



House of Commons  
Culture, Media and Sport  
Committee

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# **Establishing world- class connectivity throughout the UK**

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**Second Report of Session 2016–17**





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# Establishing world- class connectivity throughout the UK

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**Second Report of Session 2016–17**

*Report, together with formal minutes relating  
to the report*

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13 July 2016*

## The Culture, Media and Sport Committee

The Culture, Media and Sport Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Department for Culture, Media and Sport and its associated public bodies.

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Committee reports are published on the Committee's website at [www.parliament.uk/cmscom](http://www.parliament.uk/cmscom) and in print by Order of the House.

Evidence relating to this report is published on the [inquiry publications page](#) of the Committee's website.

### Committee staff

The current staff of the Committee are Elizabeth Flood (Clerk), Katy Reid (Second Clerk), Kevin Candy (Inquiry Manager), Johnnet Hamilton, (Inquiry Manager), Hannah Wentworth (Senior Committee Assistant), Keely Bishop (Committee Assistant) and Jessica Bridges-Palmer (Media Officer).

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## Summary

Digital connectivity is vital to our lives. It now underpins nearly all areas of the economy, it plays a crucial role in our culture and society, and it is increasingly central to our health and wellbeing. The purpose of this inquiry has been to explore how the full benefits of digital connectivity can be extended to all, regardless of location, across the UK.

The goal of providing better, wider access to fast broadband and mobile services has been a Government priority since 2010. So far the UK has done well compared to other EU countries on the provision of superfast broadband services in terms of geographic coverage, take up and lower prices, all achieved through a competitive market. Over £1.7 billion of public money is expected to be invested in closing the digital divide that has emerged between those who do and do not have access to faster services, mainly but by no means entirely in rural areas.

However, while the Government's broadband programme, BDUK, is on track to deliver access to 95% of premises with superfast services by the end of 2017, there is a serious public concern that the UK is not adequately investing in critical telecoms infrastructure. The UK is a laggard by international standards in providing fibre connectivity. This could result in a widening, not a narrowing, of the digital divide; especially as demand for faster services escalates after 2020.

UK broadband access infrastructure is dominated by BT's local access network subsidiary, Openreach. Openreach, local bodies and BDUK are to be congratulated for hitting their 90% coverage target for superfast broadband. But one consequence of this rapid rollout has been that the programme appears to have tackled the easier-to-reach premises within the interventions areas first and has not delivered coverage to whole areas. Instead, it has left a patchwork of premises that have not been reached, and created much uncertainty among local residents as to whether or not they will be connected or receive improved speeds.

A further downside of the BDUK programme has been the lack of transparency in Openreach's costs and deployment plans, the apparent effect of which has been to stifle local competition and thwart other network providers' planning. At the same time, Openreach's historically poor service record has failed to improve in the face of escalating demands on the network.

One difficulty in driving forward the BDUK programme is the need not to discourage private investment in infrastructure by preferring one technology over others, when that technology may not ultimately be the best for the future. Yet in reaching some of the harder-to-reach premises there will need to be judicious deployments of interim technology solutions to provide improved connectivity to those households and businesses which currently have little or no coverage.

The Government has determined that probably the most effective way of providing access to broadband for those in the "final five percent", whether in rural, urban or suburban not-spots, is through the introduction of a Universal Service Obligation (USO) whereby a householder or a small business would have the legally enforceable

right to an affordable and reliable internet connection. Ideally, a new broadband USO should be designed so as to encourage investment without overly burdening industry, creating consumer detriment or inhibiting take-up. The goal is to raise the minimum standard for all, not to privilege an already well-served minority. As such, there will be no advantage in setting the USO's speed and other specifications too high, especially on introduction.

We believe that the Government is right to follow Ofcom's advice to set the USO initially at a minimum of 10Mbps. However, the need for an increase in the USO minimum download speed to 30Mbps by 2022 is entirely foreseeable, and the Government will need to make active plans for this eventuality. Wherever it is realistic, the Government and Ofcom should ensure that the design of the broadband universal service should use and extend existing commercial and community networks, rather than displacing them.

On the mobile side, the Government and Ofcom have worked well together to secure investment from all four network operators to achieve 90% geographical coverage for voice and text by 2017. Ofcom has successfully designed spectrum auctions so that coverage obligations are a key part of these exercises. To facilitate investment by the operators, the Government may well need to place additional emphasis on achieving coverage, and on the role that mobile will play in meeting the universal service obligation for broadband, rather than primarily maximising revenue from auctions. Ofcom will also need to provide accurate information on mobile coverage so that the consumers can make informed decisions and also hold the mobile network operators to account on their investment and coverage commitments.

A central question throughout our inquiry has related to the nature of BT Group's relationship with Openreach and, relatedly, Openreach's performance in network development and the maintenance of telecoms infrastructure. Although functional separation was a key outcome of Ofcom's 2005 telecommunications review, Ofcom's Digital Communications Review (DCR) this year has made clear its concern at the continuing effects of the embedded conflict of interest between BT as service provider and Openreach as local access infrastructure subsidiary. It has concluded that further reform is required.

Openreach's poor quality of service is one of the single biggest issues highlighted in the DCR. Although standards of service, specifically customer service, are also problematic in the wider industry, Ofcom has in particular identified the quality of Openreach's wholesale service to communications providers, including to BT's businesses, as being highly unsatisfactory.

Further concerns expressed about BT have been that Openreach has been "over-earning" substantially in relation to its cost of capital while Openreach's investments, including in fibre, have until this year barely increased since 2009.

In our judgment, there appears to be compelling evidence that BT Group is exploiting the position of vertical integration to make strategic decisions that favour the Group's priorities and interests, at the expense of its access infrastructure business. BT does not lack access to capital. Its current structure allows it to use Openreach's utility-type



assets to cross-subsidise riskier activities elsewhere in the Group, while significantly under-investing in the access infrastructure and services on which a large part of the public rely.

Ofcom regulates for competition, and its charge control regime has kept a downward pressure on prices, so that the UK's communications prices are among the lowest compared with similar EU countries. But this mechanism has not been successful in holding Openreach to an adequate quality of service; and it is an open question how effective overall it has been in stimulating investment in Openreach's infrastructure.

We now believe there is a pressing need to liberate more of BT's financing for investment in broadband and the evolution of its telecoms infrastructure. As a result there is a need to consider closely BT's governance and capital structures as well as the adequacy of its oversight and regulatory arrangements.

These questions raise a host of formidable technical and financial issues. To help address these, we retained a group of expert advisers including nationally recognised specialists in finance, regulation, communications and infrastructure provision. The expert panel compiled their analysis and conclusions in a separate report, which has been included as an Annex.

It came as a surprise to us that BT employs an investment hurdle rate significantly above Openreach's actual cost of capital, as estimated and allowed for by Ofcom. This means that a potentially very significant amount of annual investment in broadband access and services, investment that would likely add to shareholder value, is not at present being made. While we understand the desire for BT and other providers to balance infrastructure investment with their own commercial interests, this forgone investment in maintaining, upgrading and supporting Openreach's infrastructure is, according to our expert panel, damaging to public welfare, to shareholders and to consumers. BT should therefore take immediate steps to invest further in Openreach infrastructure and services, down to its cost of capital.

We have considered the case for establishing a standalone broadband utility provider using a regulatory asset base model. While the concept of having a single system operator could in theory be conducive to the management of a universal service obligation for broadband, we believe the differences between the communications market and other traditional utility markets make this approach unattractive. In particular, it is not clear how the presence of a utility-style operator would be compatible with promoting competition, or would work successfully alongside current market players such as Virgin Media, to say nothing of the many other smaller providers of broadband access infrastructure, without stifling competition and the growth of alternative networks.

In our judgment, Ofcom set out a very cogent case in its Digital Communications Review for the full separation of Openreach from BT Group. However, it stopped short of making an outright recommendation for such action at that stage given concerns over possible difficulties of implementation, disruption to investment, impact on the BT pension fund, as well as an apparent threat by BT of litigation. It is a very difficult judgment call as to whether the benefits of full structural separation would outweigh

the likely significant disruption and fall-out to the wider industry and consumers. However, there is good reason to suggest that a more independent Openreach might increase infrastructure investment significantly.

We believe Ofcom has been right not to rule out full separation; that option should be kept firmly on the table. Ofcom has said that the proposals BT has offered to date on governance, performance, status and other arrangements of Openreach have not gone far enough. In our judgment Ofcom must remain resolute in its negotiations with BT, to ensure that the reform necessary to establish the quality and availability of communications services needed for UK consumers and businesses is delivered. If the regulator were to place more emphasis on Openreach's quality of service, BT would voluntarily invest more in the infrastructure to avoid significant penalties. Should BT fail to offer the reforms and investment assurances necessary to satisfy Ofcom's and our own concerns, then the regulator will need to set in train the steps to enforce full separation of the Openreach business.

In any event, in order to cement Openreach's independence, we recommend that in future Openreach should be required to develop and publish a five-year strategic investment plan for comment and agreement with the BT Group Board. This would enable it to set out its financial needs, in a transparent and comprehensive manner. Should Openreach remain part of the BT Group under a strengthened model of functional separation, BT should be obliged to allow Openreach to raise finance independently in the capital markets in its own right, and to make investments that meet the business's own cost of capital. We have every reason to believe that Openreach would be a very attractive investment vehicle to longer-term institutional investors, which could in turn facilitate increased investment in infrastructure.

# 1 Introduction

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1. Aiming for ‘world-class connectivity throughout the UK’ could lead in two different directions. One would be towards very fast downloads and uploads of data for the average household. The other would be towards a society where all have a relatively high and cost-effective capacity to participate digitally. The first might include very high bandwidth applications accessed simultaneously by all family members in favoured areas, but not in urban and rural “not-spots”; the second might allow everyone or almost everyone to stay in touch with friends and family via email or video, use online shopping and banking services, do flexible remote working, contact their GP surgery, and have continuous access to news, culture and learning.

2. We favour the second option. At present, a sizeable number of people and businesses lack access to good, reliable and affordable broadband communications; and without that they are at risk of being digitally excluded and left behind. The provision of reliable, sufficiently-fast and accessible broadband and mobile services is fast becoming a necessity. Broadband is increasingly seen as an essential public utility; indeed, as the former Prime Minister suggested last Autumn, a basic right.

3. Compared to other countries the UK’s digital economy has been extremely successful; the sector now contributes about 10% to GDP, almost double that of the USA.<sup>1</sup> Yet over the last few years a key concern has been a growing digital divide between those who have good access to communication services and those who do not. The effect on those in rural areas has been much discussed, but it is startling that access to decent broadband remains a major problem for many small businesses especially in business parks, for homes on new estates across the country and also in city centres, including the heart of London. Affordability and accessibility particularly affect low-income households and those living in areas of relative deprivation; over time these sections of society may be further marginalised.

4. At the start of this Parliament, the Government’s superfast broadband programme—after a stuttering start—got on track to extend superfast coverage, with the goal of giving people and businesses access to speeds in excess of 24 Mbps, to 90% of premises in the country by May 2016. The Government was also working to ensure that superfast broadband would be available to 95% of UK premises by the end of 2017. There remains, however, the difficult question of what will happen to those premises in the “final 5%”, located in the harder-to-reach rural areas and parts of towns and cities with poor connectivity.<sup>2</sup> Problems of access to adequate broadband are frequently made worse by poor mobile availability and lack of services for those travelling by road and rail.

5. With increasing awareness of the importance of broadband, public anger has escalated at the lack of access and poor quality of service. Over the last few years there have been many debates on these issues in the House of Commons, and Members have expressed marked concern that many individuals, households and businesses may never have acceptable access to broadband and mobile services, to the great detriment of themselves, their businesses and their local communities.

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1 The Business, Innovation and Skills Committee has been conducting an inquiry alongside ours into the Digital Economy, specifically focusing on Government actions affecting businesses in the digital sector.

2 The remaining 5% (approximately 1.5 million of premises) is dispersed across 70% of the UK’s landmass with approximately 1% being in urban areas.

6. A key function of the Department for Culture, Media and Sport is to manage the delivery of the superfast broadband programme and improve digital connectivity. In March 2015, the Coalition Government published a Digital Communications Infrastructure Strategy setting out the infrastructure they believed the United Kingdom needed to support a world-leading digital economy over the next 10 to 15 years.<sup>3</sup> The challenge now is extending broadband coverage to all. In that context, this Committee launched an inquiry into the coverage, delivery and performance of superfast broadband in the UK, and into progress being made in extending and improving mobile coverage and services. Clearly BT is a significant player in UK communications, as the custodian of the national infrastructure since its privatisation over 30 years ago, but it is by no means the only significant player in these markets. A key question is how to stimulate increased investment from BT and others into the UK's communications infrastructure.

7. This inquiry is running alongside Ofcom's strategic review of digital communications, which is a comprehensive investigation into the communication markets which takes place every 10 years. The last review recommended the functional separation of BT's access network within BT Group and saw the creation of Openreach in 2005. Openreach oversees the "last mile" of the UK telecoms access network—the copper wires and the fibre that connect homes and businesses to local telephone exchanges. There is now a live debate as to whether and how far this model of access-based competition based on functional separation of Openreach has been successful.

8. We decided to focus on six inter-linked issues: the position of Openreach, given its critical importance to UK communications; the work taking place to increase superfast broadband and mobile availability; the position of the remaining homes and businesses with poor or no connectivity; the Government's proposal for a new Universal Service Obligation for broadband; future-proofing broadband infrastructure through investment in fibre; and concern over quality of service. This report is designed to contribute to the debate around Ofcom's final deliberations in its review.

9. We are grateful to have received views from a wide range of people and organisations which have greatly assisted our inquiry. There were over 100 written submissions from telecoms organisations and industry groups, local councils, consumer bodies, and individuals. We held 11 evidence sessions, one of which took place in the Chilterns. We spent the morning there visiting businesses and other locals which helped us appreciate first-hand how poor connectivity can unfairly affect rural communities. In the afternoon we took formal evidence in Russell's Water, South Oxfordshire. We are very grateful to all the witnesses who gave evidence for their time and advice. In order to bring real technical and financial expertise to bear on these issues, the Committee brought in Professor Jim Norton, Tony Lavender, Professor Tim Jenkinson, and Dr Helen Weeds.<sup>4</sup> Their guidance and advice has been invaluable, and we include their paper as an annex to our report.<sup>5</sup> We give them particular thanks.

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3 <https://www.gov.uk/government/publications/the-digital-communications-infrastructure-strategy/the-digital-communications-infrastructure-strategy>

4 The Committee appointed Professor Jim Norton, Visiting Professor, University of Sheffield, as a specialist adviser at its meeting on 14 October 2015; and also Tony Lavender, Professor Tim Jenkinson, Saïd Business School, University of Oxford, and Dr Helen Weeds, University of Essex and Multimedia Economics Ltd on 22 March 2016. The advisers' relevant interests that were declared at these meetings appear in Annex B of the Committee's Formal Minutes for Session 2015–16, which are available on the Committee's website.

5 p.75

## 2 Where we are today

10. BT is the largest fixed broadband provider in the UK with a retail market share of 36%<sup>6</sup>, Sky has 23%, Virgin Media 19%, and TalkTalk 17.5%.<sup>7</sup> At present, the majority of investment in superfast fibre and cable connections to a cabinet or premises comes from BT and Virgin Media—both are investing in upgrading their existing networks—but smaller providers are investing in fibre deployments, too, such as CityFibre, Gigaclear, Hyperoptic and ITS Technology.<sup>8</sup> In addition, wireless, mobile and satellite technologies provide alternative options for accessing high speed broadband services. This commercial investment has been complemented by public investment through the UK Government's Broadband Delivery UK programme (BDUK). The UK's record on broadband coverage compares favourably on a number of counts with the other leading European Union countries:<sup>9</sup>

- The UK is equal first for standard broadband coverage, second for take-up per 100 households and first for choice.
- For superfast broadband, the UK is first for coverage, first for take-up of connections with headline speeds exceeding 30Mbps and second for choice.
- The UK is equal first for mobile broadband coverage and first for take-up.<sup>10</sup>

The UK also ranks as one of the cheapest for prices of communication services in comparison with the USA and leading European Union countries.<sup>11</sup>

11. While the UK has benefited from healthy competition in communication services, there are geographic areas where the market has not met the needs of consumers and businesses. This has been primarily, but not entirely, because it has not been commercially viable for communications providers to provide access or coverage in some areas. There are several reasons why this has been the case but the most significant one is to do with population density. Other issues that can affect costs especially in towns and cities include access rights and planning considerations, in the absence of a Government commitment to Universal Broadband.

12. A key focus for us in this inquiry has been to examine what progress has been made to achieve near-universal access to good and reliable broadband connections and comprehensive mobile coverage across the UK. When we started our inquiry last year 2.4 million premises were unable to access speeds above 10Mbps, which included over 130,000 SMEs.<sup>12</sup>

### BDUK programme

13. At the start of the last Parliament, the Coalition Government set out its main commitment for broadband in a new strategy, Britain's superfast broadband future.<sup>13</sup> The

6 Including EE's share. Figures from 2015.

7 Enders Analysis—UK broadband, telephony and pay TV trends Q2 2015.

8 Sky, TalkTalk and CityFibre have link up for ultra-fast network deployments in York.

9 Italy, France, Germany and Spain

10 Department for Culture, Media and Sport ([EWC0066](#))

11 Cost and value of communications services in the UK, Ofcom, January 2014

12 Connected Nations 2015, Ofcom, 1 December 2015

13 Britain's superfast broadband future, BIS & DCMS, December 2010.

Government set out to ensure the UK had the best superfast broadband network in Europe by the end of the Parliament in 2015 and to ensure that virtually all homes had access to broadband at a minimum of 2Mbps. In 2013, the Government increased its ambition and allocated additional money to provide 95% of the UK with superfast broadband by 2017. Some of these targets were subsequently put back slightly but the current ones are given in the box below.<sup>14</sup>

#### **Broadband targets**

- to provide a basic broadband service of 2Mbps to virtually all homes by the end of 2015
- to extend superfast broadband (speeds of at least 24Mbps) for 90% of premises in the UK by 2016 (BDUK Phase 1)
- to extend superfast broadband to 95% of the UK by 2017 (BDUK Phase 2); and
- to introduce a Universal Service Obligation for broadband at a minimum speed of 10Mbps in 2020.

14. Rather than have one national contract, DCMS decided that delivery would be delegated to local bodies in England and to the devolved administrations. BDUK was established to run the broadband programme centrally and to oversee the local bodies<sup>15</sup> delivery of their own plans.<sup>16</sup> Its early tasks were to design a national programme for publicly-subsidised broadband to rural areas, to negotiate an umbrella scheme for clearing State Aid rules with the European Commission, and to establish a national procurement framework of suppliers. In the end, despite several companies showing an initial willingness to bid for contracts, only BT and Fujitsu were appointed, and then Fujitsu dropped out.

15. The BDUK programme has used public funding alongside the supplier's commercial investment, principally BT's, with 'the investment gap' in the commercial model covered by a combination of central Government, local authority and EU development money.<sup>17</sup> Central Government has directly committed over £780m in broadband infrastructure and this has been matched by funding from local authorities and the devolved administrations.<sup>18</sup> In addition, the Government has provided £10m to fund pilot projects to test out ways to extend superfast broadband to the final 5% of hard-to-reach premises with technologies such as satellite and wireless and to experiment with new financing models.

16. We understand that BT is contracted to provide £348m of capital expenditure across all Phase 1 contracts and that up to December 2015 it had contributed £268m, at which point the programme was still being delivered.<sup>19</sup> There is a mechanism in place in all local contracts that ensures that if the network build actually costs less than BT's estimated bid,

14 The original target for Phase 1 broadband was May 2015, i.e. at the end of the Parliament.

15 A local body refers to a local authority or a group of authorities working in partnership, devolved Government, or local economic partnership. Devolved governments are accountable for their own projects.

16 BDUK was originally housed in BIS but transferred to DCMS in January 2011.

17 At the outset, BDUK estimated that commercial superfast broadband delivery across all available networks would reach 72% of premises in areas covered by the programme by 2015.

18 £600m of the Government's contribution to superfast broadband was expected to come from a top-slice of the TV licence fee. In addition, central Government has contributed £150m to a SuperConnected Cities Programme.

19 See Department for Culture, Media and Sport ([WDC0001](#)).

then BT is obliged to return the underspend to local bodies.<sup>20</sup> As of March 2016, BT had committed £66.5m of capital expenditure to phase two contracts.<sup>21</sup> BT eventually won all the Phase 1 BDUK contracts, and a substantial proportion of the Phase 2 projects.

