asset costs: a contribution to the costs associated with the underlying asset to which access is granted.
- 'Productisation' costs: a contribution to the costs incurred by Openreach in setting up the PIA product (e.g. process design and systems development costs), plus the ongoing costs incurred by Openreach in processing PIA orders.

Calculation of asset costs

A5.4 Asset costs generally comprise depreciation (net of holding gains), some overheads and a return on capital.[102] The regulatory valuations of the 'duct' and 'poles' assets are taken from the same systems which feed into BT's Regulatory Financial Statements.[103]

[99] The full list of PIA charges can be found in the Openreach price list at: https://www.openreach.co.uk/orpg/home/products/pricing/loadPricing.do
[100] Rental is for sub-duct of diameter up to 25mm.
[101] Rental charges for cable up a pole and pole top equipment do not include any productisation costs.
[102] In the case of poles, the asset costs also include operating costs relating to maintenance, safety assurance and a contribution to repair and capital overheads.
[103] Pole assets are included in the overall 'copper' valuation in BT's Regulatory Financial Statements. Therefore, the methodology splits out pole asset costs from other copper assets such as cables and joints. Only the pole asset costs are included in PIA rental charges.

A5.5 The methodology specifies how the costs associated with 'duct' (which includes joint boxes and manholes) and 'poles' is allocated to the different PIA products.

Asset costs for duct products

A5.6 The costs associated with 'duct' is pro-rated between lead-ins, spine-duct, joint boxes and manholes in proportion to their gross replacement cost.

A5.7 The costs allocated to spine-duct are pro-rated to the different duct nest sizes (i.e. 1 bore, 2 bores and 3+ bores), again based on the gross replacement cost of each duct nest size. This is then divided by the total route metres of that duct nest size to give a cost per metre for each of 1 bore, 2 bores and 3+ bores duct. The rental price per metre for each duct nest size is then based on the actual usage of duct space in that duct nest size, measured in terms of the average number of 25mm diameter sub-duct equivalents in that duct nest size.[104] Specifically, the asset cost component of the rental price is set equal to the cost per metre divided by the average number of 25mm sub-duct equivalents in that duct nest size. A cap is applied to ensure that rental prices do not amount to more than 50% of any duct route cost.

A5.8 The cost allocated to lead-ins is divided by the total route metres of lead-ins to give a cost per metre. This is then divided by the average number of sub-ducts (which is assumed to be the same as the average number of 25mm sub-duct equivalents in 1-bore spine duct) to give the asset cost component of the rental price per metre for lead-ins. The 50% cap is not applied as the duct is expected to be used exclusively by one telecoms provider.

Asset costs for joint box and manhole products

A5.9 As explained above, joint box and manhole costs are a subset of the costs associated with 'duct'.

A5.10 The cost per joint box (or manhole) is calculated by dividing the total cost allocated to joint boxes (or manholes) by the total number of joint boxes (or manholes).

A5.11 A small proportion of the cost allocated to joint boxes and manholes is recovered via cable coil hosting and in-line splice hosting.[105] For the purposes of calculating the asset component of rental prices for each sub-duct entry, the cost per box is adjusted downwards to remove the costs that will be recovered from rental prices for cable coil hosting and in line splice hosting rental.

A5.12 The asset component of the rental price for each sub-duct entry in a joint box (or manhole) is calculated by dividing the cost per joint box (or manhole) – adjusted downwards as discussed above – by the average number sub-ducts entering joint boxes (or manholes).

A5.13 For cable coil hosting and in line splice hosting in a joint box, the cable coil / splice is assumed to occupy one third of a box but only large boxes can be used (which are assumed to be four times the cost of an average box). The cost per box is therefore divided by three and multiplied by four, to give the asset component of the

[104] i.e. the actual space used by BT's cables and sub-ducts is converted into the equivalent space that would be occupied by 25mm diameter sub-ducts.
[105] Take-up of these products was not expected to be significant.

rental price for a medium length cable coil or in-line splice in a joint box. The asset component of the rental price for a small cable coil in a joint box is 50% lower, and for a large cable coil in a joint box is 50% higher.

A5.14 For cable coil hosting and in line splice hosting in a manhole, a cable coil / splice is assumed to occupy around 12% of a manhole, and so the cost per manhole is multiplied by 12%. This gives the asset component of the rental price for a medium length cable coil or in-line splice. The asset component for small or large cable coil rental is derived in the same way as for joint boxes.

Asset costs for pole products

A5.15 The costs associated with 'poles' is first allocated between attachments, manifolds and 'cable up pole'.

A5.16 The costs allocated to attachments is then divided by the number of poles to give a cost per pole. This cost per attachment – which differs depending on whether it is a single or multi premises attachment is then calculated as follows:[106]

5.16.1 For single premises attachments, the cost per pole is divided by the forecast average number of attachments for poles with single premises attachments.[107]

5.16.2 For multi premises attachments, the cost per pole is divided by the forecast average number of attachments on poles with multi premises attachments.[108]

A5.17 Costs allocated to manifolds are divided by the number of poles to produce a cost per pole. This is then divided by the forecast average number of manifolds per pole.[109]

A5.18 Costs allocated to 'cable up pole' are divided by the number of poles to produce a cost per pole. This is then divided by the forecast average number of cables running up or down a pole.[110]

Calculation of productisation costs

A5.19 As noted in Section 6, there are two broad categories of productisation costs:

[106] Given that some poles have both single and multi-premises attachments, the approach described here would lead to an over-recovery of costs without an adjustment. Therefore, an adjustment is made to reduce the costs by using a 'scaling factor' which is calculated by dividing the total cost which needs to be recovered by the total cost which would be recovered without any adjustment.
[107] The forecast average number of attachments for poles with single premises attachments is assumed to be equal to the average number of BT attachments on the basis that external PIA attachments are assumed to substitute BT attachments.
[108] The forecast average number of attachments for poles with multi premises attachments is assumed to be equal to the average number of BT attachments plus one (external PIA attachments are not assumed to be substitutional).
[109] The forecast average number of manifolds is assumed to be equal to the average number of BT manifolds plus the number of distribution point poles.
[110] The forecast average number of cables running up or down a pole is assumed to be equal to the average number of BT cables multiplied by 1.8.

- Upfront costs: the current methodology includes a forecast of upfront costs, and the contribution each PIA product makes is based on assumptions about PIA take-up.[111]

- Per order processing costs: some of the costs of processing orders are recovered through PIA rental charges. Manual processing costs are based on a detailed bottom-up estimate of the time taken to process an order. Assumptions about PIA take-up are used to forecast total order processing costs and in turn determine the contribution each PIA product makes to these costs.[112]

A5.20 Total productisation costs are allocated between 'duct' (which includes manholes and joint boxes) and 'poles' based on the number of metres of each (i.e. total duct metres and total aerial metres). Productisation costs allocated to 'duct' are allocated between lead-ins, spine duct, joint boxes and manholes in proportion to the asset costs allocated to these products.[113] Productisation costs allocated to 'poles' are recovered wholly from pole rentals for attachments.

[111] There are also some ongoing fixed costs relating to SG&A.
[112] All forecasts relate to the five year period following the introduction of the PIA remedy.
[113] The productisation component in cable coil hosting and in line splice hosting rental prices is assumed to be double the productisation component in rental prices for entering or exiting from a joint box or manhole.