17. Criticisms over the design of the programme have been widespread and vigorous.<sup>22</sup> The main one was that the original programme failed to encourage competition and consequently all Phase 1 contracts went to BT. In its recent Digital Communications Review, Ofcom was notably silent regarding any assessment of the performance of the BDUK programme to date. The Committee of Public Accounts (PAC), however, was particularly scathing about BT's insistence on confidentiality clauses which prevented local authorities from publishing or sharing information on BT's costs or details of where BT would be installing superfast broadband.<sup>23</sup> Despite PAC's heavy criticisms, the Government did not take up this issue and BT continued to insist on strict confidentiality terms for its Phase 2 contracts, with a take-it-or-leave-it attitude.<sup>24</sup> Consequently alternative suppliers have had insufficient information to develop plans for their own projects in the final 5 to 10%. In 2014, PAC determined that:

BT's monopoly position should have been a red flag for the Department as it finalised its framework contract with BT, placing greater importance on the other value for money safeguards. But we see the lack of cost transparency and BT's insistence on non-disclosure agreements as symptomatic of BT's strong negotiating position resulting from the lack of competition.<sup>25</sup>

18. Three and a half years on since the EU Commission gave State Aid approval, the programme has provided superfast access to nearly 4 million premises.<sup>26</sup> In March 2016, Chris Townsend OBE, Chief Executive of BDUK, wrote to us providing an update indicating that only three of the 44 BDUK Phase 1 projects were behind schedule: two of these were in Cumbria and Lancashire, where delays had occurred due to extreme weather and flooding, and the third was in Wiltshire which was running behind schedule by approximately 3,000 premises at that time.<sup>27</sup> However, the latest coverage figures from BDUK show that performance across parliamentary constituencies varies greatly and that coverage in some has been extremely poor despite overall coverage across the country reaching 90%.

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20 This mechanism is known as the underspend clawback.

21 In addition to capital expenditure, BT is expecting to incur £450m of operational expenditure under the BDUK programme.

22 There have been two NAO and two Public Accounts Committee (PAC) reports in the past three years on the rural broadband programme.

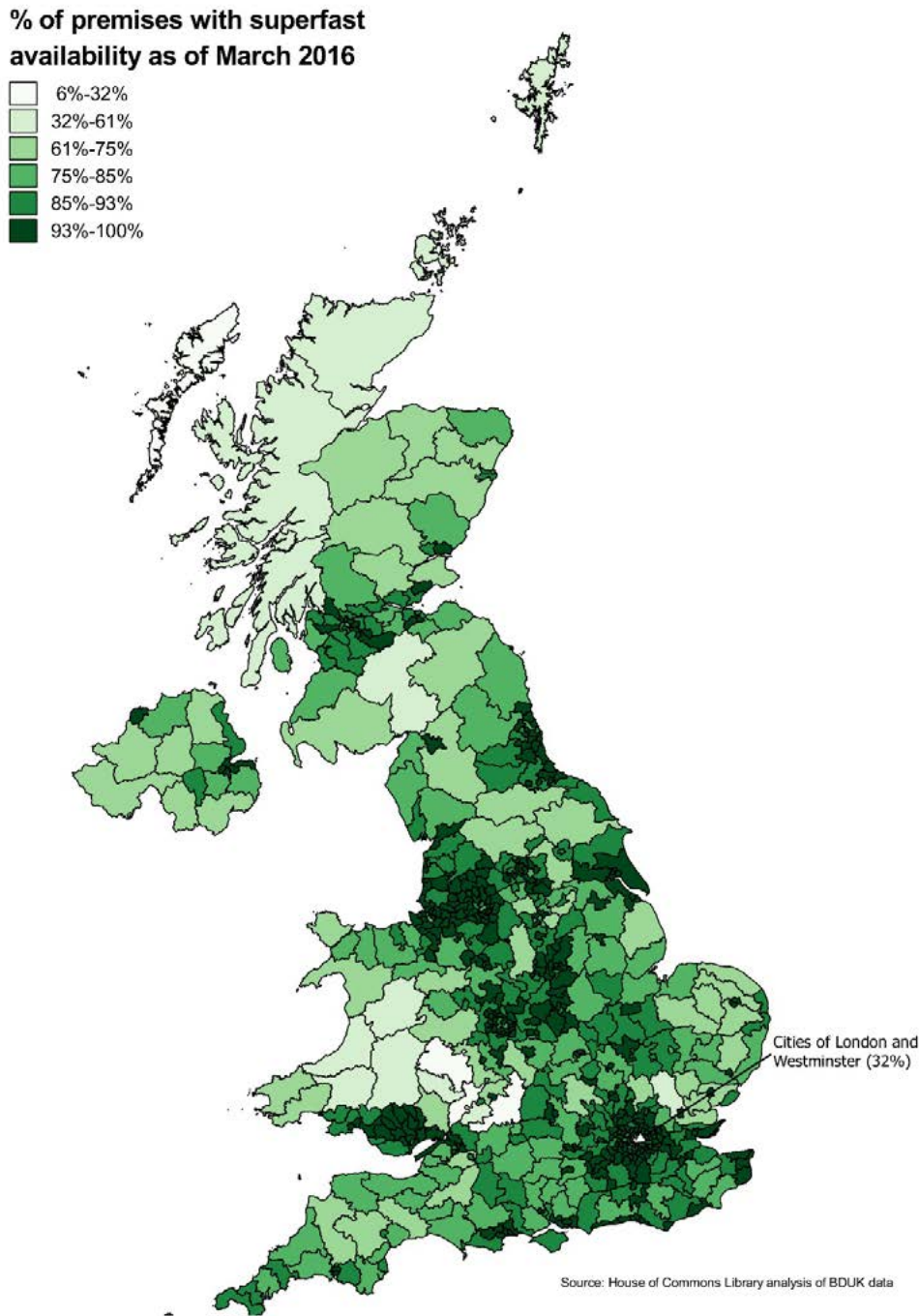
23 Committee of Public Accounts, The rural broadband programme, Twenty-fourth Report of Session 2013–14, HC 474, see conclusions 3 and 6.

24 BT has stated that its costs are commercially sensitive due to the assurance it gives of consistency between costs in its publicly funded and commercial programmes. It argues that any information released about its publicly subsidised programme would allow commercial competitors to understand its technical solutions and costs.

25 Committee of Public Accounts, The rural broadband programme, Fiftieth Report of Session 2013–14, HC 834 para 15.

26 3.84 million premises covered as at the end of March 2016.

27 Chris Townsend OBE, Chief Executive Officer, Broadband Delivery UK ([EWC0110](#)).



19. The remaining holes in coverage may be all the more difficult to fill. West Yorkshire Combined Authority explained that they had situations where the roll out meant that one half of a village had received superfast broadband, and the other half had not, when all the residents had been ready and waiting for it.<sup>28</sup> This was by no means the only example of such a baffling pattern of rollout under the BDUK programme encountered during our inquiry, including similar cases in the constituencies of Members of the Committee. We were also told that the incentive to achieve 90% coverage as quickly as possible had favoured enhancing the services of premises that already received some degree of



broadband connectivity at the expense of the more remote with little or no coverage. There was also the question as to what extent BDUK funding had subsidised deployment that would have taken place anyway on a purely commercial basis.<sup>29</sup>

20. BT has continued to refuse to allow local bodies to publish information on costs, speeds and coverage. Connecting Devon and Somerset (CDS) told us that BT had made non-disclosure a “redline issue” during their Phase 2 negotiations. This has made their relations with residents extremely difficult. For example, CDS had no agreement to show superfast areas on their deployment maps, only fibre delivery or next-generation coverage. This meant that those homes able to connect to a cabinet were shown as receiving a service regardless of whether they were actually able to experience any improvement in broadband speed.<sup>30</sup>

21. In CDS’s experience, the “homes passed” approach<sup>31</sup> had the impact of driving the wrong behaviour from the suppliers as it allowed BT to tackle the easy areas first and leave the more rural areas to last, running the risk that the harder-to-reach areas would not be reached at all. In Devon and Somerset there was evidence of much lower take-up rates across urban and suburban areas when compared to rural and very rural areas where there was poor connectivity.

22. CDS explained that attracting a supplier to invest alongside the public sector to fill in the gaps left by Phase 1 rollout would now be a real challenge. In its opinion, addressing a whole community approach from the outset would have resulted in more efficient use of public resources. However, Ed Vaizey, Minister of State for Culture and the Digital Economy, argued that an “outside-in” approach, where the more difficult-to-reach properties had been tackled first, would have been unjustifiable. He said that it had been right to get to as many people as possible in the fastest possible time and learn on the job— as a result this represented the most effective use of taxpayers’ money.<sup>32</sup>

23. Given the concern over transparency and control over BT’s costs and capital expenditure, we raised this issue with Chris Townsend. He told us that an open-book accounting process<sup>33</sup> was in place to ensure that BT did not overstate its actual network build costs. This was operated by BT and administered by local bodies with support from BDUK.<sup>34</sup> In 2014, the Cabinet Office Major Projects Authority described this system as an exemplar of best practice and recommended that it be promoted across Whitehall.<sup>35</sup> The ‘Milestones to Cash’ process, as it is known, has identified that so far BT has spent £124m less capital expenditure than assumed across contracts.<sup>36</sup> This means that if the network build had now finished, BT would be required to repay £124m to local bodies.<sup>37</sup>

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29 Q353 [Tom Mockridge]

30 Connecting Devon and Somerset ([EWC0106](#))

31 DCMS and BDUK measure superfast coverage by a premises passed metric.

32 Q1125

33 Open-book accounting is a type of supply-chain assurance where suppliers share information about the costs during a specific contract with their client.

34 Nevertheless, a difficulty with the system is reconciling Openreach’s labour costs, which make up a significant part of the capital costs of deployment.

35 Q296.

36 This was the position as at 31 December 2015.

37 Letter from Chris Townsend OBE, Chief Executive Officer, BDUK, to the Clerk of the Committee, dated 25 April 2016.

24. The local contracts are set on a baseline prediction of take-up being 20%. So where take-up is higher, BT is obliged to return £129m for every 10% achieved above the baseline during the contract.<sup>38</sup> To date, BT has set aside £258m of funding to be returned to local bodies as a result of higher take-up than expected than at the bid stage (and has made £129m of this available already).<sup>39</sup> This is funding that will be provided by BT to local bodies to support additional network build. This clawback is a key component of the gap-funding model where the costs of network build are balanced against future revenue. The window for sharing future revenue is in place for seven years after which point BT receives 100% of the revenue earned from its fully-owned infrastructure. There is a question whether the 20% original take-up prediction in all contracts was set too low. In 2013, neither the Department nor BT could tell the PAC what additional sum the Department had paid for transferring the risk of low take-up to BT.<sup>40</sup> Tom Mockridge, Virgin Media's CEO, described the arrangement put in place as being "a bit of an interest-free loan to BT".<sup>41</sup>

25. We have also heard a lot of evidence of overbuilding and market sterilisation arising from both the inflexibility of BT Openreach's and local bodies' rollout schedules and BT's reluctance to share future deployment plans.<sup>42</sup> Some local bodies appeared to have more success in directing BT's plans than others.<sup>43</sup> But the prevailing pattern, we heard, has been that County Councils involved as partners in BDUK only learn whether connections are to take place at individual address level when BT tells them this has happened. This has led to widespread dissatisfaction about the transparency of the programme and the ability of local bodies to give meaningful information to residents and their representatives, including MPs.

26. Regarding overbuilding, Gigaclear estimated that about 45% of all its networks had been partially or substantially overbuilt by BT's superfast broadband networks, either before Gigaclear had started to launch a network or within a few months of its doing so.<sup>44</sup> Under the State Aid rules, publicly-funded projects are required to undertake an open market review and consultation before procurement, to determine which postcodes may be covered. Gigaclear cited 24 incidents to us in Oxfordshire where its networks had been overbuilt by BT's BDUK deployment. In response, Oxfordshire County Council (OCC) explained that when the Council had signed a contract with BT in 2013, although it had excluded some areas from BDUK deployment, as a result of Gigaclear's existing and planned fibre network, some areas were not excluded owing to uncertainty over Gigaclear's size and viability as a relatively new market entrant.<sup>45</sup> Later, once Gigaclear had secured additional investment, OCC explained that de-scoping BT's planned deployment would have been expensive and difficult. When planning Phase 2 areas, and after a second open market review, OCC then excluded any areas being planned or already covered by Gigaclear.

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38 See Q303 [Chris Townsend]; and BT ([EWC0097](#)).

39 Broadband Delivery, presentation by Chris Townsend, SuperConnected Business Conference, 7 June 2016.

40 Committee of Public Accounts, The rural broadband programme, Fiftieth Report of Session 2013–14, HC 834, para 19.

41 Q384 [Tom Mockridge]

42 For example see: Gigabit Broadband Community Interest Company ([EWC0100](#)); County Broadband Ltd ([EWC0074](#)).

43 Q534 [West Yorkshire Combined Authority]

44 Gigaclear ([EWC0098](#))

45 Oxfordshire County Council ([EWC0126](#))

27. OCC also told us that as Gigaclear operated a demand-driven implementation plan, they met regularly so that any areas where Gigaclear had not hit its target rate for deployment, could be modelled instead by BT. This seems necessary, as following our visit to the Chilterns, the local Member of Parliament, John Howell, told us some villages in his Henley constituency were excluded from the BDUK rollout as Gigaclear had expressed an interest in making provision. However, when Gigaclear had not mustered sufficient demand to guarantee a return, it had not proceeded with these villages.<sup>46</sup> While we have no criticism of Gigaclear's financial model, we observe that these villages could also have lost the chance to obtain public subsidy through the BDUK programme.

28. During our inquiry we also heard that, in response to economic difficulties following the 2008 financial crash, Openreach reduced investment in its broadband network. This has resulted in many new housing estates being left without coverage, but it is not the sole reason. In several instances, we heard from BT that neither housebuilders nor planning authorities liaised with them during the planning stage. Given that homes are covered by the Universal Service Obligation for basic telephony and internet access, we were not satisfied with this explanation. While we recognise the progress that the Minister has made personally, we consider there may be scope for the provision of new statutory planning guidance for new developments for broadband installation given it is now viewed as an essential utility.

**29. The progress made since 2010 in providing superfast broadband access has on balance demonstrated that the Government was right to go with the BDUK scheme which principally involved BT and deployment of its fibre-to-the-cabinet solution. The Minister was adamant that this decision was key to the programme's rapid rollout. Without doubt, the alternatives would have been unaffordable in 2010 and would have taken very much longer to deploy. Clearly there has been a trade-off between competition, comprehensive coverage, speeds, costs and future proofing the network. Notwithstanding the problems and criticisms, BT and the local bodies are to be congratulated on reaching the 90 per cent coverage target.**

**30. The UK is currently doing well in comparison to similar EU countries on superfast broadband deployment: geographic coverage and take-up of superfast broadband in the UK are the highest of the five largest EU economies, while prices are among the lowest. In spite of this, the UK scores very lowly on fibre-to-the-premises deployment and there are growing concerns that an over-reliance on Openreach's copper access network, and its supposed lack of ambition for driving fibre to the premises across the country, could result in a hard-to-solve digital divide beyond 2020.**

**31. As the BDUK programme enters its next phase, it is important that lessons are learned from the performance so far. Given its importance to the future of connectivity in the UK, its significance in addressing market failure and the lively debate about progress with superfast broadband rollout, we were surprised that Ofcom has not yet provided any detailed analysis or verdict on how the BDUK programme has performed so far as part of its ten-yearly strategic Digital Communications Review. This was a significant omission on Ofcom's part.**

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<sup>46</sup> A critical factor in some providers' business models is that they typically rely on a 50% or 60% take up in order to get payback on their investment.

32. **An unmistakable downside of the BDUK programme was the lack of transparency in BT's costs and deployment plans, the apparent effect of which has been to stifle competition and thwart other network providers' planning. It is clearly unacceptable that BT has been allowed to get away with using such commercial secrecy in Government contracts when it may potentially have been the recipient of some £1.5bn of public funds to expand its own network base. Whether by accident or design, this has had the effect of reducing transparency and increasing uncertainty. Many households and businesses have been forced to hang on indefinitely to find out whether they would be covered, while competing network providers have been discouraged from making investments and capital commitments.**

33. **One consequence of BDUK's and BT's rapid rollout is that the programme appears to have tackled the easier-to-reach premises first and has not delivered coverage to whole areas as such. This has left a patchwork of premises that have not been reached, and much uncertainty among local residents as to whether or not they will be connected or receive improved speeds and in turn has been compounded by repeated failure by BT to give accurate information on timing of deployment to consumers. Many counted as covered still appear unlikely to receive superfast speeds owing to the poor quality or length of the copper lines. It is yet to be shown whether and how far BT's development of new technologies such as 'Long Reach VDSL' will improve the situation for those at some distance from a cabinet.**

34. **Given the nature of the deployment, it is now absolutely essential that BT publishes full broadband speeds and coverage at a premises level, giving full transparency of those who are and who are not receiving superfast speeds so that other providers can, if needed, step in to pick up gaps in coverage. In its current negotiations with BT over the future of Openreach, Ofcom must insist on publication of this data, at the very least, for those BDUK intervention areas which have been covered using public money.**

### Connectivity for small businesses

35. Households seem to have been the primary focus of the BDUK rollout, but we consider it is vitally important that small and medium-sized enterprises' (SMEs) needs are also sufficiently met, particularly given that SMEs are likely to offer the biggest productivity and economic benefits. Several witnesses have highlighted the fact that business parks have often been missed out by BT's own superfast commercial programme.<sup>47</sup> It is unclear how far this reflects accidents of the rollout, and how far the commercial priorities of BT. In either case, the present system is unacceptable. Businesses often may already be using relatively expensive dedicated leased lines and so there is a motive for the supplier not to make more generic provision available to surrounding businesses, even though FTTC may be an ideal and cheaper solution. This may be a powerful reason why these business parks appear to have been bypassed.

36. There remains a serious problem in reaching small businesses in cities and towns. For example, while the City of Westminster is deemed commercially viable under State Aid

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47 West Yorkshire Combined Authority ([EWC0103](#)); British Chamber of Commerce ([EWC0091](#)); TalkTalk ([EWC0056](#)); TalkTalk ([EWC0056](#)); and Tees Valley Unlimited ([EWC0011](#)).

considerations for superfast broadband, we were told that the four telephone exchanges that serve its most densely populated business areas have not been upgraded by Openreach. Together they serve up to 58% of the 20,000 business in Westminster.<sup>48</sup>

37. Openreach told us that it is developing a new Fibre to the Premises (FTTP) product specifically for SMEs, offering ultrafast speeds of up to 1Gbps.<sup>49</sup> The rollout is part of a wider plan to make ultrafast broadband available via FTTP and G.fast technology to up to one million businesses by the end of 2020.<sup>50</sup> The first areas to be covered will include parts of Bath, Bradford, Bristol, Liverpool, Manchester and Salford, as well as Westminster, Holborn and the City of London. Openreach has said the new FTTP product will provide an alternative for SMEs to expensive leased lines. The expansion of the FTTP footprint could also eventually benefit adjacent residential homes in the targeted areas.

**38. It is essential that the Government and Ofcom ensure that SMEs have access to reliable and affordable broadband and are not discriminated against by providers. The Government must prioritise delivering superfast broadband to new and existing business parks and fully connect enterprise zones, many of which still do not have superfast connections. The present system is not working for many businesses and we are concerned that BT is being perversely incentivised not to invest in FTTP in business parks by its present revenue income from dedicated lease lines.**

39. As part of a Super-Connected Cities programme the Government invested £150m to support selected UK cities in the development of their digital infrastructure. As part of the programme, businesses were able to benefit from broadband connection vouchers in 22 cities across the UK. The BDUK scheme granted vouchers of up to £3,000 to cover the cost of small business installing faster and better broadband. The voucher scheme proved very popular where coordination and aggregation of eligible recipients was possible. In 2015, following an extension of the coverage to the counties around the cities where vouchers could be used, there was a surge in demand. In the end, over 50,000 businesses across the UK qualified for a voucher.<sup>51</sup>

40. However, whilst many businesses were in the process of getting together to pool demand for a voucher application, the scheme was suddenly frozen without notice in October 2015.<sup>52</sup> In response to our query, Ed Vaizey explained that when the Chancellor announced a widening of the scheme in 2014, it had been made clear that it would be available to SMEs from April 2015 on a first come, first served basis and it had always been the case that it would close when the money was fully allocated. He pointed out that demand for vouchers had grown rapidly over 2015, and following a huge hike in demand last autumn, BDUK had acted quickly to close the scheme to new applications in order to protect public funds and make sure the Government could honour the thousands of vouchers issued. The Minister told us that he remained a fan of the scheme and wished to revive it but this was unlikely to be supported by the Treasury:

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48 Westminster City Council ([EWC0104](#))

49 Q758

50 G.fast is a digital subscriber line (DSL) standard for local loops shorter than 500m, with performance targets between 150 Mbps and 1 Gbps, depending on loop length.

51 Department for Culture, Media and Sport ([EWC0121](#))

52 Q11

I have lobbied the Treasury very strongly to revive the scheme. The Treasury regards the scheme as a sunk cost because they think that people who take advantage of the voucher would buy broadband anyway, and I disagree with them on that. I think what the voucher scheme did was it took businesses over the hurdle of quite a high headline figure, potentially, of getting a business broadband connection, £2,000 to £3,000.<sup>53</sup>

41. Others, however, took a different view. the Super-Connected Cities Programme by definition failed clearly to include many cities in the scheme and the extension of eligibility for vouchers to counties around the cities selected was inadequately publicised. Dido Harding, chief executive of TalkTalk, told us that there were better ways to spend Government money:

If someone wants to do a promotion for my customers it is hard to say no, but as a customer and as a taxpayer I would rather see that subsidy go direct into driving investment in areas where currently it is not commercially viable for any of the competing networks to build than to think that the demand-pull on an investment business case that is maybe 10 to 20 years is going to drive those investment decisions.<sup>54</sup>

**42. The broadband connection voucher scheme appears to have been very successful in pooling demand and facilitating better connectivity for SMEs. We share the Minister’s enthusiasm for an extension of the scheme and see a strong case for further vouchers to support those businesses in areas not likely to be reached by superfast broadband or affordable commercial products, such as the many small businesses in remote rural areas in the “final 5%”. We regret the ending of the scheme without due notice. This should not be repeated.**

## Connectivity in the devolved Nations

43. Overall progress in delivering superfast broadband has gone well in the three devolved Nations. Coverage levels are slightly behind that in England, but this is largely due to the higher proportion of rural terrain and more challenging topography in each nation. BDUK is responsible for managing the Government’s broadband funding, while the individual programmes are the responsibility of the respective devolved administrations.

Superfast broadband coverage by Nation as at end of March 2016	
Percentage of premises covered	
England	90%
Northern Ireland	83%
Scotland	83%
Wales	86%

Source: Based on data produced by BDUK.

53 Q1060

54 Q386

## Northern Ireland

44. Northern Ireland has some of the most challenging issues in the UK when it comes to deploying telecoms infrastructure with a widely dispersed population largely living in rural areas. It had a good head-start in next generation coverage, given early intervention there through European structural funding which has supported BT's deployment of FTTC and other initiatives. Since 2004, the Northern Ireland Executive has been working with the EU Commission, the UK Government and BT to deliver a number of initiatives to improve its communications infrastructure. By the end of 2015, £64m of public money had been invested in these initiatives.<sup>55</sup> The Executive explained that the collaborative projects taken forward in Northern Ireland had levied substantial industry match funding. However, as the intervention area for recent projects has targeted the most rural and more expensive to reach areas, the level of supplier funding provided has substantially reduced.<sup>56</sup> While this is understandable from a commercial perspective, the Executive wants the communications industry to be challenged to consider their social responsibilities and look beyond commercial issues when tendering for government contracts. Accordingly, they foresee that subsidy-only funding models are no longer likely to be a viable option.

## Scotland

45. In the Scottish Government's experience, the broadband programme has been positive. This was largely because budgets, and responsibility for delivery, were devolved.<sup>57</sup> The Scottish Government considers that more public investment will be needed in future to provide for those not yet reached. They see Ofcom continuing to have a key role to play in assessing whether the regulated players, notably BT, were investing an acceptable amount of their own resources in upgrading and extending telecoms infrastructure. They pointed to other sectors, such as energy, water and rail, where there is more transparency around planned infrastructure investment and the regulators are more prominent in overseeing delivery.

## Wales

46. Superfast Cymru is the Welsh Government's delivery body for its superfast broadband programme. The Superfast Cymru project is bringing superfast broadband access to premises in Wales where it was not commercially viable to do so, estimated at around 727,000 premises.<sup>58</sup> In July 2012, the Welsh Government signed an agreement with BT Openreach for the provision of access to superfast broadband infrastructure for 95% (691,000) of the premises in the intervention area. In May 2015, the Wales Audit Office reported that the Welsh Government's Superfast Cymru contract was "making reasonable progress" in rolling out access to superfast broadband services. However, as can be seen in the coverage map above, two of the counties in mid-Wales, Ceredigion and Powys, have among the lowest superfast coverage of any regions in the UK.<sup>59</sup>

55 As part of Phase 1 of the superfast broadband programme, Northern Ireland was allocated £4.4m through BDUK, and under Phase 2, BDUK allocated a further £7.2m. The £7.2m was set to be matched by the NI Executive and BT has agreed to commit £3m to the project.

56 Jonathan Bell MLA, Minister, Department of Enterprise, Trade and Investment, Northern Ireland Executive ([EWC0082](#)).

57 Scottish Government ([EWC0023](#))

58 Wales Audit Office, "Welsh Government investment in next generation broadband infrastructure", 28 May 2015.

59 See Frank Bott et al ([EWC0007](#))

47. It was an important step to devolve operational responsibility for improving connectivity to the devolved administrations. They have all made good progress despite their more rural and challenging geographies. All three nations have experienced similar challenges and appear to share a recognition of the imperative to drive more investment from the private sector into the UK's telecoms infrastructure. It will be important that DCMS and Ofcom fully involve the devolved administrations in future policy making and the design of future interventions for broadband and mobile, given that a one-sized approach is unlikely to work for all.

## Mobile coverage

48. The four primary UK Mobile Network Operators (MNOs)<sup>60</sup> are investing in their networks to expand coverage and capability. In December 2014, following a threat by the then Secretary of State, Rt Hon Sajid Javid, to legislate to introduce national roaming to improve mobile coverage, the Government agreed a new deal with MNOs for voice coverage. Under the agreement all four of the MNOs collectively agreed to:

- a guaranteed £5bn investment programme to improve mobile infrastructure by 2017;
- guaranteed voice and text coverage from each operator across 90 per cent of the UK geographic area by 2017, halving the areas currently affected by patchy coverage as a result of partial “not-spots”;
- increase full coverage from all four mobile operators from 69 per cent to 85 per cent of geographic areas by 2017;
- provide reliable signal strength for voice for each type of mobile service whether 2G, 3G or 4G;<sup>61</sup> and
- make the deal legally binding by accepting amended licence conditions to reflect the agreement.<sup>62</sup>

There is also a licence obligation on O2 (following the 2013 4G auction) to deliver indoor 4G coverage to 98% of UK premises (95% in devolved administrations) by 2017. This should significantly improve data coverage for UK households. It is encouraging that the other MNOs have indicated that they will match O2's coverage. In addition, EE has been selected by the Home Office to provide the Emergency Services with a national mobile network, giving 300,000 critical emergency workers access to 4G voice and data for the first time.<sup>63</sup> EE will no doubt benefit from the synergies that should be possible from its deployment of this £1bn Government contract but so too should mobile coverage.

60 The four primary MNOs are EE, O2, Three UK and Vodafone. In January 2016, BT acquired EE for £12.5bn after the Competition and Markets Authority gave its clearance for the acquisition.

61 Currently many people frequently lose signal or cannot get signal long enough to make a call.

62 It is enforceable by Ofcom.

63 'EE selected to deliver critical new 4G voice and data network for Britain's Emergency Services', EE Press Release, 10 December 2015.



Summary of outdoor mobile coverage from all operators in the UK in 2015			
Percentage of premises covered			
Technology	2G	3G	4G
England	94	91	50
Northern Ireland	83	73	0
Scotland	90	79	37
Wales	84	73	0
Whole of UK	93	88	46

Source: Ofcom's Connected Nations Report, 1 December 2015

49. While the £5bn headline figure appears impressive, the Ofcom Advisory Committee for Scotland (ACS) has noted a widely held view that it simply amounted to a re-statement of previous investment intent by the MNOs.<sup>64</sup> ACS argues that the deal negotiated to provide 90% coverage could have a negative impact on the “last 5%” in Scotland. The deal could help resolve partial “not-spots”, rather than improving the situation for complete “not-spots” in very rural areas.

50. It is widely recognised that the DCMS sponsored Mobile Infrastructure Project (“MIP”) failed. Under this the Government had intended to invest up to £150m in mobile infrastructure to improve coverage for voice calls and text messages for the final 0.3–0.4% of UK premises that did not currently have it.<sup>65</sup> The project had been expected to deliver several hundred masts, but there has been little progress since 2013. The reasons cited include a long delay in getting State Aid clearance, planning problems, lack of access to power and backhaul<sup>66</sup> connections in rural areas, difficulties in locating suitable sites, and probably most of all the fact that the State Aid rules had stipulated that all four MNOs had to be connected to all MIP masts. In addition, network operators are left in a position of having to cover all the higher ongoing operating costs associated with running and maintaining remote masts where they might never see a return on their investment. As a result, very few masts have been built. The Minister told us that MIP had got 75 masts into rural areas which had provided coverage for about 8,000 premises and that he would like to see if BDUK could potentially get a further 10 to 30 masts built but that would depend on whether the Treasury had an appetite to subsidise the capital costs.<sup>67</sup> Industry representatives also recognised a case for further public support for tackling mobile “not-spots”.<sup>68</sup>

51. As highlighted by the DCMS when it considered mobile coverage in late 2014, partial “not-spots” affected 3% of UK premises, 10% of A roads, 16% of B roads and 21% of the UK's landmass.<sup>69</sup> These figures have a disproportionately high impact in rural areas and can give rise to serious safety issues.<sup>70</sup> Several witnesses supported full or limited roaming

64 Ofcom Advisory Committee for Scotland (the ACS) ([EWC0012](#))

65 Under MIP the DCMS funded both the sites constructed by Arqiva and the radio and transmission equipment used by the MNOs.

66 In a telecommunications network the backhaul portion of the network comprises the intermediate links between the core network and access network, mast or base stations.

67 Q1139

68 Q433 [Wireless Infrastructure Group]

69 DCMS: Tackling Partial Not-Spots in Mobile Phone Coverage: Government Response to Consultation.

70 The RAC Foundation found that just under 4,600 miles of the UK's roads lack any 2G coverage, with almost 29,000 more enjoying only partial cover, meaning only drivers who are with certain networks can get a signal and call for help.

agreements for rural areas, as one practical way to get at least a basic voice service working in remote and rural locations, where neither private sector investment nor public sector intervention has generated much success. Yet it was generally recognised that there would be significant network engineering and commercial interest hurdles to cross.<sup>71</sup> The MNOs see rural roaming as a disincentive to investment in rural areas. An alternative approach which could improve coverage is for more sharing of masts between the MNOs in rural areas where access to backhaul to the different networks allowed this.

52. Ofcom is now preparing to auction additional spectrum which is likely to be used by mobile operators to improve rural mobile data capacity. The 700 MHz band is currently used for digital terrestrial television but is expected to become available for mobile broadband use from 2022 or possibly sooner.

## A new Electronic Communications Code

53. The Electronic Communications Code governs the rights of network providers to install and maintain infrastructure on public and private land. There has been broad agreement for several years that the Code is in need of reform. The DCMS asked the Law Commission to review it in December 2011 and in February 2013 the Commission issued a report making recommendations for a revised Code. In January 2015, the Government tabled an amendment to the then Infrastructure Bill substantially based on the Law Commission's recommendations but then withdrew it. The Minister told us that Vodafone had in effect told DCMS that it was the "wrong solution".<sup>72</sup> A new draft Code is being included in the Digital Economy Bill this summer.<sup>73</sup>

54. The new Code has been drafted to put digital communications infrastructure in a similar regime to utilities like electricity and water.<sup>74</sup> For example, it will provide an automatic right to allow operators to upgrade and share apparatus without prior agreement or payment to landowners where there is minimal adverse visual impact, as recommended by the Law Commission. The Government is also proposing to change the land valuation of the rent system based on compulsory purchase principles as for other utilities.<sup>75</sup> At present, Vodafone told us the cost that it paid in rent for a mobile site was more than 20 times what a water or energy utility would pay for the same size of plot and usage.<sup>76</sup>

55. The new Code will allow disputes to be heard in a tribunal system rather than the more expensive and lengthy process of going through the courts.<sup>77</sup> Nonetheless, the Wireless Infrastructure Group emphasised the importance of a new Code not losing the voluntary support of the land sector for supporting telecoms infrastructure deployment:

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71 Ofcom Advisory Committee for Scotland (the ACS) ([EWC0012](#)); Jonathan Hines, Managing Director of Architype ([EWC0093](#)); The Communications Consumer Panel (the Panel) and the Advisory Committee on Older and Disabled People ([EWC0088](#)); Welsh Government ([EWC0077](#)); and Federation of Communication Services ([EWC0037](#)).

72 Q1144

73 The Digital Economy Bill was announced in the Queen's Speech on 18 May 2016 and introduced in the House of Commons on 5 July 2016.

74 A New Electronic Communications Code, DCMS, 17 May 2016.

75 This means the value of the land will be assessed on its value to the landowner, not on its value to the network operator as it is currently.

76 Q99 [Vodafone]

77 The Law Commission recommended that the disputes be referred to the Land Chamber of the Upper Tribunal rather than the current range of bodies that deal with disputes.

In many ways, like other utilities—[communication providers’] services are as important as water and power—but we are not like other utilities in terms of the job that is ahead of us. We have years and years of network building ahead of us, and the voluntary support of the land sector is absolutely crucial to that. If we lose that, we might as well all go home for the next four or five years ...<sup>78</sup>

56. Planning policy also requires rapid reform to enable the industry more easily to provide the infrastructure required to give better coverage. O2 were encouraged that the Government were considering the extension of permitted development rights to taller mobile masts in England. Temporary amendments were made to the existing Code in 2013 as part of the Growth and Infrastructure Act to promote economic growth by speeding up the deployment of broadband infrastructure.

57. **The Government and Ofcom have worked well together to secure investment from the mobile network operators to achieve agreement on reaching a 90% geographical coverage by 2017. Ofcom has successfully designed spectrum auctions so that coverage obligations are a key part of these exercises. The Government will undoubtedly achieve better coverage for mobile through the release of 700 MHz band and others once they become available. When these bands are auctioned there will clearly be a trade-off between spectrum price and the obligations on the licence holders. To facilitate investment by the operators, the Government may well need to place additional emphasis on achieving coverage, and on the role that mobile will play in meeting the universal service obligation for broadband, rather than primarily maximising revenue from the auction.**

58. **Given the progress being made and the undertakings agreed by the mobile network operators in 2014, the Government should, as it has acknowledged, continue cutting red tape, reform the Electronic Communications Code and take further steps to provide a conducive environment to investment, and easy access to fairly-priced backhaul connectivity.**

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78 Q447 [Wireless Infrastructure Group]

### 3 Reaching the final five per cent

59. As coverage maps show, the final premises with the poorest broadband services are scattered throughout the UK. While a greater proportion of these will be in rural areas, a significant number are also likely to be homes categorised as being in a commercial zone at the edges of towns or in suburbs. With little or no commercial incentive to connect them, these properties can find themselves left in limbo.<sup>79</sup> Under the existing State Aid rules, postcodes can be ineligible for BDUK coverage if even a single home receives a superfast service.<sup>80</sup> There are also a number of gaps on the periphery of BDUK contract areas, particularly between neighbouring counties.<sup>81</sup>

60. Last November Ofcom found that even where the local infrastructure had been upgraded, for technical reasons associated with longer copper lines, many premises could not receive superfast speeds.<sup>82</sup> This is a problem that BT suggests could be solved by its development of long-reach VDSL technology.<sup>83</sup> Others receive poor connections due to the dilapidation and poor state of repair of their local access network.<sup>84</sup> Around 2 million (or 7% of) UK premises are connected to upgraded networks but still cannot receive superfast download speeds; on average download speeds are around 18Mbps.<sup>85</sup>

61. It is possible to improve coverage in the final 5% with a range of existing technologies, including fibre to the premises or fibre to a remote node, satellite, fixed wireless and 4G. However, given the location of some these premises, certain solutions are likely to be prohibitively costly, either for the supplier, the consumer or both. In addition, depending on the technology chosen, the quality of service will vary, in terms of speed, capacity and reliability. So far BDUK's pilots trialling alternative delivery models have found that a 'hybrid' technology approach, particularly using fibre with wireless, has proved effective in remoter areas, delivering high coverage while demanding relatively low public subsidy.<sup>86</sup>

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79 See: Mrs Anne Tutt ([EWC0095](#))

80 For example, if a postcode contains 100 premises and only three of these have access to Virgin broadband, then the whole postcode is deemed as ineligible for intervention funding. Consequently the other 97 premises lose out.

81 Nottinghamshire County Council ([EWC0049](#))

82 Ofcom state that the distance between the premises and the exchange has an impact on the quality of service received. The resistance of copper wire increases with the length of the wire, so speeds decay as the distance between the premises and the exchange increases. Speeds typically start to decrease between 1 and 2km from the exchange and are reduced considerably at distances of more than 3.5km.

83 Long Reach VDSL operates at higher power levels and utilises additional frequencies in order to increase broadband speeds and the distance over which they can be delivered. This means it could have the potential to boost broadband speeds over long copper lines, such as those that are often found in remote parts of the UK. (see BT([EWC0116](#))).

84 Q597 [William Perrin]

85 Connected Nations Report 2015, Ofcom, para 4.11

86 All of the BDUK pilots are operating in the 2% lowest premises density areas of the UK.

### Alternative technologies

**4G mobile.** The mobile network operators are rolling out 4G networks which can provide broadband services: speed and service are subject to the demand on backhaul transmitters and/or and local cells.

**Fixed wireless access.** Fixed wireless has the advantages of low cost-of-entry and flexibility. Options range from conventional Wi-Fi and WiMAX, based on free spectrum through the use of 4G technologies and “white space” spectrum.

**Satellite.** The latest solutions appear to offer superfast speeds of over 30Mbps for downloading, but there are capacity and latency (delay) constraints and data caps can make a service expensive. Given the physics of a satellite being 30 thousand miles away, this option works less well for two-way services such as voice services, video-conferencing and gaming.

## Alternative technologies

62. In December 2015, the Government launched a new satellite broadband subsidy scheme, which aims to help 300,000 of the most remote rural premises to get a better connection. The scheme offers individual grants of up to £350 that can be used to reduce the initial satellite cost as a quick-fix solution for meeting the Government’s 2Mbps universal service commitment. Developments in fixed-wireless can also provide higher access speeds in certain locations. It is encouraging that the Government decided to widen its subsidised scheme to cover wireless solutions too.<sup>87</sup>

63. In addition, the mobile network operators are using 4G to connect rural communities. Vodafone told us it is supporting a community-led programme that delivers mobile voice and internet coverage to rural communities who have fixed broadband (not necessarily superfast), but no mobile signal.<sup>88</sup> The technology employed enables calls to be made via a broadband line with connection speeds of more than 4Mbps.

64. Nevertheless, there are questions over the suitability of satellite broadband for some households. We heard several concerns about the impact of the relatively low data caps in tariffs for satellite broadband and the expense of exceeding those caps.<sup>89</sup> For instance, regular downloads of high definition television can quickly use up a limited allowance. There were also significant concerns about the impact of time delays caused by two-way communication to a geostationary satellite. This causes problems for those using video-conferencing services such as Skype or for computer gamers. However, David Williams of Avanti Communications,<sup>90</sup> argued vigorously against the idea that a significant percentage of satellite broadband customers experience real problems with time delays. He argued that the only major challenge facing satellite and other alternative technology solutions was the lack of public awareness of their availability.<sup>91</sup>

**65. We consider that there is an important, but limited, role for satellite provision in meeting the overall challenge of delivering affordable broadband services. Satellite providers are particularly relevant for extreme rural provision, which might incur**

87 See: ‘Fear not Telegraph readers—faster broadband is coming’, The Telegraph, 16 May 2016.

88 Vodafone ([EWC0065](#))

89 Typically 30GB a month on a £44.95 BDUK tariff for 15Mbps download and 2Mbps upload.

90 Avanti Communications Group uses Ka Band services available from its Hylas satellites.

91 Avanti Communications Group ([EWC0052](#))

**supplementary costs beyond a potential standard USO tariff structure. They are also relevant for expedient provision to bridge a gap until terrestrial services gradually extend through to most of the premises as yet beyond the BDUK roll out.**

## Support for local communities

66. During our visit to the Chilterns, we experienced at first hand the very high levels of frustration experienced by the “final five per cent”. Clearly it is important, especially in the context of a potentially legally binding USO, to address this deficit. Reaching these areas with, for example, fibre to the premise is likely to be a very lengthy and costly task, but we heard cogent arguments for the deployment of potentially interim technologies, for example Fixed Wireless Access or Cells on Wheels<sup>92</sup>, to bridge the gap to longer-term, more sustainable solutions. By their nature, stop-gap systems must be replaced in the longer term, and especially with the inevitable rise in speed demands.

67. We heard excellent examples from local groups and rural businesses which aimed to bring local resources, such as farmers’ diggers and access to land wayleaves, to bear on minimising the cost of both fibre and radio provision.<sup>93</sup> The success stories of community initiatives such as the B4RN fibre network in rural Lancashire and Cybermoor in Cumbria are relatively well known.<sup>94</sup> Communities can play a valuable role in securing and extending superfast broadband, especially in their ability to stimulate demand and to reduce costs through undertaking some of the engineering work themselves.

68. William Perrin, Director of Talk about Local,<sup>95</sup> based in the Chilterns, told us that people needed better advice on their options for broadband campaigns. If a premises is off the gas mains or the sewerage network, he pointed out, then there is typically plenty of information available about consumer options, but not for broadband. To help provide support in Scotland, the Community Broadband Scotland service offers a small network of advisers who work with broadband community campaigns across the Highlands and Islands to help connect them with technology providers and finance. It is an initiative which supports communities in those areas least likely to benefit in the current 95% coverage programme.<sup>96</sup>

69. Mr Perrin told us there was a demand for this kind of service to be replicated at a county or regional level in England, perhaps through BDUK, as an efficient way of sharing expertise. **Clearly, in supporting community action in the final five per cent, Government and local authorities will need to consider how best to advertise available solutions to those with poor connectivity.**

70. **The challenge of reaching the final five per cent is likely to demand the active and willing co-operation of local communities wherever possible. BDUK should offer guidance and support in relation to key areas such as: choosing the right technology solutions, raising finance, stimulating demand and minimising other costs of provision.**

92 A ‘Cell on Wheels’ is a portable mobile cellular site that provides temporary network and wireless coverage to locations where cellular coverage is minimal or other technologies are difficult to deploy.

93 Jonathan Hines, Managing Director of Architype ([EWC0093](#))

94 See Independent Networks Co-operative Association ([EWC0001](#)), Virgin Media ([EWC0064](#)); and Q1002

95 William Perrin is also the co-founder of Connect8, a local campaign group for better broadband in the Chilterns.

96 Ofcom Advisory Committee for Scotland ([EWC0012](#))

### **Providing access to backhaul**

71. For non-satellite projects, suitable backhaul<sup>97</sup> remains a costly problem. Ofcom has announced that it will require BT to provide access to its fibre network for providers from next year. This will mean that BT will have to give competitors physical access to its ‘unlit’ fibre-optic cables, allowing them to take direct control of the connection.<sup>98</sup> This will no doubt help provide backhaul for both alternative network providers and also mobile network operators.<sup>99</sup> Some gaps will inevitably need to be filled by other network operators such as Level 3, Virgin Media and Vodafone. To assist with possible deployments, a potential role for Ofcom could be to oversee the mapping of national availability of fibre and infrastructure together with a schedule of rates. This should also cover spare capacity in public-owned fibre and infrastructure assets such as masts, for example those owned by police forces, Network Rail and the MoD.

72. Developments such as fibre to a remote node and micro-trenching are likely to be transformational for rural areas.<sup>100</sup> In particular, a remote node<sup>101</sup> can bring fibre closer to a village or cluster of premises, which can help greatly. Such deployment can provide superfast broadband to premises that are too far from existing cabinets, and to those connected directly to an exchange. Inevitably it will be the case that some premises at a distance from backhaul will face high costs to reach an access point to a network.

**73. Opportunities for the rollout of fibre to remote nodes should be fully investigated by Ofcom as part of an overall solution for rural connectivity. Access to affordable, reliable backhaul allows communities to benefit from alternative solutions and gives them opportunity to build their own networks such as with B4RN in Lancashire. To assist with deployments, Ofcom should have an important role in overseeing the mapping of national availability of fibre together with a schedule of rates, including suitable spare capacity of public-owned assets.**

### **Further public subsidy?**

74. Estimating the cost of providing superfast connectivity to the final five per cent depends on where these areas are and the technologies and business models employed. Gavin Patterson, BT’s chief executive, told us the last five per cent could cost up to £2bn to deliver depending on what the Government decides to do.<sup>102</sup> According to BT, there was no evidence to suggest that a lack of financial capital restrained network deployment but a standalone investment of that magnitude would be unlikely to make a commercial return.<sup>103</sup>

75. There was broad agreement on the need for further public interventions in reaching the final five per cent.<sup>104</sup> Nearly all witnesses representing industry supported assistance provided neutrally: through debt-financing and loan guarantees, demand-side

97 In a telecommunications network the backhaul portion of the network comprises the intermediate links between the core network and access network, mast or base stations.

98 This service is often referred to as ‘dark fibre’, because the cables would not be live.

99 See Ofcom’s Business Connectivity Market Review, 22 March 2016.

100 Micro-trenching has the potential to reduce costs significantly in some deployments but it is not a technique universally accepted by local authorities.

101 A remote node can act as a village digital hub.

102 Q785 [Gavin Patterson]

103 BT ([EWC0063](#))

104 Broadband Stakeholder Group ([EWC0092](#))

interventions such as publicly-funded connection vouchers, and cost reduction measures, rather than via more public subsidies going to Openreach.<sup>105</sup> According to the Minister, a new universal service obligation (USO) would be the “final chapter” in broadband rollout.<sup>106</sup> However, some campaigners have read this as a sign that the Government is giving up on providing people in the countryside with a fast internet connection.<sup>107</sup> We consider the case for a USO below.<sup>108</sup>

76. Virgin Media was a lone voice in calling for an immediate halt to the public funding of the BDUK scheme.<sup>109</sup> According to Tom Mockridge, Virgin Media’s chief executive, it was not necessary for state funding to be focusing on this 95% “upgrade”. Virgin considered that if public money is necessary to reach the final parts of the UK where commercially-led deployment does not materialise, it should be spent on raising demand or providing satellite equipment.<sup>110</sup> However, Dido Harding, TalkTalk’s chief executive, argued that the harsh reality was that some form of state support would be needed for the hardest-to-reach areas.<sup>111</sup>

77. As discussed above, a key feature of the gap-funding model of the BDUK programme is the scope for local bodies to benefit from higher revenues due to higher broadband take-up and also underspend by Openreach.<sup>112</sup> The Minister indicated that BDUK was on course to claw back £250m.<sup>113</sup> Chris Townsend, BDUK’s CEO, was even more optimistic, anticipating a 50% take-up.<sup>114</sup>

78. In addition, BDUK estimates at least £150m of underspend will be retrieved from the Phase 1 procurement and made available to local authorities for reinvestment. This, in conjunction with the refund to local authorities, will enable many more premises in the final five per cent to be covered. We understand that local bodies are not obliged to reinvest the money gained from higher take-up with Openreach, but can choose to use other providers and different solutions to BT’s FTTC technology.

**79. A positive feature of the BDUK gap-funding model is that local bodies receive a refund from BT where there is higher-than-forecast take-up of superfast broadband services. It remains questionable whether the original 20% take-up rate set in these contracts was too low, but the money available for reinvestment will mean that a significant further percentage of premises will be covered beyond the 95 per cent target. Local bodies must be entirely free to choose how to reinvest this money and to spend it with alternative providers other than BT Openreach, if they consider that as being a more appropriate and cost-effective option.**

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105 See: Q155 [Vodafone and Sky]

106 Q1053

107 ‘Ministers halt automatic broadband roll-out for rural families because ‘not everyone wants to be connected’’, The Telegraph, 5 May 2016.

108 See chapter 4 below.

109 Q353

110 Virgin Media commissioned a report that claims the programme’s “conservative” assumptions on demand and timeframe set for a “clawback” of excess revenues could lead to a windfall of £320m - £869m for BT over a 20-year period, depending on the extent of take up.

111 Q352

112 See paras 16 and 23–24

113 Q1102

114 Q302 [Chris Townsend]



### Supporting start-ups

80. Smaller and alternative technology companies have argued that BT has on occasion moved, or appeared likely to move, into areas in which they have established networks blighting revenues before they are able to recover their costs. To address this problem, it was suggested that one approach might be to offer protections to network operators undertaking projects against being overbuilt by another provider or a publicly-subsidised scheme. For example, in hard-to-reach areas, where returns are more questionable, operators could be given licences to deliver that service for a guaranteed period where they were the sole provider so that they could recoup the investment they made in building networks in these challenging locations. Against this, Sharon White of Ofcom was quite clear that choice and competition were overriding principles in Ofcom's view, and she did not support restricting competition. She cited the case of the B4RN network in Lancashire:

Some of you will have seen the extraordinary chap in North Lancashire who, as the community put it, introduced 1 gigabit per second to a number of farm areas without BT in the first place, and then BT came in two or three years later. What is very interesting from talking to the community is there is choice and there is competition, and very few are switching from the community project to BT, just because the difference in speed availability is so vast. So I would be quite reluctant to say BT should be banned from going into areas where there is already a network running, because having competition and some tension in the system is a good thing.<sup>115</sup>

However, Ms White accepted that a tougher question was where publicly-subsidised deployments impacted on other commercially-funded infrastructure networks.<sup>116</sup>

81. As matters stand, where rural communities are united in their desire for reliable internet connections, and before a USO comes into play, then sufficient demand may need to be demonstrated for a network provider to be sure that there is a robust business case for investment. It would be difficult in practice to enforce rights of exclusivity given that some consumers may be more willing than others to pay for a higher specification, cheaper or more reliable service if it became available.

82. One possible option to stimulate demand would be the introduction of a Community Broadband Voucher scheme similar to the one used to promote the connection of businesses to broadband. This could be an effective mechanism to allow rural communities simple and appropriate access to funding which could in turn be used toward the cost of backhaul or contracting an alternative network provider. This could place the decision on how to employ the public contribution directly into the hands of the users who would benefit from better connectivity. **We agree with Government that a demand-led intervention for bringing connectivity to remote, rural communities is the right way forward for the "final five per cent". Given the challenge of stimulating demand and covering the costs of accessing backhaul will be a huge barrier to cross for some remote communities, we recommend that the Government evaluate the case for a rural voucher scheme to pool demand and contribute to the cost of backhaul access for network builders.**

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115 Q1002

116 Q1003

## Towns and cities

83. There is also market failure in city locations where commercial investment in existing infrastructure (to bring FTTC capability to city centre premises) is not taking place. City centre issues include a prevalence of exchange-only lines, costs associated with highways and traffic management issues, wayleaves and permissions from land and property owners. Clearly reform of the Electronic Communications Code and initiatives such as the introduction of standard wayleave templates by local authorities will be crucial to enabling better deployment of telecoms equipment in urban environments. Alternative providers that compete with Openreach and Virgin in towns and cities will benefit from the greater access to Openreach's ducts and poles that is planned. City Fibre, a wholesale infrastructure provider,<sup>117</sup> has already announced that it will use Openreach's ducts to lay fibre when they are opened up but has noted that the present regime did not facilitate this owing to prohibitive costs and hurdles.<sup>118</sup>

84. Local authorities and other public bodies can play an important role here. Many councils and housing associations own ducts and fibre for their own connectivity, CCTV and other networks. If these were opened up to third party providers it could transform the digital connectivity for citizens and businesses and generate very useful revenue to fund hard-pressed public services. Some local authorities are already going down this route, for example Hammersmith and Fulham Borough Council, which has opened up its fibre network to a concession agreement involving ITS Technology and Hyperoptic.<sup>119</sup> Under such partnership working, the commercial providers get access to an existing duct and fibre networks, so there is less cost and disruption, and the local authority gains revenue and helps get high-speed digital connectivity to many more local people.

85. In addition, in some city areas, networks have not been deployed due to anticipated low levels of demand, according to demographic or socio-economic indicators. There is also the issue of affordability. In areas of relative deprivation, there are higher proportions of mobile-only households where people cannot afford to spend £17 a month on a landline.<sup>120</sup> Therefore, in these areas, the commercial incentive to roll out fixed broadband infrastructure decreases owing to the low demand. **We consider probably the most effective way of providing access to broadband for those in urban or suburban environments where the market is currently not delivering access is through the introduction of a universal service obligation where a householder would have the legally enforceable right to an affordable and reliable internet connection.**

86. Probably the largest "not-spot" in the UK is the London Underground: it is the only one of the top ten metro systems in the world that does not have a mobile infrastructure.<sup>121</sup> While passengers are able to use wi-fi at Tube stations, there are challenges to providing connectivity throughout the Underground network.<sup>122</sup> Since 2005, Transport for London (TfL) has run a number of projects to investigate connectivity throughout the network but the cost of installation in a tunnel environment and other concerns make this a huge

117 CityFibre is a provider of wholesale fibre network infrastructure. It has metro duct and fibre networks in 37 cities across the UK and a national long distance network that connects these cities to major data-centres and to key points in London.

118 'CityFibre first to mount BT challenge after Openreach is told to share network', The Telegraph, 1 March 2016.

119 Independent Networks Co-operative Association ([EWCO001](#))

120 Q552 [West Yorkshire Combined Authority]

121 Q474 [Wireless Infrastructure Group]

122 TfL has partnered with Virgin Media to bring WiFi to 250 London Underground stations

undertaking. TfL are now investigating whether rollout could occur alongside the Home Office's upgrade of its national mobile communications system for the Emergency Services, which will include the Underground. In parallel, TfL is also assessing the feasibility of building the infrastructure with partners to enable MNOs to offer connectivity underground. This has been done successfully in a number of cities, including New York.

**87. Given that London is a world-class city and tourist destination, there must be an expectation now that its principal transport routes have full mobile and internet connectivity. The challenge of providing the London Underground network with connectivity is undoubtedly huge and expensive, but partnerships with private infrastructure groups may be able to facilitate a solution. A quid pro quo for any partner might be special access to the Underground's passive infrastructure running under London's streets, which could enable cost reductions and wider network development and upgrades across the Capital. There is also a vital need to improve mobile reception along principal rail routes.**

## 4 A right to broadband

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88. In November 2015, the former Prime Minister pledged that by 2020 everyone in the UK should have a legal right to access a broadband connection that downloads at 10Mbps, which he likened to other basic utilities such as light, heat and water.<sup>123</sup> Therefore the Government are proposing to introduce a universal service obligation (USO) to cover broadband.<sup>124</sup> In principle, this could give everyone a right to request a reliable broadband connection at a minimum of 10Mbps, and would be likely to make a huge difference to many homes and businesses. The Government will introduce an enabling power for a broadband USO in the Digital Economy Bill, which had its first reading on 5 July 2016.

89. The Government has said that ensuring rural communities and businesses can enjoy the benefits of faster broadband in the same way as their urban counterparts is critical to balancing the economy,<sup>125</sup> although, as we have highlighted, there are many premises in cities which will benefit under a USO. When we visited the Chilterns in February, many of those we met experienced internet speeds of around 0.5–1.0Mbps and had generally unreliable connections, where others had no connection at all. Many locals there struggled with those aspects of modern life that require online social and economic connectivity, such as shopping online, e-education and reliable email. In addition, the Government is vigorously encouraging people to use online public services. The DCMS has estimated that the number of households that will be unable to access a 10Mbps service by 2017 is likely to be as high as one million, with 100,000 of these in remote rural areas.<sup>126</sup>

90. A core justification for establishing a USO lies in the social and economic benefits it could deliver, such as cheaper and more efficient Government and public services, and the likely consequent productivity and growth to follow. For example, by 2020 digital services such as ‘tele-medicine’ are likely to be more prevalent—where patients monitor their own conditions through home-based or wearable devices connected to the internet, which could reduce the need for referrals to acute centres.<sup>127</sup> Clearly, broadband offers an opportunity to overcome geographical constraints by providing more services remotely. On the other hand, inadequate provision is a significant drag on the economy, inhibiting employment creation, limiting educational opportunities and reducing the quality of life for households in affected areas.

91. The consequences of being digitally excluded are almost certain to become more severe over time as more services expand online. Professor Helm, Professor of Energy Policy, University of Oxford, argued that in a modern functioning economy and democracy every citizen should be entitled to a certain bundle of social primary goods, of which broadband should now be considered one. As he explained, that was broadly the argument used for connecting people to the electricity system at a social cost and one used to justify universal postal services.<sup>128</sup> An economic argument is that, in the era of ‘digital-

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123 “Government plans to make sure no-one is left behind on broadband access”, 10 Downing Street, Press Release, 7 November 2015.

124 The current USO for telephony effectively allows every household to request a dial-up Internet access at 28.8Kbps. This is delivered through BT in nearly all of the UK and KCOM in Hull and the surrounding area. In 2009, the Government specified that every household should have broadband access of at least 2 Mbps. This is a state-funded commitment being delivered by BDUK.

125 A New Broadband Universal Service Obligation Consultation, DCMS, 23 March 2016.

126 Designing the broadband universal service obligation, Call for inputs, Ofcom, 7 April 2016, para 1.15.

127 Age UK ([EWC0042](#))

128 Q649

by-default' for public services and with commercial and social interactions increasingly taking place online, there are collective benefits to all users when everyone is connected to the network.<sup>129</sup>

92. The aim of a broadband USO would be for it in theory to capture 100% of premises. However, where the cost of provision is particularly high, for example in very remote areas, it seems the householder will be expected to contribute to the connection cost.<sup>130</sup> The specification of a USO for broadband would depend on a number of factors, including the required speed, cost, technical feasibility, affordability and possibly other service standard-type requirements. Its implementation would be demand-led, meaning whoever requested a connection should receive it.<sup>131</sup> This right would apply to all end-users at a fixed location, whether that be a residential or business address.

93. A USO will plainly impose a cost on the provider or providers who carry the obligation to deliver connections in unserved or underserved areas.<sup>132</sup> The current EU Universal Service Directive allows for two funding mechanisms where the delivery of a USO would be regarded to be an unfair burden on the designated providers: through compensation via public funds, and through sharing of costs between providers of electronic communications, i.e. through a levy. The Minister told us that a mixture of both was possible but the Government's preference is for the latter.<sup>133</sup>

### 10Mbps: too much or not enough?

94. In setting a minimum download speed, we heard a range of conflicting views ranging from the suggestion that just 2Mbps download is sufficient for access to government services, through to views that the European target of 30Mbps minimum download by 2020 may itself be inadequate.<sup>134</sup> Looking ahead to 2023, the Broadband Stakeholder Group (BSG) forecast a median household could require 19Mbps, with some users requiring 20–30Mbps.<sup>135</sup>

95. BDUK's market-testing pilots found that there is a general lack of knowledge among people about internet speeds and their practical capabilities. Evidence from the pilots suggests that when they are given a choice, people mostly prefer cheaper, slower packages; particularly if the package offered is 10Mbps. According to Ofcom, 10Mbps is required to meet the needs of a typical household—below this level, it found a household's use of data is constrained by its broadband connection, especially for households where several family members are often online at the same time.<sup>136</sup> Also more advanced applications,

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129 i.e. network externalities.

130 The current telephony USO sets a cost threshold of £3,400. For costs below this, the households pay a standard connection charge to BT, the Universal Service Provider for nearly all the UK, of £130. For the most expensive to connect premises, consumers have the option of covering any construction charges over this threshold.

131 A USO would mean that at least one provider must fulfil all reasonable requests to provide an affordable connection.

132 For instance, see KCOM Group plc ([EWC0094](#))

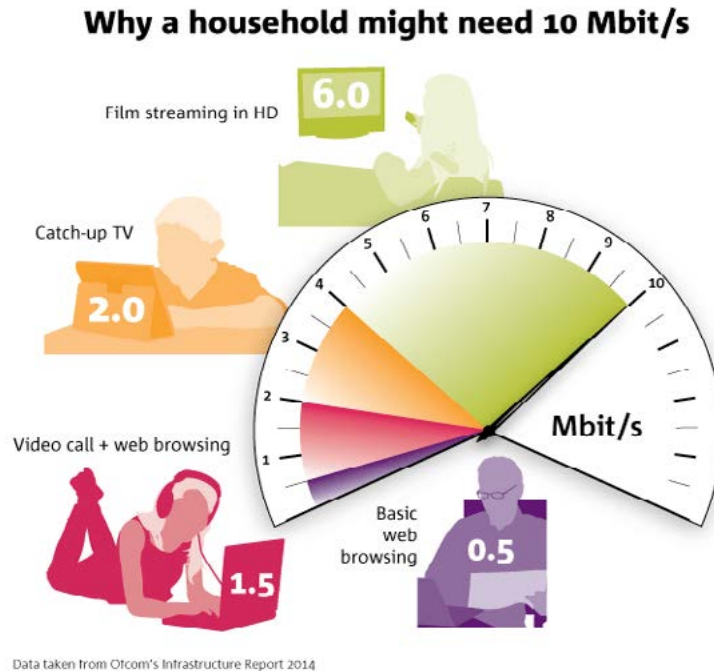
133 Q1051

134 See for example: Nottinghamshire County Council ([EWC0049](#)); Q581 [Broadband for Rural Devon and Somerset].

135 Qq3–6

136 Ofcom, Infrastructure Report 2013, p31.

demanding higher speeds, were becoming more commonplace. In addition to this, Ofcom's consumer research has found that consumers were more likely to rate their broadband experience as less than good at speeds below 10Mbps.<sup>137</sup>



96. In its written evidence BT disagreed with Ofcom, saying it was not convinced by its argument that a USO of 10Mbps was needed.<sup>138</sup> BT believes it is important to understand what constitutes a good broadband service for modern digital services, and what features other than speed may be important. In its “real-world” experience, various facts pointed towards 5Mbps being a better judged minimum, for example, hundreds of thousands of customers on lines of 5Mbps were content to continue using those lines, even when a superfast broadband line was available in their area.<sup>139</sup>

97. Putting this in context, BT explained that delivering a 10Mbps service would have a significant cost burden and would be substantially higher than any other definition of fixed line access in other EU member states. BT opposed a USO that would impose a unilateral cost on BT shareholders to fulfil a legal obligation, but said it stood ready to deliver a minimum standard broadband speed of between 5 and 10Mbps though this would be subject to Government and Ofcom taking action to make this commercially viable.<sup>140</sup> Towards the end of our inquiry, Gavin Patterson accepted that 10Mbps was probably around the right level for a USO.<sup>141</sup>

98. Similarly, a DCMS consultation found that there were concerns about the level at which the USO would be set if it led to higher broadband prices.<sup>142</sup> Virgin Media was

<sup>137</sup> Ofcom, *Making Communication work for everyone, Initial conclusions from the Strategic Review of Digital Communications*, p27.

<sup>138</sup> BT ([EWC0063](#))

<sup>139</sup> In March 2015, the Government announced an intention of setting a USO at 5Mbps. See: *The digital communications infrastructure strategy*, DCMS, 18 March 2015.

<sup>140</sup> BT ([EWC0063](#))

<sup>141</sup> Q788

<sup>142</sup> *New Broadband Universal Service Obligation consultation: Summary of responses and Government Response*, DCMS, 17 May 2016.

highly sceptical of the justification, believing a commercial market solution alone will be enough. It argued that having a gap between what is the average speed across the country and what is needed for basic broadband was “entirely appropriate”, since it should not be the purpose of a USO to enable all internet uses.<sup>143</sup> Instead, a USO should allow access to those uses that are likely to prevent digital exclusion. According to Virgin, the applications most relevant to enable societal and economic participation were workable at 3Mbps, or even lower. As such, Virgin argued that if a USO were to be mandated, then it should be funded by a universal service operator and be set at a level which delivered optimum network externalities at a minimum risk of crowding out commercial investment.

## SMEs and connectivity

99. As well as households having an entitlement to better connectivity, a USO would also need to support small businesses. Earlier this year, the Business Secretary, Rt Hon. Sajid Javid, announced a review of business broadband which among other things is looking at speeds that businesses need both now and in the future.<sup>144</sup> We considered therefore whether there was a case for the USO to set different speeds for domestic and business users.

100. Research conducted for the BSG has also found that while median downstream demand for small business premises would rise from 5Mbps in 2015 to 8.1Mbps in 2025, demand for the top five per cent would rise from 12.9Mbps to 41.1Mbps.<sup>145</sup> These download speeds are lower than BSG’s projections for a typical household.<sup>146</sup> The Federation of Small Businesses agrees with setting a USO at 10Mbps but says it should explicitly include businesses.<sup>147</sup> Upload speeds are also essential for some businesses and are more difficult to deliver using standard connections.<sup>148</sup> BSG found that over 50% of small business premises currently exceed the 1 Mbps upload capacity of ‘standard broadband’. It does not appear that anyone has looked at what households will need for upload speeds as more public services move online, but it may be that domestic uses will need an upload speed of at least 1 Mbps too.

**101. Rather than introducing two USOs, a single USO should be sufficient to accommodate the typical needs of both residential and small business users, which would facilitate home working. For those businesses that require above average speed connections, it is reasonable that they pay extra for these services, as they do for others such as business banking or other ancillary services. As a USO would be running principally on residential-grade infrastructure it could be complex to operate two fully specified USOs, one for home use and another for SMEs. Although some adjustments could be managed at an exchange level, which could make some differentiation possible, we expect in practice this would likely cause significant technical, operational and commercial challenges.**

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143 Virgin Media ([EWC0064](#))

144 Sajid Javid launches a review of business broadband at the EEF annual conference, BIS Press Release, 24 February 2016.

145 BSG Publishes New Model on Small Businesses’ Connectivity Requirements.

146 See para 94.

147 Federation of Small Businesses ([EWC0026](#))

148 Upload speed determines how quickly a person can send files, information and data to the internet. For example, when someone send pictures to another via a social networking site.

## Design of a USO

102. Under a USO, it will be important that Ofcom identifies logical, coherent areas for provision, assuming that it is not done on a national basis as it is for current fixed-line USO. The advantage of disaggregating provision is that different providers and technologies (or mix of technologies) are then able to serve particular areas. It is probable that not all areas will need a subsidised provider to any great degree, but rather those containing the harder-to-reach premises. There is also the question of how the size of each USO area should be determined. There is likely to be a trade-off between facilitating the emergence of the technology suitable for a particular environment versus economies of scope in providing for contiguous or close-by areas. Both would be considerations in the design of a competitive tender system. Dido Harding warned that the danger of a USO would be if it became subsumed into one company it would crowd out the technology competition that is needed to solve the problem of serving difficult-to-reach areas.<sup>149</sup>

103. Gigaclear's starting position was that in order to make efficient use of existing networks, any USO scheme ought to define service areas as being the smallest area to be served by any existing network operator. If no operator was willing to assume the USO undertaking (presumably under a competitive tender), then the scope of the area could be gradually expanded until an operator did apply. A USO could be introduced in a phased way, introducing it first into areas where no further commercial deployment was expected and leaving areas where deployment was expected to the last, i.e. 2020 or later, i.e. the reverse of the way the BDUK programme has operated.

104. Gigaclear also explained that the Government or Ofcom would have to require BT to undertake a full audit and mapping exercise to establish current broadband performance in order to determine the part of the market which needed to be addressed by a USO scheme, and then make this information available at an individual premises level to all potential bidders.<sup>150</sup> It is not yet clear, however, how this would work in practice. The holes in the current superfast provision would help determine these areas but BT and others will need to share information on coverage at a premises level and not hide data citing commercial confidentiality.

## Ownership of USO

105. There are a number of aspects to a USO which are less straightforward than in a 'traditional' utility industry with a monopoly provider. With a single provider the allocation of a USO is relatively uncomplicated: the monopoly provider is the universal service provider. Moreover, a uniform national price can be set to cover all parts of the country and the price level can be regulated so that it covers the average cost of provision; above the actual cost in some areas and below in others. However, the arrangement for a USO in today's UK broadband market is complex, as there is competition in provision in many areas and a choice of technologies to fulfil the obligation.

106. To be fully effective, the mechanism for allocating a universal service provider would have to be technology-neutral, and allow competitive tendering to determine the technology to be used in an area. This would be expected to include mobile (i.e. 4G and potentially 5G in the 2020s) as well as fixed-line and fixed-wireless providers. Sound,

<sup>149</sup> Q347 [Dido Harding]

<sup>150</sup> Gigaclear ([EWC0098](#))



credible providers with the most cost-effective solutions, in some cases offering a mixture of technologies, would be expected to be designated the USP. For a tender to work properly, there would also need to be enough competitors willing to bid, otherwise it would be a case of negotiating with the incumbent in the area and in most cases that would be BT. In such cases, where there was a lack of competition, Ofcom or the DCMS would potentially have to step in to appoint a provider and compensate them accordingly through the levy.

107. This leads to the question of whether there is a need to designate a backstop USO provider or providers by placing the ultimate obligation on a single entity or entities. Given that Openreach is the custodian of the majority of the UK's access and backhaul networks it would be the obvious candidate in many regions to take this role on but others could be suitable too—for example, Virgin Media, given its coverage in urban areas. We would also see a vital role for the regulator in ensuring that larger operators did not pursue any unfair predatory pricing of tenders to force others out of the running in more attractive areas.

108. If Openreach became the backstop provider in some areas or nationally it might then subcontract provision to others, effectively allowing those providers to build out their own networks instead of BT always building its own. Nevertheless, we recognise it would be very difficult to incentivise such behaviour through regulation. Potentially, if Openreach were the backstop provider, in a properly functioning market, it would choose to have some of its existing areas of poor infrastructure replaced by a lower-cost provider under contract.

109. Ofcom, or a body appointed by Ofcom, would need to oversee tendering and offer an effective alternative dispute resolution process where disagreements arose between Openreach, other providers, individual consumers or local representative bodies. Ofcom would also need to designate a national or regional single point of responsibility to coordinate, manage and arbitrate between different networks over issues such as network connectivity, and rectification of faults and repairs. Openreach would seem the obvious candidate to take this on, given the extent of, and reliance by other providers on, its core and access networks.

## Funding a USO

110. One way of covering the costs of a USO would be to allow the provider to operate geographical pricing where the cost of provision varied between areas, so prices would be set in line with costs. A justification for geographic pricing is that it costs more to provide services in some areas and the people who live in these areas should be prepared to pay the higher costs. However, as Professor Helm suggested, there are strong arguments for 'socialising' the network costs of utilities.

111. Under a USO only the net costs of providing the obligation, i.e. any costs over and above the consumer revenues received by the provider, should be recovered from a universal fund. An industry levy would spread the additional cost of providing a USO among all providers which would be passed on through subscribers' bills. DCMS and Ofcom would need to estimate the amount that a levy would need to raise and then set the individual charge in line with the total number of subscribers. The levy could then be adjusted over time in line with the actual costs of provision.

112. Gigaclear was concerned that a USO scheme should avoid transfers from smaller providers to BT Group which could subsidise BT's network development further. This could involve some funding from the Exchequer, rather than a levy on operators, or involve a threshold which ensured firms did not contribute to a levy unless and until they achieved a certain turnover.<sup>151</sup> However, it would be inequitable to exempt customers of small providers from contributing towards the costs of the USO as this would be a clear market distortion, favouring small firms over larger ones and it would not be fair to all other customers.

## Affordability

113. Putting the cost of subsidising high-cost connections on to all broadband users via an industry levy could conflict with the aim of promoting uptake. The industry levy will increase the price of broadband to all subscribers, which may be a disincentive to taking broadband, inhibiting the growth of the network. Using public funds would avoid this problem, but this would require the cost to be passed to all taxpayers through general taxation.

114. European and UK legislation requires Ofcom to ensure the universal service is provided at an affordable price. Ofcom suggests in a consultation document that options for achieving this could require uniform pricing of the USO product or price caps on these charges. The Secretary of State has asked Ofcom to consider the case for setting a social tariff. Ofcom will need to determine the parameters for such a tariff, for example data allowances which might apply. A universal service fund could cover the costs for basic broadband for those who met eligibility criteria, such as those in receipt of certain welfare benefits or on low incomes, as happens now for basic fixed telephone lines.<sup>152</sup>

115. The presence of subsidised networks and affordable tariffs, even at broadband speeds of 10Mbps, could have an impact on some providers who offer speeds starting at say 50Mbps, but charged at higher prices. The lower the price of the "basic" USO service, the greater the impact on the revenues that providers (both the USP and others) could earn from higher speed products, as more users decide to take the basic service rather than a faster one. Keeping the subsidised USO product at a fairly basic level would therefore be advisable and not unusual.

**116. We believe that there is a compelling case for expanding the current USO for telephony and dial-up internet to cover broadband, given the vital role it plays in people's lives through facilitating interactions with friends and family, and commercial and public services. A USO should allow all to have access to decent and reliable broadband services wherever they live. The design of a new USO should be in line with the Government's and Ofcom's aspiration for competition in broadband delivery, both at the service and infrastructure level. Ideally, the USO must be designed so as not to impose too great a burden on industry: to incentivise investment, without creating consumer detriment or overly inhibiting take-up.**

**117. We support the Government's preference for an industry-funded scheme at this stage. Given that the rollout of superfast broadband has been supported by £1.7bn of public funding and will bring coverage up to nearly 95 or 96 per cent of premises,**

<sup>151</sup> Gigaclear ([EWC0098](#))

<sup>152</sup> BT offers a social telephone tariff which runs at a loss in order to meet its Universal Service Obligation.

we believe a demand-led approach is now appropriately funded through a levy on communications providers. Like the history of other utilities, this will involve all users covering—up to an agreed limit—the higher costs of connecting the remaining few who wish to connect. An industry levy in our view could legitimately apply to all communication providers including mobile network operators given that mobile broadband will be part of the solution to delivering a national USO.

118. We believe Openreach would be the obvious backstop provider of the broadband USO in many regions as the owner of the national access infrastructure. Where no provider was willing to bid for the USO undertaking in a particular area, then Government or Ofcom would need to decide whether it would be Openreach or another provider who would meet the obligation and compensate them for doing so through the levy.

119. There will be no advantage in setting the USO's speed and other specifications too high at its introduction, since worthwhile interim solutions to improve connectivity such as wireless solutions may not achieve ambitious data downloads and uploads in certain locations. In addition, a higher specification would force industry to pass on the extra cost to consumers as well as in higher charges, and would also reduce the attractiveness of the providers' retail offers and packages. We believe that the Government is right to follow Ofcom's advice to set it at 10Mbps as a minimum at the start. However, the need for an increase in the USO minimum download speed to 30Mbps by 2022 is entirely foreseeable, and the Government should be making active plans for this eventuality.

120. We recommend setting a single USO for broadband which accommodates the reasonable requirements of both domestic and average small business use, given that delivery is over a residential-grade infrastructure. This would be workable and limit distortions to the commercial broadband markets. The USO's specifications will need to define a range of important factors that affect the experience of household or small business connectivity. As well as download speeds, these factors include minimum upload speeds, maximum delay and maximum error rates.

121. Wherever it is realistic, the Government and Ofcom should ensure that the design of the broadband universal service should use and extend existing commercial and community networks, rather than displacing them. We heard in evidence that it should be possible to set incentives for Openreach to meet a USO through buying in services from existing infrastructure providers rather than seeking to overbuild them itself. A diverse structure of physical infrastructure competition is clearly beneficial, not least in allowing benchmarking of infrastructure construction costs and exploiting different techniques and technologies. Ofcom and the DCMS should work together as necessary to establish a regulatory framework that promotes diversity within the provision of a USO.

122. In allocation of a USO, an open procurement process should take place where there is transparency and suitably-sized procurement lots to encourage competition among all providers, small and large. Smaller lots appear to suit smaller alternative network providers offering hybrid solutions but we recognise economies of scale and scope can be gained from larger deployments. We envisage Ofcom, or another similar

**body, taking on an alternative dispute resolution role to arbitrate where disagreements over designation occur. In addition, Ofcom or another body would need to choose the areas to be awarded and run the tendering process.**

**123. There will need to be a regime in place to conduct periodic reviews of the minimum requirements of the USO and any other conditions attached to it. Those companies bidding would need to be fully aware of the timescales for reviewing the USO and be incentivised to invest in solutions which had a credible upgrade path. Ofcom would need to provide clarity over the likely evolution of the USO standard in line with its ongoing communication market analysis and reviews.**

**124. Whilst we realise that a USO will take time to implement, given the costs and technical feasibility work that is required as well as the mapping and designation of areas for tenders, we would nevertheless urge Government to introduce the USO at the earliest point, possibly as early as 2018, once the BDUK rollout is due to complete.**

## 5 A fibre future

125. At the start of its strategic review, Ofcom explained that increasing competition, reducing prices for consumers and encouraging investment in faster networks were its three main aims. There appears to be universal agreement that investment in high-speed connectivity is needed to support long-term economic growth, a cornerstone of the Government's Productivity Plan in 2015.<sup>153</sup> Moreover sub-optimal investment in the underlying telecoms infrastructure can have the effect of causing substantial disruption and inconvenience to people's lives, and result in the provision of a poorer quality of service. Ofcom sees the next decade being all about a strategic shift to large-scale investment in more fibre to the premise networks as an alternative to BT's development of its copper-based technologies.<sup>154</sup>

126. There are polarised views on whether BT made the right choice in opting for the choice of "fibre to the cabinet" for its commercial rollout of superfast broadband. But in 2009, FTTP would have been momentarily more expensive than the FTTC alternative and much slower to deploy.<sup>155</sup> However, there is concern over BT's persistence in clinging on to copper-based solutions. Several of BT's competitors see this as BT eking out as much value as it can from its core copper access network.<sup>156</sup> In doing so, they observe that BT, as a commercial company and owner of a substantial copper legacy, is acting entirely rationally but there is concern it is failing to future-proof the Openreach network or cater fully for the needs of those who rely on it.<sup>157</sup> However, facilitating the ability of other infrastructure providers to invest in fibre is likely to stimulate BT to invest more in fibre.

127. While Sharon White recognised that there was a strong commercial interest for BT "to squeeze the juice" from assets and super charge copper speeds as consumer needs rise,<sup>158</sup> BT recalled that when it launched its superfast programme in 2009 it was told by rivals that there was no demand for superfast speeds and that neither Sky nor TalkTalk chose to sell or market superfast product to their customers for some years after it became available.<sup>159</sup> However, Sky explained that there was a significant cost in upgrading customers from copper-based services to fibre through Openreach. For BT Consumer, the money paid to Openreach for transferring its customers remained within the BT Group and so was less of a disincentive to moving customers to fibre.<sup>160</sup>

128. Over the last 10 years BT has invested £10.5bn in its digital infrastructure, committing over £3bn in its superfast broadband network development.<sup>161</sup> Its commercial fibre programme has extended "superfast" availability to over 21 million premises.<sup>162</sup> At the same time, Virgin Media has been a strong competitor to BT in certain parts of the

153 Government launches plan to fix the foundations of the British economy, BIS, 10 July 2015.

154 *Strategic Review of Digital Communications*, Ofcom, Executive Summary.

155 Australia's plans for a full FTTP rollout had to be abandoned in favour of an approach using a mix of technologies including FTTC and wireless solutions, owing to cost and the scale of the challenge in delivering such a deployment. A report for the Broadband Stakeholder Group in 2008 estimated that FTTP solution in the UK would have cost five times more than a FTTC deployment.

156 BT has announced that it is planning to offer ultrafast speeds to 10 million premises through G.fast, a copper based technology.

157 Q150 [Sky]

158 Q944

159 BT ([EWCO108](#))

160 Q119 [Sky]

161 Our Charter, Building Britain's Connected Future, Openreach, September 2015, page 10.

162 Together BT's commercial programme and the BDUK's subsidised programme have passed about 25m premises.

country, helping push the case for BT's commercial broadband investment through the expansion and development of its own cable network. Virgin Media is investing £3bn itself in improving its fibre network, increasing the network's reach from 13 million to 17 million homes. More recently, BT has announced that it plans to reach 12 million homes and businesses by 2020 with ultrafast broadband<sup>163</sup> through a mixture of technologies including G.fast and fibre to the premise.<sup>164</sup>

129. Ed Vaizey is now talking of a 'Gigabit Britain' for the next decade,<sup>165</sup> although currently there remains some uncertainty over how many consumers want faster services and over people's willingness to pay very much more in subscription fees to obtain higher speeds.<sup>166</sup> Yet growth in trends in data consumption is conclusive in pointing to a need to future-proof networks as data-rich services become more routinely used. Cisco Systems forecasts that global-fixed broadband speeds will nearly double by 2020, reaching 47.7 Mbps, up from 24.7Mbps in 2015, and that global internet traffic will increase nearly three-fold in the same period.<sup>167</sup>

130. The question now faced is whether the UK's current market structure creates the right incentives for long-term investment and competition to deliver a fit for purpose digital infrastructure in the UK. If Ofcom's objective is now to set the right conditions to create more choice for people and businesses, while reducing the country's reliance on Openreach, this will involve encouraging the rollout of more FTTP networks as an alternative to BT's planned investment in copper-based technologies such as G.fast and VDSL.

131. Through its regulation of BT, Ofcom told us that it does not start from what is the desirable level of investment but instead from a position that BT should not be making excess profits, which is why it sets Openreach's prices based on its cost of capital and incentivises it to maximise efficiencies. In so doing, Openreach should then be in a position to invest in the network.<sup>168</sup>

132. There is a risk that BT could just rest on its laurels, believing its incremental programme of VDSL, fibre to the cabinet, G.fast and a bit of fibre to the premises will keep it in the right place for some years to come and not increase its investment overall. If other smaller providers are to invest, they will need certainty that embarking on competitive infrastructure provision is worthwhile and will need to hear the right regulatory noises to gain confidence regarding risk. As things stand, according to Independent Networks Co-operative Association (INCA), the right regulatory environment will encourage more investment.<sup>169</sup> It noted that there was a growing appetite from private investors and communities to get involved, with significant funding going into CityFibre, Hyperoptic, Gigaclear and others. As of last autumn, Gigaclear's funding alone had amounted to more than 10% of the total capital investment committed by BT to the rural broadband

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163 Defined as speeds of 100Mbps or above.

164 'BT to invest billions more of fibre, 4G and customer service', BT Press Release, 5 May 2015.

165 Q1050

166 Average speeds in towns and cities can appear to be low not because of lack of availability but because people have chosen not to take up faster services.

167 Cisco Visual Networking Index: Forecast and Methodology, 2015–2020.

168 Q913

169 Independent Networks Co-operative Association ([EWC0001](#))

programme and Gigaclear told us it had secured more since.<sup>170</sup> Some of the larger nationwide communication providers, including Sky, TalkTalk and Vodafone, are also willing to invest more if the conditions are right.<sup>171</sup>

133. Smaller alternative providers want access to finance, and often would prefer loans rather than subsidies. INCA explained that loans and guarantees which acted to reduce the cost of capital offered a very different profile for a project than grant aid. In the UK at least one local authority, West Oxfordshire, has supported a local project—Cotswolds Broadband—with loan funding instead of a grant. On a larger scale, the Government also provided a loan guarantee scheme, for which Virgin Media had pre-qualified its Project Lightning’s network expansion project.<sup>172</sup>

134. We were told that initially getting access to capital could be a real challenge for new infrastructure providers. The Wireless Infrastructure Group (WIG) explained that for new entrants sources of capital for building infrastructure were particularly expensive and it was only when a company reached a critical mass, that it then was able to tap into the huge pools of infrastructure capital that was looking to come into the sector.<sup>173</sup> As scaling up is difficult to achieve, WIG recommended that any actions that could speed up lowering the cost of capital for the challengers would support infrastructure growth.

135. In the Spending Review 2015, the Government announced it was exploring setting up a new broadband investment fund, to support the growth of alternative network developers by providing greater access to finance. This fund is expected to be supported by both public and private investors, and managed by the private sector on a commercial basis.<sup>174</sup> The Treasury is currently consulting on the design of the fund and plans to select a fund manager by the autumn and to be in a position to begin investing by the end of the 2015/16 fiscal year. **Given the rise in alternative providers, we agree with Ofcom that the future must be about infrastructure competition as well as service competition. In line with this aim, the Treasury’s plan to set up an investment fund for alternative network developers should provide the financial support necessary for network building and enable challenger companies to achieve adequate size and scale to allow them access to low-cost debt which would help enormously to accelerate scaling up of alternative network infrastructure builders in the UK.**

136. Ofcom regulates BT’s access infrastructure in a number of ways to allow third parties to use its assets to provide their own retail services, in competition with BT’s retail and wholesale businesses. Openreach supplies various wholesale broadband services to communication providers that supply broadband at the retail level, enabling rival providers to either to connect their core networks with their customers’ premises using BT’s local loops or to resell BT broadband services on to their own customers. Communications providers can do this by either unbundling BT’s local exchanges and using Openreach’s wholesale products, local loop unbundling (LLU) for standard broadband or virtual unbundled local access (VULA) for superfast broadband, or by using wholesale broadband access (WBA) products sold by BT Wholesale.

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170 Q445 [Gigaclear]

171 Q142 [Sky & Vodafone]; Q363 [TalkTalk]

172 See: Department for Culture, Media and Sport ([EWC0066](#))

173 Q432 [Wireless Infrastructure Group]

174 It will complement the UK Loan Guarantee Scheme for larger infrastructure projects.

137. Ofcom regulates the terms on which LLU and VULA are supplied, and for wholesale broadband access products in selected areas where there is limited competition. Wholesale line rental (WLR) is a wholesale product taken by providers who want to offer fixed-phone-line rental to their customers. This is used extensively by the same operators who supply broadband over BT's access network, as these firms want to take control of the customer relationship and many customers prefer to have a single bill. Wholesale line rental is subject to a cost-based charge control.

138. LLU is a good example of the impact of policy decisions on markets. In the period between 2006 and 2009, Ofcom set out to support the development of LLU-based competition. As part of this strategy, Ofcom reached agreement with BT on retail price floors with no price cap, while lowering the (cost-based) charge control for LLU, to allow room for the new entrants to become established.<sup>175</sup> While this approach enabled BT to make relatively high returns in the WBA market, Ofcom believe it was a key reason behind the success of LLU and the consumer benefits that followed.<sup>176</sup>

139. Ofcom now faces a dilemma over whether and when to introduce a price control for fibre access products. In order to make investment decisions, communications providers require visibility and a degree of certainty of future revenue streams before they are willing to lay fibre into the ground. Ofcom has adopted a period of pricing freedom for VULA in recognition of the risks that BT took on when it decided to invest in 2008. This approach recognised that a firm needs to benefit from sufficient upside potential to offset the downside risk of failure. However, Ofcom has indicated that BT has now enjoyed a significant period of pricing freedom on VULA and said there would be a variety of arguments, some in favour of reduced pricing flexibility and others of maintaining some flexibility to leave room for further competitive entry and expansion.<sup>177</sup>

140. The position of VULA is therefore not straightforward. Setting the wholesale price too low discourages alternative fibre providers from building, as there needs to be margin for new entrants if they are to compete with BT. Leaving the price where it is will discourage those downstream competitors who currently offer LLU based services from actively promoting VULA-based services. Looking ahead, the options appear to be to continue with the current position of no cost-based control and just a 'margin-squeeze test'<sup>178</sup> or regulate the price of VULA product at cost which could bring the price down and remove some of the margin for others to build fibre infrastructure.<sup>179</sup>

141. In terms of the original design of VULA, Sky complained that it did not enable other providers to offer differentiated products to the extent they could through local loop unbundling. At present it is not technically possible for providers to unbundle the fibre product at the exchange, as they can with the copper equivalent. Therefore Sky see the development of VULA (and also G.fast) as technologies created by BT to allow it to cement its advantage in fibre and to continue stretching out the life of its copper assets.<sup>180</sup>

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175 Openreach's charges for LLU are now subject to a cost-based charge control.

176 Ofcom ([EWC0125](#))

177 Ofcom ([EWC0125](#))

178 "There is regulation of VULA to prevent BT discriminating in favour of its own retail businesses: this takes the form of a margin test comparing the margin between BT's SFBB retail price and VULA price with its retailing costs.

179 VULA is currently being reviewed by Ofcom in its wholesale local access market review, with a final decision expected to be made by April 2017.

180 Q124



142. In the context of driving further fibre deployment, we see the choice facing Ofcom as between satisfying the needs of consumers now, i.e. by maintaining lower prices; or the needs of consumers of the future, by encouraging investment in fibre networks and allowing a pricing freedom to incentivise alternative providers to invest. The price of copper broadband product LLU will no doubt keep a check on the fibre price. Not introducing a wholesale price cap on Openreach's fibre broadband for a while more would allow other providers to continue to make a sufficient return on their investments for further network deployment.

### Access to ducts and poles

143. A significant piece of Ofcom's strategy to facilitate network building is to open up access to BT's ducts and poles. This will allow other providers to deploy their own fibre and equipment to deliver services at a lower cost, as well as enabling mobile network operators to connect to their masts and base stations from their own networks. Passive Infrastructure Access (PIA) was offered by Openreach to allow BT's competitors to lay an alternative fibre product of their own, rather than take BT's superfast option which cannot be "unbundled". The situation in other countries, for instance in Spain and Portugal, has demonstrated that the ability to use existing passive infrastructure can dramatically decrease costs associated with fibre deployments and allows operators to direct savings into further expansions. However, it is not entirely clear how far the experience of other countries in this respect extends to the UK—for instance, whether their ducts were in a better condition and offered more capacity and space.

144. We heard that use of existing Openreach's ducts and poles by competitors had so far been minimal. Several witnesses complained that BT's accreditation process to allow personnel access was very restrictive and that the current charges, access and mapping of Openreach's passive infrastructure were not fit for purpose.<sup>181</sup> For instance, we were told that the processes and costs around surveys required to allow other network operators access to Openreach's ducts and poles were prohibitive.<sup>182</sup> Vodafone explained that in Portugal eight years ago there had been no auditable records of its passive infrastructure. However, after the incumbent was incentivised to open up access, it was now possible to order access via an online portal and have fibre pulled through ducts days later.<sup>183</sup>

145. According to Vodafone, there was no reason why that physical infrastructure which was "effectively gifted" to BT should not be used by all competitors in the market.<sup>184</sup> In Portugal, Vodafone had now passed over 2 million premises and connected over 300,000 homes with fibre connections.<sup>185</sup> In its estimation, the deployment had been 25% cheaper in Portugal than in the UK. This had been purely on the basis of using the ducts and the poles that Portugal Telecom had opened up.

146. BT told us that since its passive infrastructure had been available there had been only 17 requests that had led to communications providers pulling their own cables through its ducts.<sup>186</sup> If demand changed, BT said it would investigate what changes could be made

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181 Q364 [Dido Harding]

182 Q116

183 Q133 [Vodafone]

184 In Portugal, the regulator has compelled the incumbent to grant access to poles and ducts since 2006.

185 Q100 [Vodafone]

186 BT ([EWC0116](#))

if there were shown to be any genuine obstacles for competitors that were in its control to remedy. Nevertheless, BT noted that fibre investment involved long-term paybacks and improved access to its ducts and poles would not change this materially.<sup>187</sup>

147. Ofcom are concerned by the low level of take up of the PIA product and is making proposals in its Digital Communications Review to facilitate access further. Sharon White admitted that Ofcom had not given this issue adequate attention in the past but would now require Openreach to provide a new database showing the physical location and characteristics of its ducts and poles and would, if necessary, enforce these changes through its competition powers. This will undoubtedly involve a huge amount of work. However, Ofcom said it was committed to having the detailed guidance on access and dispute resolution ready by the summer.<sup>188</sup> It seems likely that Openreach's own records of the availability of duct and pole space may be deficient and require significant remedial work. There will also need to be a protocol in place to decide who covers the cost of repair to Openreach's passive infrastructure when it is found to be defective but a communication provider wishes to use it for a deployment of fibre.

**148. The requirement of easy access to BT's passive infrastructure on reasonable terms is vital, as it will allow network builders to come to better investment decisions. This issue should have been given a higher priority by Ofcom much earlier. Key to its success will be Openreach providing online access infrastructure maps so that providers can plan their deployments. Pricing will also need to be regulated in a way to encourage investment. Openreach's processes must be realistic and flexible to meet alternative network builders' needs and not just those of BT, and Openreach must demonstrate a willingness to deliver access arrangements that are flexible and encourage take up.**

**149. Given the lack of progress since 2009 in increasing third parties' access to BT's infrastructure, Ofcom must treat this issue with much more urgency. It should set out a programme of work to facilitate take-up of access to Openreach's ducts and poles facilities by non-BT providers. Access arrangements will need to be supported by an Alternative Dispute Resolution process to resolve any problems, perhaps in line with the mechanisms used to support effective functioning of the Electronic Communications Code.**

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<sup>187</sup> BT ([EWC0108](#))

<sup>188</sup> Q960

## 6 Openreach's performance since 2005

150. A central question throughout this inquiry has related to the nature of BT Group's relationship with Openreach and, relatedly, Openreach's performance in network development and maintenance of telecoms infrastructure.

151. In considering the position of BT and Openreach in the telecoms sector today, it is worth reflecting on the historical context. Having been separated from the Post Office in 1981, BT—then British Telecom—was privatised in 1984, with the sale of over 50% of its shares to the general public. At privatisation all the telecoms access infrastructure transferred with the rest of the business to the new partly privatised British Telecom PLC. A second share issue took place in 1991, and a third issue followed with the Government selling off virtually all of its remaining shares in 1993.<sup>189</sup> Since then, aside from changing its name from British Telecom to plain BT, the company has undergone a number of changes.

152. After BT's privatisation, retail price control was the main regulatory mechanism to prevent high prices. A duopoly review in 1991 shifted the emphasis towards encouraging end-to-end competition, for example from cable. But when its effectiveness was shown to be limited, the emphasis shifted again, to access-based competition. This culminated in the market-by-market analytic approach set out in the 2003 European Telecoms Framework. In recent years these market analyses have taken place on a three-year cycle by Ofcom.<sup>190</sup>

153. The most striking change came in 2005 during Ofcom's review of the telecommunications sector.<sup>191</sup> At that time, Ofcom's consultation found that people wanted more choice in telecoms services rather than simply lower prices. Whereas the mobile market was delivering end-to-end competition and choice, this was not happening to any adequate extent in the fixed telecoms sector. Ofcom therefore adopted the principle that, in the interest of increasing competition, its regulation should promote competing infrastructures as deep into the network as was likely to be effective and sustainable.

154. For this to happen, Ofcom concluded that BT needed to make access available to its network on the same terms as it was available to itself. A fundamental question in their review was whether structural or operational separation of BT, i.e. separating out the access network from the rest of the Group, was necessary. In June 2005, as part of the negotiation, BT offered Ofcom a set of undertakings in lieu of Ofcom making a referral to the then Competition Commission for a full market review; Ofcom accepted these and this led to the creation of Openreach.<sup>192</sup>

155. Functional separation of Openreach involved the establishment of a separate access services division with its own management board, CEO and incentive structure. Openreach

189 The Government then relinquished its Special Share in 1997, retained at the time of flotation which had allowed it to block a take-over of the company and appoint two non-executive directors to the board.

190 See: Strategic Review of Digital Communications, Discussion document, Ofcom, 16 July 2015.

191 In April 2004, Ofcom published a consultation of its Strategic Review of Telecommunications. The review was designed to set out a strategic direction for Ofcom's activities in relation to telecoms, and to create a new settlement between the regulator, the companies it regulated and consumers.

192 Ofcom has the power to make a reference to the Competition and Markets Authority under Section 131 of the Enterprise Act 2002. These references can be made where there are "reasonable grounds for suspecting that any feature, or combination of features, of a market in the United Kingdom for goods or services prevents, restricts or distorts competition in connection with the supply or acquisition of any goods or services in the United Kingdom or a part of the United Kingdom."

is required to provide equality of access to BT's competitors through 'equivalence of input'. This allows BT's wholesale customers (i.e. retail competitors that use BT's local access network) to purchase the same wholesale products, at the same prices and using the same systems and transactional processes, as BT's own retail businesses. As well as limiting BT's ability to engage in price and non-price forms of discrimination it was hoped that, by requiring BT itself to use the same products and systems as its rivals, functional separation and equivalence of input would give BT better incentives to improve the products and quality of service that it provides to its competitors.<sup>193</sup>

156. The creation of Openreach, along with lowering the regulated access process for local loop unbundling, have been very effective in stimulating service competition in the communications sector, improving customer choice without excessive prices. The UK retail market has seen the emergence of two of the top four broadband providers, Sky and TalkTalk, come from a base of zero subscribers before functional separation to supplying 40% of the market within 10 years.<sup>194</sup> Nevertheless, a decade on, the Digital Communications Review (DCR) this year has demonstrated that the present system is not working as well as it should. It had been hoped that the requirement for BT itself to use the same products and services as its rivals would encourage Openreach to improve its quality of service and the provision for all its network customers. However, the evidence presented in the DCR demonstrates that Openreach has:

- poor quality of service and customer service standards;
- continuing incentives to favour the interests of BT Group businesses over BT's competitors; and
- poor incentives to invest in fibre rollout.

### Quality of service

157. Openreach's poor quality of service is one of the single biggest issues highlighted as needing urgent attention in the DCR. Although standards of service, specifically customer service, are also problematic in the wider industry, Ofcom has identified Openreach's quality of service provided at a wholesale level to communications providers, including to BT's businesses, as being highly unsatisfactory. For instance, there have been:

- delays in new line installations;
- frequently missed and changed installation appointments;
- increased fault rates; and
- failure to meet targets to fix faults.

158. According to Sky, a history of under-investment in Openreach has led to a range of service quality problems which, in addition to the above, have also included jobs that were simply not completed.

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<sup>193</sup> See Ofcom, Strategic Review of Telecommunications, Phase 2 consultation document, 18 November 2004, paragraph 6.13.

<sup>194</sup> NB: In 2009, Tiscali sold its UK subsidiary to Carphone Warehouse following regulatory approval from the European Commission and the service was rebranded as TalkTalk in January 2010. Easynet was owned by British Sky Broadcasting, from 2006 to 2010.

159. When Sharon White gave evidence, she explained that Ofcom had come fairly reluctantly to setting quality of service standards for Openreach in the provision and repair of copper access lines following its 2014 Fixed Access Market Review.<sup>195</sup> Ofcom has also set tougher targets for Openreach in relation to leased lines in its Business Connectivity Review in March 2016.<sup>196</sup> Since 2011, however, the average time taken between the customer's order and the line being ready had not been reduced, but had increased from 40 to 48 working days. Openreach had also failed to complete one in four leased line installations on the initial date it promised a customer. We were told that Ofcom targets represented minimum standards, and that if BT failed to meet them Ofcom could impose a fine on BT of up to 10% of its turnover.<sup>197</sup>

160. It would appear that Openreach scaled back its resources during the recession but has recruited over 3,000 new engineers in the last two years<sup>198</sup> and has committed to hiring 1,000 more.<sup>199</sup> We were told that Openreach was now exceeding all 60 of the minimum service level targets Ofcom has put in place—though, as Gavin Patterson admitted, this was not widely understood. In an article in *The Telegraph* in May 2016, Mr Patterson apologised for Openreach's poor customer service. He explained that BT was now moving up a gear to ensure it did better, and promised to halve the number of missed appointments where Openreach was at fault within a year.<sup>200</sup>

161. Openreach's reputation for poor service has been borne out by the numbers of constituents writing to MPs in frustration over the delays and problems experienced as a result of its work. Given the scale of the problem and the impact delays have had, Members have stepped in, and there have for example been two debates in Westminster Hall this year regarding BT Openreach's service standards alone. BT's undertakings stipulate that Openreach should treat all providers equally, a condition that is enforced by the Equality of Access Board.<sup>201</sup> Yet Sky told us that the truth of the matter was that all communication providers received very poor service.<sup>202</sup>

162. Issues with service quality have not related to Openreach alone. For example, it offers enhanced service levels at the wholesale level, but these do not appear to be made available by retail providers. In particular, Openreach's highest broadband service care level, offering a six-hour fix, is not offered to consumers by many retail providers. Ofcom has noted that this is an example where improved quality requires industry coordination. Where a wholesale service is offered by Openreach, communication providers need to be able to match the new care level within their own systems and resourcing for it to be offered to consumers. This does not appear to be happening sufficiently.

163. The introduction of a USO could be used to set out minimum service standards for holding communications service providers to account. As is common with other utilities, Ofcom is currently consulting on proposals to bring in automatic compensation for residential consumers and smaller businesses if certain service standards are not met.

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195 Under the targets, the majority of phone lines must be repaired within two working days, while most of those requiring a new line must receive an appointment within 10 working days.

196 'Ofcom demand better business services from BT', Ofcom Press Release, 22 March 2016.

197 Q984

198 Communication Workers Union (CWU) (EWC0032), para 27.

199 BT to invest billions more on fibre, 4G and customer service, BT Press Release, 5 May 2016.

200 'I know BT broadband can be infuriating and I'm the boss of BT', *The Telegraph*, 23 May 2016.

201 The Equality of Access Board is a committee of the BT Group plc Board. It is supported by the EAB Secretary and the Equality of Access Office.

202 Q110

Automating the payment of compensation should help to ensure that consumers are compensated more quickly and easily by their retail provider when they are entitled to payment as a result of service quality issues. Ofcom believes such compensation would introduce incentives for providers to improve service quality and help prevent service quality issues occurring in the first place.

## Level of investment

164. According to BT's annual reports, Openreach is the most profitable business in BT Group. In 2015/16, Openreach revenue was equivalent to 27% of total BT Group revenue. But it had the largest EBITDA—Earnings Before Interest, Tax, Depreciation and Amortization, also thought of as operating cash flow—of the Group at £2.664bn, reflecting the return it earns on its extensive network assets.<sup>203</sup> At the same time, as a capital-intensive business Openreach incurs significant capital expenditure and depreciation costs, which are not reflected in its EBITDA contribution. Around 60% of Openreach's revenue is generated from other BT lines of business, so its contribution to external group revenue is the smallest, at 11%.

BT Financial results for financial year 2015/16							
£m							
	Group summary	Breakdown by business:					
		Openreach	EE	BT Business	BT Consumer	BT Global Services	BT Wholesale
Revenue	18,909	5,100	1,055	3,130	4,598	6,530	2,086
Operating costs	12,329	2,436	794	2,054	3,561	5,482	1,544
EBITDA	6,580	2,664	261	1,076	1,037	1,048	542
Depreciation and Amortisation		1,301	176	198	206	518	212
Operating profit	†3,473	1,363	85	878	831	530	330
Capital expenditure	2,650	1,447	111	138	206	415	177
Operating cash flow	3,098	1,417	310	819	762	475	404
Net debt	9,845						

Source: BT Group Annual Report 2015/16

† Before taxation

Note: Areas such as BT Technology, Service & Operations are not included in this breakdown

165. A concern expressed about BT is that Openreach has been “over-earning” substantially in relation to its cost of capital while Openreach's investments, including in fibre, have not increased since 2009. On BT's regulated returns, Ofcom estimates that the gap between BT's returns and the benchmark cost of capital is £4bn over a nine year period up to

2013/14<sup>204</sup> and that around two-thirds of the estimated gap was accounted for by factors<sup>205</sup> that represented policy choices made by Ofcom when setting charges or through inherent forecasting challenges.<sup>206</sup> The remaining third was due to BT's efficiency against the charge controls put in place.

166. Since publication of the £4bn figure, BT has published its financial statements for 2014/15. Ofcom told us that these show that BT's regulated products have made returns significantly higher than their estimated weighted average cost of capital (WACC) in BT's business lines markets.<sup>207</sup> On this point, Gavin Patterson said in his testimony that he did not accept that BT made "excess profits", contrary to Ofcom's findings.<sup>208</sup> On leased lines, he argued that Ofcom had decided to keep prices high to encourage the business market to move to the next generation of technology.<sup>209</sup>

167. Similarly, Sean Williams, Managing Director, Strategy, Portfolio, Legal and Regulatory Services at BT Group, told us one of the aims of Ofcom's regulation is to promote efficiency by permitting regulated firms to achieve returns above their cost of capital, if those greater returns can be achieved by reducing costs.<sup>210</sup> This works in the national interest, he suggested, by encouraging efficiency in the industry. The savings made by reducing costs are then, under Ofcom's direction, passed onto broadband retailers in the form of lower Openreach prices, after a period of no more than three years. In the intervening period, Openreach is allowed to hold onto the profits generated by dint of reducing costs. However, this argument appears to conflict with Mr Patterson's evidence: in effect it concedes Ofcom's point that BT earns excess profits, but points to other reasons why such profits are acceptable. In any case, it was only in 2014 that Ofcom introduced quality of service standards into their market review process. As is now evident, achieving standards must be a key factor in this price-control determination, otherwise low prices can be achieved at the expense of quality.

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204 Over the same period BT's revenues in these markets were around £56bn.

205 Factors include: incentive effects; balancing policy objectives; price control design; and changes in the way costs are recorded.

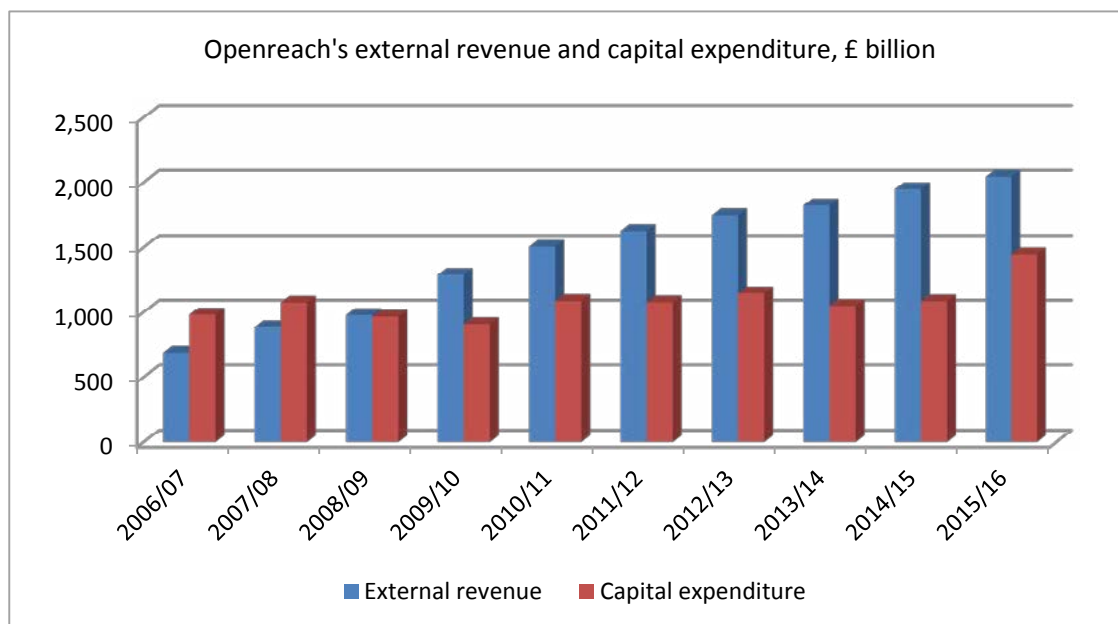
206 Strategic Review of Digital Communications, Discussion document, Ofcom, published 16 July 2015, para 4.52.

207 The weighted average cost of capital (WACC) is the cost of funds used for financing a business, given by the weighted average across all sources of capital such as equity and debt. To calculate the WACC the cost of each source of funds (e.g. the interest rate paid on debt) is multiplied by its share of the total market value of the firm's financing.

208 Ofcom ([EWC0125](#))

209 Q793

210 BT ([EWC0123](#))



168. Openreach has operated under a relatively consistent capital budget of approximately £1bn per annum since its creation. However the mix between different priorities within this budget has changed over time. For the period up to 2014/15, TalkTalk told us that after adjusting for inflation Openreach's capital expenditure had fallen by around 20% in real terms since 2008/09.<sup>211</sup> In its assessment, Openreach's investment in its copper network, on which superfast broadband and most other providers depended for the links to premises under FTTC solution, had fallen by around 50%.<sup>212</sup> A summary of Openreach's capital expenditure by technology type is given in the following table

Openreach capital expenditure spend by programme categorised by technology type £m							
	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Forecast 2015/16
<b>Ethernet Total</b>	112	124	118	164	177	206	261
<b>Copper Total</b>	464	466	460	444	423	424	500
<b>Fibre Total</b>	128	262	313	360	233	165	217
<b>BDUK/SEP Net</b>	-	2	11	12	56	142	262
<b>Other Total</b>	205	234	175	166	161	146	129
<b>Total</b>	<b>909</b>	<b>1,089</b>	<b>1,077</b>	<b>1,146</b>	<b>1,049</b>	<b>1,083</b>	<b>1,369</b>

Source: BT submission ([EWC0097](#))

<sup>211</sup> TalkTalk ([EWC0056](#)), para 6.2. Period between financial years 2008/09 and 2014/15.

<sup>212</sup> FTTC and Superfast Broadband does involves replacing some of the copper with fibre.



169. BT told us that its gross capital expenditure in Openreach had been over £1bn each year for most of the period since Openreach began but that it had grown for each of the past four years. For 2015/16, BT's actual capital expenditure in Openreach was £1.447bn,<sup>213</sup> of which approximately £500m was forecast to be expenditure on copper: both amounts represented significant increases on previous years. Basing its account on the sharply higher peak expenditure in 2015/16, BT pointed out in that year, gross capital expenditure in Openreach was nearly 70% higher (excluding public funding) compared with 2009/10.<sup>214</sup> Based on 2014/15, it would be just 19 per cent higher.

170. In May 2016, BT announced new investment plans in fibre, 4G and customer service. This was the first investment announcement following BT's acquisition of EE, earlier in the year. Together the Openreach and EE businesses plan to spend around £6bn in capital expenditure over the next three years.<sup>215</sup> Given that Openreach's capital expenditure last year was £1.447bn and EE's had been running at £500m per annum, this appears to us to represent a continuation of last year's spending levels, rather than any substantial increase. Yet even so, BT emphasised that its new investment plan was "subject to regulatory certainty," indicating that it could only make big investments in infrastructure if it knew that its business would not face interference.<sup>216</sup>

**171. BT has failed to improve already poor quality levels at Openreach in recent years, while overall investment has remained flat until very recently. For its part, Ofcom was slow to introduce minimum standards of service with financial penalties for Openreach, happening some nine years after its creation. Ofcom regulates for competition, and its charge control regime has kept a downward pressure on prices, so that the UK's communications prices are among the lowest compared with similar EU countries. But this mechanism has not been successful in holding Openreach to an adequate quality of service; and it is an open question how effective overall it has been in stimulating investment in Openreach's infrastructure.**

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213 BT Group Annual Report, page 89

214 BT ([EWC0123](#))

215 BT to invest billions more on fibre, 4G and customer service, BT Press Release 5 May 2016

216 Following the merger, there should be opportunity in the next few years for BT to achieve significant operating cost and capex synergies through integration of some parts of the business and network sharing.

## 7 A new broadband utility?

172. Although functional separation was a key outcome of Ofcom's 2005 telecommunications review, Ofcom is now concerned that this model has failed sufficiently to counteract the embedded conflict of interest between BT and Openreach, and it has concluded that further reform is required. Ofcom believes that Openreach must behave like, and be seen to behave as if it were, an independent company. Ofcom has indicated that full structural separation, in which Openreach would be spun off as a separately quoted company, has not been ruled out. In evidence to us, Professor Dieter Helm, a prominent economist specialising in utilities, infrastructure and regulation, made a robust challenge to the status quo in regard to the UK's communications market. Professor Helm argued that the only way Openreach can "behave like" an independent company is for it actually to be an independent company.<sup>217</sup> He saw the DCR as offering a key turning point for change, but feared that Ofcom is baulking at making a difficult decision and failing to follow through on the logic of its own analysis.

173. Professor Helm's view is that Openreach's status within BT creates inherent conflicts of interest in favouring BT over other users of its network, and that the regulator will find it ever more difficult to regulate Openreach effectively. Were Openreach to be an independent company, he believes it should be regulated as a utility; it would then benefit from a significantly lower cost of capital, leading to more investment in infrastructure and potentially lower broadband costs for consumers. Such a company, in his opinion, would be a natural candidate for "managing" a universal service obligation, even if not necessarily providing all the infrastructure or investment itself.

174. According to Professor Helm, under a regulated asset base (RAB) model Openreach should become the overall broadband system operator, be licensed to develop and run national broadband infrastructure as a form of utility.<sup>218</sup> In return, it would be provided with a guarantee that its licensed functions would be financed. To do this it would levy a use-of-system charge across its entire customer base. Its resulting cost of capital would be low, given the financial protections in place, and it could with confidence leverage private funding to complete and upgrade the broadband network.

175. SSE, an energy company, also identified some advantages of a utility-style approach for telecoms.<sup>219</sup> SSE explained that a utility approach for broadband could allow infrastructure to be financed more efficiently by a greater range of potential investors, whose confidence to invest would be supported by greater understanding of how new discrete networks could be absorbed into a logical utility whole. Prospective providers of superfast broadband infrastructure should be able to "plug in" their network to a national access network that provides a platform through which any retail service provider could supply their services to end customers on the new network on an open-access basis.

176. Nonetheless, there are marked differences between the communications market and those of electricity, water and gas. In broadband and telecoms, in direct contrast to many utilities, the original incumbent operator BT faces infrastructure competition at several levels of the network; and service competition, as multiple communications providers

217 Professor Dieter Helm, New College, Oxford ([EWC0102](#))

218 The regulatory asset base (RAB) usually refers to the measure of the net value of a company's regulated assets used in price regulation.

219 SSE ([EWC0047](#))

compete to supply telecoms services to consumers by reselling services or via use of Openreach's access network.<sup>220</sup> In providing local access infrastructure BT competes with Virgin Media for around 45% of the country's households today and Virgin plans to extend its network to reach around 60% of households. There are many other smaller access network providers, for example Gigaclear and Hyperoptic.<sup>221</sup> Moreover, Sharon White told us that she saw the possibility in the longer term for 40% of households to benefit from competition in local access infrastructure where Openreach's infrastructure would be subject to competition from at least two challengers (e.g. Virgin Media and another provider).<sup>222</sup> A further difference is that the communications market is characterised by a quicker pace of technological change, where the asset lives associated with infrastructure are much shorter than in other utilities. There is thus a greater risk of costs being stranded and not being recoverable.

177. In fact Openreach operates under a near-RAB regime at present. Ofcom told us that a more fully RAB model could be used in certain circumstances to drive investments in a particular asset but that it saw problems with this approach.<sup>223</sup> It appears to remain Ofcom's view that it is better to use competition to drive investment in network upgrades and a fully RAB approach would conflict with competition in the access network.<sup>224</sup> It could also potentially allow exploitation of market power by a dominant network operator to driver higher prices, making customers who do not value a service upgrade still pay for it.

## Incentive to invest in national infrastructure

178. Like any company that wishes to raise outside finance, BT faces a cost of capital from the market, which is a function of its costs of debt and equity. BT confirmed to us that Openreach does not have its own capital structure or debt. Financing is raised at BT Group level rather than at the Openreach level. In assessing all projects in Openreach and for other parts of the BT Group, BT uses a group cost of capital, which is currently 10.4% (nominal pre-tax rate).<sup>225</sup> BT Group's average weighted cost of capital has most recently been estimated by Ofcom to be 9.9%. Ofcom then disaggregates this estimate to reflect the activities and risk profiles covered by Openreach and the rest of BT.<sup>226</sup> It has recently calculated Openreach's cost of capital to be 8.8%, and that of the rest of BT to be 12.4%.

179. There was some debate about the effect that structural separation would have on Openreach's costs of capital. Sean Williams, BT's managing director of strategy, portfolio policy, argued that Professor Helm's assertion that BT's cost of capital would be cheaper for Openreach outside BT was completely wrong.<sup>227</sup> According to him, a separate Openreach would be seen by investors as more of a risk than it is today, because the new, smaller company would not be able to spread risks across the wider Group. Professor Helm

220 There are infrastructure-based competitors at several stages of the network: e.g. Sky & TalkTalk have invested in infrastructure as far as most of BT's exchanges.

221 Independent Networks Co-operative Association ([EWCO001](#))

222 [Q946]

223 Ofcom ([EWCO125](#))

224 In a RAB model the regulator guarantees the regulated firm a return on its assets, which would be extremely difficult to do in a setting where those assets may be rendered obsolete by a competitor taking away the business when a customer switches from one network to another's, for example from Openreach to Virgin or Gigaclear, who use their own infrastructure and not Openreach's.

225 BT ([EWCO116](#))

226 See: Ofcom ([EWCO125](#))

227 BT ([EWCO123](#))

argued that the opposite would be likely.<sup>228</sup> He also stated that BT would not, in practice, invest less at Openreach, if it were forced to hive off the operation, comparing the situation to the past break-up of British Gas—where he maintained that there had been no such investment effects. Apart from there being clear differences between the two industries, BT has strongly warned about the disruption any break-up might cause. This is an issue which the Minister also took seriously.

180. Sharon White suggested that whether a structurally separated Openreach would invest more than it does at present was still an open question, but that Ofcom’s ultimate objective was to see more investment in the network.<sup>229</sup> As the regulator, Ofcom aims to incentivise BT to make efficiencies so that increased investment goes into the repair and resilience of their network. The extent to which this has been happening is questionable.

Weighted average cost of capital comparison				
	Openreach	Openreach	Ofgem <sup>3</sup>	Ofwat <sup>3</sup>
	Pre-tax nominal <sup>1</sup>	Real vanilla <sup>2</sup>	Real vanilla	Real vanilla
Cost of equity	10.2%	4.8%	6.0%	5.65%
Cost of debt	5.4%	2.1%	2.6%	2.6%
Gearing	30%	30%	65%	62.5%
WACC	8.8%	4.0%	3.8%	3.7%

Source: Ofcom

Note: 2016 Openreach WACC vs 2014 Ofwat/Ofgem WACCs

1. The pre-tax nominal rate of return is the rate of return that an investor receives before taking off any taxes paid by the investor and without adjustment for inflation. The real rate of return is the rate after adjustment for inflation. For example, if the nominal rate of return is 5% and inflation is 2%, then the real rate of return is 3%.
2. The vanilla WACC is estimated by reference to the post-tax cost of equity and the pre-tax cost of debt, while the pre-tax WACC is estimated by reference to the pre-tax cost of equity and debt
3. These rates are applied by Ofgem and Ofwat to those parts of the energy and water sectors which they regulate.

181. From the information we have seen on other utilities’ capital costs, it would appear that they do attract costs of capital well below almost any other asset outside of government bonds.<sup>230</sup> Similarly, Openreach’s estimated weighted average cost of capital<sup>231</sup> is only a little higher than that of the utilities above. Utilities are particularly attractive investments to institutional investors such as international pension, life assurance and wealth funds, who are looking for the certainty of return and low risk that they represent. From Ofcom’s competition-based perspective, it did not consider that the primary driver of the cost of capital was structure, but rather the financial risk of BT’s activities, i.e. the extent to which BT’s return on capital was guaranteed.

228 Professor Helm ([EWC0102](#))

229 Q911

230 See: Ofcom ([EWC0125](#))

231 Weighted average cost of capital (WACC) is a calculation of a firm’s cost of capital in which each category of capital is proportionately weighted. All sources of capital, including stock, bonds and any other long-term debt, are included in a WACC calculation.

182. BT provided us with a survey it commissioned which suggested, among other things, that more than half of the institutional investors surveyed thought that cost of capital (58%) and the level of risk of investing in Openreach (56%) would increase if Openreach were structurally separated from BT Group.<sup>232</sup> However, the survey predominantly canvassed existing BT investors, 82% of those surveyed, and provided no indication whether these represented a cross-section of investors overall.<sup>233</sup> It is not clear whether BT currently attracts the same proportion of long-term institutional investors as would be reflected in the capital and equity markets as a whole. Finally, as Ofcom has indicated, BT is earning above-market returns and appears to benefit financially from the conflict of interest between its wholesale and retail businesses. If these advantages were not maintained following a split, that would create a financial incentive for current investors to prefer the current model to structural separation.

183. Given that 90% to 95% of Openreach's activities are regulated by Ofcom and subject to price caps, it is already fairly close to a regulated asset base model. Yet, as the Committee's advisory panel has highlighted, the fact that Openreach has to pass BT's investment "hurdle" rate, which is set at the BT Group weighted average cost of capital (10.4% by BT's estimate), while Ofcom allows it a rate of return at 8.8% suggests that Openreach is presently under-investing in its infrastructure and business. This also suggests that the utility-like part of the Group, Openreach (sitting inside BT), is in effect subsidising riskier projects in the rest of the Group such as sports rights and IP TV channels. By requiring a higher rate of return (10.4%) than the estimated cost of capital for Openreach (8.8%) BT will, inevitably, reduce investment in Openreach to below optimal levels in this part of the business. Profitable projects whose expected return falls between these rates will not be pursued, to the likely detriment of shareholder value. The profile of BT's potential investments is not clear, but the amounts of profitable infrastructure investment forgone as a result of the 1.6% gap between hurdle rate and cost of capital could potentially be hundreds of millions of pounds a year. Shareholders, as well as BT's customers, therefore, should welcome higher levels of investment in the local access network. Also, in the long run, BT's investment approach will push up the Group's cost of capital, as riskier areas will over-expand and safer areas invest too little.

184. In relation to its use of a group hurdle rate to guide investment decisions, BT told us that it was not true that the Group utilises some of the returns from Openreach in an incorrect manner. BT explained that all the costs of competitive services such as sports rights were both accounted for in the retail business and funded by retail charges. However, even where Openreach's products are under a charge control regime, it is not clear from BT's accounts what contributions each division's free cash flow makes to wider Group spending and to the company's dividends to shareholders. It could be the case that Openreach is shouldering a disproportionate amount of these costs. In fact, Ofcom has confirmed that following a review of the way BT allocates its costs to regulated services, it estimated that BT had overstated costs in its 2014/15 regulatory financial statement (and therefore underestimated its returns) by £225m.<sup>234</sup> This shows the ability of BT to exploit the Group's vertical integration with Openreach and potentially to manipulate Ofcom's charge controls and market reviews to its advantage.

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232 The survey was carried out by Brunswick Insight for BT and completed in April 2016.

233 71% of respondents were based in the UK and were made up of a mix of telecoms buy-side analysts, generalist fund managers and telecoms fund managers.

234 Ofcom ([EWC0125](#))

185. Communications providers who rely on the Openreach's infrastructure argue that BT has not invested enough of the money it makes from the Openreach network back into the network. Although no-one has calculated the quantum of the underinvestment, this claim does correspond to the way we discovered that BT allocates capital between its various businesses on the basis of a single group-wide hurdle rate. We consider this is bound to lead to sub-optimal investment in the relatively low-risk Openreach.

**186. There appears to be compelling evidence that BT Group is exploiting the position of vertical integration to make strategic decisions that favour the Group's priorities and interests, at the expense of its access infrastructure business. BT does not lack access to capital. Its current structure allows it to use Openreach's utility-type assets to cross-subsidise riskier activities elsewhere in the Group, while significantly under-investing in Openreach.**

**187. It came as a surprise to us that BT employs an investment hurdle rate significantly above Openreach's actual cost of capital, as estimated and allowed for by Ofcom. At the same time, BT's use of an investment hurdle rate which is 1.6% above Openreach's cost of capital means that a potentially very significant amount of annual investment in broadband access and services, investment that would add to shareholder value, is not made. While we understand the desire for BT and other providers to balance infrastructure investment with their own commercial interests, this forgone investment in maintaining, upgrading and supporting Openreach's infrastructure is damaging both to public welfare, to shareholders and to consumers. We believe there is a pressing need to liberate more of Openreach's revenue for investment in broadband and the evolution of its telecoms infrastructure. As a result there is a need to consider closely BT's governance and capital structures as well the adequacy of its oversight and regulatory arrangements.**

**188. On the evidence presented, it seems very likely that Openreach would invest more in upgrading its infrastructure if it were a separate company, since it would not be competing with other Group businesses and would be freed from the Group hurdle rate on investment. By adopting its current approach, BT is likely to be sacrificing shareholder value and public benefits that would flow from these investments. This is likely to mean that substantial amounts of money—potentially totalling hundreds of millions of pounds a year—are not being invested in developing and upgrading Openreach infrastructure which is critical to the UK economy and most people's lives. We therefore recommend that Ofcom undertakes an assessment to ascertain the financial effect of BT's failure to invest in Openreach at its true cost of capital.**

## 8 An independent Openreach?

189. In regulating BT, given its vertically integrated structure,<sup>235</sup> Ofcom faces the dual task of controlling its monopoly power over essential infrastructure and preventing it from discriminating in its treatment of rival retailers. The regulator therefore has to expend a great deal of time preventing such behaviour happening. Separation would eliminate the opportunity for such discriminatory actions but would not remove Openreach's potential abuse of its significant market power.

### Position in Australia, New Zealand, Singapore and Sweden

*Structural separation requirements have been applied in Australia, New Zealand and Singapore.<sup>236</sup> In all three of these countries, the imposition of structural separation was one condition of next-generation broadband network development. We have also set out the arrangement in Sweden.*

*Australia opted for a model of structural separation based on Telstra's and Optus<sup>237</sup> access networks. The government-owned NBNCo has been responsible for rollout of a FTTP network (although this is now based on a mix of technologies). Telstra was forced by legislation to structurally separate. It also de-commissioned its copper and cable networks and leased these assets to NBNCo before migrating its customers to the new NBNCo network. This case in particular illustrated the scale of the practical challenge associated with structural separation. While the superfast broadband initiative was announced in 2009, agreement with Telstra and Optus to separate their networks was only reached in 2014.*

*In setting up public-private partnerships for the rollout of fibre, the New Zealand government insisted on wholesale-only infrastructure providers and prohibited retailers of broadband and telecoms services from integrating with these. This in turn induced Telecom New Zealand to split itself up into separate infrastructure and service companies, Chorus and Spark respectively.<sup>238</sup> With the owner of the monopoly infrastructure separated from retail activities, regulation became purely a matter of controlling the exercise of market power, i.e. setting cost-based price controls where deemed appropriate. This is the approach used by Ofgem, the energy regulator, for gas and electricity markets in the UK.*

*In Singapore, the government commissioned the building of a national 'fibre to the home' network to 100% of premises.<sup>239</sup> The contract was awarded to a structurally separate 'NetCo' which was required to build and maintain the network and offer passive access products. In addition, a separate contract was awarded to an operationally separate regulated active network operator, 'OpCo', which provides active access services.*

235 Vertical integration is an arrangement in which a single company controls the entire supply chain, e.g. BT controls the local access infrastructure (Openreach), other network infrastructure (BT Wholesale and Ventures) and its retail businesses (BT Consumer and BT Business and Public Sector) and so provides end-to-end services to consumers.

236 See report completed for Ofcom by Analysys Mason

237 Telstra is Australia's largest telecoms company, previously publicly owned. Optus is Australia's second largest telecoms company, a wholly owned subsidiary of Singtel.

238 Chorus became New Zealand's largest fixed communications utility business and Spark remained New Zealand's largest provider of communications and IT services.

239 Fibre to the Home, hereafter abbreviated as FTTH. NB: Singapore is one of the most densely populated countries in the world, which makes 100% FTTH coverage economic where it has not been elsewhere.

*Retail service providers can choose whether to build their own commercial active network operator, or to buy services from the regulated OpCo. Structural separation between the winning bidder for the NetCo, NetLink Trust, and the incumbent, Singtel, has been achieved using a trust structure.*

*It should be borne in mind that all three of these broadband rollouts given above have received significant injections of public investment.*

*In Sweden the objective is to provide 90% of all households and businesses with access to connections of 100Mbps by 2020. The aim is to drive user demand with local communities and not-for-profit organisations taking the lead, supported by regional and national Government.*

*In 2008, TeliaSonera, the former national incumbent, formed a wholly-owned subsidiary called Skanova to sell wholesale network capacity on equal terms to both its own retail arm and competing broadband providers. Skanova operates in similar way to BT's Openreach. Skanova provides network capacity to 160 operators in Sweden, including local authorities, which have helped deploy fibre to the premises. Given that Skanova is operator neutral, it is able to provide network capacity to local bodies that wish to choose their own local third-party service providers, using its national wholesale network*

190. BT extols the strengths of the current arrangement. According to Gavin Patterson, Openreach is able to draw on the balance sheet and know-how of the wider BT Group.<sup>240</sup> For example, Openreach benefits from BT's capital as well as the £500m a year that BT invests in research and development. In addition, when Openreach invests in new services, it benefits from having BT as an 'anchor tenant', which guarantees a route to market and lessens the risk of making investments. Accordingly, the business case for its superfast broadband investment expected to achieve a payback on a BT Group basis of over 10 years when the investment decision was made; yet the payback at the Openreach level would have been nearly 20 years, when the benefit of retail margins were taken out of the case.

191. Ed Vaizey has said "be careful what you wish for" to those pushing for a separate Openreach.<sup>241</sup> He foresees that structural separation would be fraught with difficulties and could take many years to achieve.<sup>242</sup> Moreover, Gavin Patterson, BT's chief executive, has threatened that he would respond to an attempt to force a sell off of Openreach by cutting investment in the network and warned of ten years of litigation.<sup>243</sup> Based on its experience of functional separation after 2005, BT claims that full separation would take several more years to achieve and estimated the cost of functional separation alone had been in excess of £1bn.<sup>244</sup> Nonetheless, in response to Ofcom's initial conclusions in the DCR, the Government stated that it agreed with Ofcom's view that the current relationship between BT and Openreach would not deliver what the country needs for more competition, better innovation and better service. It went on to say:

240 BT ([EWC0108](#))

241 Q1116

242 'Ed Vaizey delivers blow to rivals' hopes of BT broadband split', Financial Times, 30 September 2015.

243 'BT chief warns of legal quagmire over proposal to split company', The Telegraph, 8 July 2015.

244 BT ([EWC0108](#))



The Government believes that Ofcom should be firmly focused on taking whatever action is needed to correct the competition problems identified, and to promote growth of the digital economy, however radical a change that might be.<sup>245</sup>

192. Undoubtedly there would be many complexities to overcome in carrying out separation, such as the division of systems and assets, transfer of people and pensions, over two million wayleave agreements to be reassigned, reissuing of bonds, and the tricky situation of determining where Openreach's boundaries should lie. That said, there could potentially be practical steps taken to ease some of the burden; for example, it is not out of the question that the BT proprietary name could transfer to the new entity so that the need for wayleave and contract amendments was obviated. However, clearly other BT businesses' holding contracts would need to be taken into consideration too and a judgment made. In practice, Ofcom's measured approach within the DCR and its current negotiations with BT—with regard to BT developing and publicising its infrastructure map, for example—is treading a path that would be necessary, in any event, if it decided to recommend that Openreach be subject to structural separation.

193. The position of BT's pension scheme was also raised during our inquiry. BT pointed out that the returns from Openreach contributed to the overall Group profits which themselves funded BT's historic pension liabilities and that many of these liabilities arose from past Openreach employees. Gavin Patterson told us that BT's pension fund had a significant pension deficit that ran—depending on how it was valued—into billions of pounds. He argued that if separation were required then the scheme's trustees would be likely to find the covenant for Openreach would not be as strong as the one currently provided by the BT Group.<sup>246</sup>

194. However, it is uncertain how big a stumbling block the pensions issue would be in reality. BT's scheme is the largest private pension scheme in the UK in terms of assets and so it would be a significant undertaking to split. But there are examples of other companies separating and so it should not be seen as an unsurmountable task.<sup>247</sup> There could be measures taken to help. Potentially, Government could be invited to extend the Crown guarantee to cover the members of the new Openreach scheme. Such an undertaking would be contentious, but it has been suggested that the issue of BT pensions should certainly not be a “deal breaker”.<sup>248</sup>

195. If BT Openreach were to be separated there is a risk it could undermine the confidence of other investors towards the sector. Liberty Global, Virgin Media's new US owner, has backed a £3bn investment in network expansion. Tom Mockridge, Virgin Media's chief executive, made it quite clear to us that if BT were forced to make a divestment of such scale then his parent company would be unlikely to make further network investments in the UK.<sup>249</sup> Clearly, there are further reasons why Virgin Media and other companies would not

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245 Government sets out its response to Ofcom's Strategic Review of Digital Communications and Business Connectivity Market reviews, DCMS, 30 March 2016.

246 Q804

247 See article by John Ralfe, an independent pension consultant and expert witness for the Competition Commission in its 2012 inquiry into BT pensions. 'BT's mountainous pension liabilities hampers spin-off', Financial Times, 30 March 2016.

248 *ibid*

249 Q373

wish to see Openreach become independent. Gigaclear’s chief executive, Matthew Hare, suggested that a separate Openreach would be a more formidable competitor but while it remained within BT it would maintain its poor performance and underinvestment.<sup>250</sup>

196. In Professor Helm’s opinion, a compromise position, where Openreach is not fully separated from BT, would create a host of unintended problems and regulatory costs, and delay broadband investment. He has called for a separate Openreach with a single management focused entirely on “broadband Britain”, neutral between all the competitors in the retail market and delivering the service at a very low cost of capital<sup>251</sup>—a view shared by several of BT’s rivals.<sup>252</sup>

197. Given all the concerns, Ofcom has firmly stated that continuing the status quo is not an option. Many of the concerns it identified in 2005 still exist today. Ofcom has therefore decided that reform is necessary to give Openreach greater independence and autonomy. Under a new reformed structure, Ofcom concludes that Openreach must have:

- more independent governance structures and processes, with a responsibility to serve all wholesale customers equally;
- independent technical and operational capabilities;
- greater autonomy over its budget, and over its strategic and operational decision making; and
- an ongoing responsibility to consult with all customers in the same way.<sup>253</sup>

198. As well as full structural separation, Ofcom is considering whether a strengthened model of functional separation could work. Ofcom has also found that there is a pressing need for Openreach to consult its customers on strategic decisions regarding its network, so that they can be properly taken into consideration.

<i>Ofcom has set out three models which would strengthen separation</i>	
<b>Functional separation with independent governance</b>	<i>Creation of a divisional Board with non-executive members who act independently from the group Board</i>
<b>Legal separation</b>	<i>Upstream business is established as a separate legal entity within the wider group, but remains under the same overall ownership</i>
<b>Structural separation</b>	<i>Split of the vertically-integrated operations into separate legal entities, with no significant common ownership and ‘line-of-business’ restrictions to prevent them re-entering each other’s markets</i>

250 Q462

251 Professor Dieter Helm, New College, Oxford ([EWC0102](#))

252 See Sky UK ([EWC0072](#)); TalkTalk ([EWC0056](#))

253 Digital Communications Review – Initial Conclusions, Section 6

199. Increased functional separation could involve Openreach becoming a wholly owned subsidiary of the BT Group, with its own board of directors and an independent non-executive Chair and other non-executive directors. Openreach could in effect be an incorporated subsidiary in which the BT Group is a passive investor. The independent Openreach Board would need to have the capability and resource to draw up its own strategy, budget and investment plan, possibly publishing its requests for funding to the main BT board so there was absolute clarity over its determinations and requirements.

200. There would need to be an open dialogue between Openreach and the BT board so that no financial settlement could be unfairly imposed on Openreach. We would see Openreach as having an ability to raise funds within agreed limits potentially applying directly to the capital markets in its own name and by funding certain network developments through co-financing ventures with the communications providers who were the users of the network. This would enable Openreach to spread the risk of such investments with others given the uncertainty over returns. Clearly, Openreach would have fiduciary responsibilities to the BT Board and would need to act within delegated parameters to prevent jeopardy to the wider Group's credit profile. Openreach would continue to have an explicit responsibility to serve all its customers equally, and as Ofcom has suggested, this could be established through the objectives and purposes of the company in its articles of association.

**201. We have considered the case made by Professor Helm for establishing a standalone broadband utility provider using a regulatory asset base model. While the concept of having a single system operator could be conducive to the management of a universal service obligation for broadband, we believe the differences between the communications market and other traditional utility markets are too great. There is already a wide level of competition in the communications access infrastructure market, and real potential for this to grow. It is not clear to us how the presence of a utility-style operator would be compatible with promoting competition or would work successfully alongside current market players such as Virgin Media, to say nothing of the many other smaller providers of broadband access infrastructure, without stifling competition and the growth of alternative networks. We also consider that there is a significant risk of disruption to investment in and by Openreach, were BT forced into a structural separation.**

**202. Ofcom set out a very cogent case in its Digital Communications Review for full separation of Openreach from BT Group, yet it stopped short of making an outright recommendation for such action at that stage given concerns over difficulties of implementation, possible disruption to investment and likely response by BT. It is a very difficult judgment call as to whether the benefits of full structural separation would outweigh the likely significant disruption and fall-out to the wider industry and consumers. However, there is good reason to suggest that a more independent Openreach might increase infrastructure investment significantly.**

**203. We consider Ofcom has been right not to rule out full separation; that option should be kept firmly on the table. Ofcom has said that the proposals BT has made to date on governance, performance, status and other arrangements of Openreach have not gone far enough. In our judgment Ofcom must remain resolute in its negotiations with BT to ensure the reform necessary to establish the quality and availability of communications services needed for UK consumers and businesses is delivered. If the regulator were to place more emphasis on Openreach's quality of service—an area**

which Sharon White admitted has been comparatively ignored until now—BT would voluntarily invest more in the infrastructure to avoid significant penalties. Should BT fail to offer the reforms and investment assurances necessary to satisfy Ofcom’s and our own concerns, then the regulator will need to set in train the steps to enforce full separation of the Openreach business.

204. In any event, in order to cement Openreach’s independence, we recommend that in future Openreach should be required to set out and publish a five-year strategic investment plan for comment and agreement with the BT Group Board. This would enable it to set out its financial needs, in a transparent and comprehensive manner. Should Openreach remain part of the BT Group under a strengthened model of functional separation, BT should be obliged to allow Openreach to raise finance independently in the capital markets in its own right, and to make investments that meet the business’s own cost of capital. We have every reason to believe that Openreach would be a very attractive investment vehicle to longer-term institutional investors, who could in turn facilitate increased investment in infrastructure.

205. Throughout this inquiry, it has been very clear that the communications sector is characterised by bad internal relations between its main players. With the exception of areas such as technical standards and disaster recovery there has been little co-operation between competitors. This is regrettable because there are other areas—such as training and skills—where more open discussion and co-ordination would benefit the whole industry and its customers. We understand that the industry will continue to be driven by competition, but we are disappointed by companies’ frequent recourse to litigation and failure to adopt a more cohesive approach.

## 9 Future work

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206. Over the course of this inquiry we have been aware of several significant consumer-related broadband and communications issues which we have not been able to cover in this report. Instead we propose to return to these in the autumn, holding one-off evidence sessions looking at a variety of specific areas. For instance, there is much concern over the way internet service providers use misleading “up to speeds” when advertising broadband services when it would be far more accurate to provide more realistic predictions—a position which the Minister described as “an utter joke.”

207. In facilitating competition, it has been a slow and protracted path in bringing about faster and less costly ways to enable people to move between providers of communication services. This has become a more complex regulatory issue given the increasing tendency for consumers and providers to prefer packaging services where people buy phone, internet and TV content together. Over the last few years Ofcom has been working towards introducing gainer-provider switching and extending this to all deals regardless of whether someone chooses to buy services separately or as a package. An associated issue is the standards of customer service delivered by the communications industry. In this report we have focussed on the position of Openreach but we are also aware that standards have varied and continue to vary greatly among providers. Ensuring customers have proper redress when things go wrong and the ability to switch providers without disruption are two connected areas that we will cover in the autumn.

208. Finally, given that EU law covers telecoms, internet, broadcasting and transmission services, we will consider their provision in relation to the UK’s decision to leave the European Union. For example, the position over roaming mobile charges for those travelling to EU member states, which were due to end, and the way the ‘Country of Origin’ principle operates in relation to broadcasting of services across Europe but enabling a broadcaster to be registered and regulated in one state.

## Conclusions and recommendations

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### BDUK programme

1. The progress made since 2010 in providing superfast broadband access has on balance demonstrated that the Government was right to go with the BDUK scheme which principally involved BT and deployment of its fibre-to-the-cabinet solution. The Minister was adamant that this decision was key to the programme's rapid rollout. Without doubt, the alternatives would have been unaffordable in 2010 and would have taken very much longer to deploy. Clearly there has been a trade-off between competition, comprehensive coverage, speeds, costs and future proofing the network. Notwithstanding the problems and criticisms, BT and the local bodies are to be congratulated on reaching the 90 per cent coverage target. (Paragraph 29)
2. The UK is currently doing well in comparison to similar EU countries on superfast broadband deployment: geographic coverage and take-up of superfast broadband in the UK are the highest of the five largest EU economies, while prices are among the lowest. In spite of this, the UK scores very lowly on fibre-to-the-premises deployment and there are growing concerns that an over-reliance on Openreach's copper access network, and its supposed lack of ambition for driving fibre to the premises across the country, could result in a hard-to-solve digital divide beyond 2020. (Paragraph 30)
3. As the BDUK programme enters its next phase, it is important that lessons are learned from the performance so far. Given its importance to the future of connectivity in the UK, its significance in addressing market failure and the lively debate about progress with superfast broadband rollout, we were surprised that Ofcom has not yet provided any detailed analysis or verdict on how the BDUK programme has performed so far as part of its ten-yearly strategic Digital Communications Review. This was a significant omission on Ofcom's part. (Paragraph 31)
4. An unmistakable downside of the BDUK programme was the lack of transparency in BT's costs and deployment plans, the apparent effect of which has been to stifle competition and thwart other network providers' planning. It is clearly unacceptable that BT has been allowed to get away with using such commercial secrecy in Government contracts when it may potentially have been the recipient of some £1.5bn of public funds to expand its own network base. Whether by accident or design, this has had the effect of reducing transparency and increasing uncertainty. Many households and businesses have been forced to hang on indefinitely to find out whether they would be covered, while competing network providers have been discouraged from making investments and capital commitments. (Paragraph 32)
5. One consequence of BDUK's and BT's rapid rollout is that the programme appears to have tackled the easier-to-reach premises first and has not delivered coverage to whole areas as such. This has left a patchwork of premises that have not been reached, and much uncertainty among local residents as to whether or not they will be connected or receive improved speeds and in turn has been compounded by repeated failure by BT to give accurate information on timing of deployment to consumers. Many counted as covered still appear unlikely to receive superfast speeds

owing to the poor quality or length of the copper lines. It is yet to be shown whether and how far BT's development of new technologies such as 'Long Reach VDSL' will improve the situation for those at some distance from a cabinet. (Paragraph 33)

6. Given the nature of the deployment, it is now absolutely essential that BT publishes full broadband speeds and coverage at a premises level, giving full transparency of those who are and who are not receiving superfast speeds so that other providers can, if needed, step in to pick up gaps in coverage. In its current negotiations with BT over the future of Openreach, Ofcom must insist on publication of this data, at the very least, for those BDUK intervention areas which have been covered using public money. (Paragraph 34)

### Connectivity for small businesses

7. It is essential that the Government and Ofcom ensure that SMEs have access to reliable and affordable broadband and are not discriminated against by providers. The Government must prioritise delivering superfast broadband to new and existing business parks and fully connect enterprise zones, many of which still do not have superfast connections. The present system is not working for many businesses and we are concerned that BT is being perversely incentivised not to invest in FTTP in business parks by its present revenue income from dedicated lease lines (Paragraph 38)
8. The broadband connection voucher scheme appears to have been very successful in pooling demand and facilitating better connectivity for SMEs. We share the Minister's enthusiasm for an extension of the scheme and see a strong case for further vouchers to support those businesses in areas not likely to be reached by superfast broadband or affordable commercial products, such as the many small business in remote rural areas in the "final 5%". We regret the ending of the scheme without due notice. This should not be repeated. (Paragraph 42)

### Connectivity in the devolved nations

9. It was an important step to devolve operational responsibility for improving connectivity to the devolved administrations. They have all made good progress despite their more rural and challenging geographies. All three nations have experienced similar challenges and appear to share a recognition of the imperative to drive more investment from the private sector into the UK's telecoms infrastructure. It will be important that DCMS and Ofcom fully involve the devolved administrations in future policy making and the design of future interventions for broadband and mobile, given that a one-sized approach is unlikely to work for all. (Paragraph 47)

### Mobile coverage

10. The Government and Ofcom have worked well together to secure investment from the mobile network operators to achieve agreement on reaching a 90% geographical coverage by 2017. Ofcom has successfully designed spectrum auctions so that coverage obligations are a key part of these exercises. The Government will undoubtedly achieve better coverage for mobile through the release of 700 MHz

band and others once they become available. When these bands are auctioned there will clearly be a trade-off between spectrum price and the obligations on the licence holders. To facilitate investment by the operators, the Government may well need to place additional emphasis on achieving coverage, and on the role that mobile will play in meeting the universal service obligation for broadband, rather than primarily maximising revenue from the auction. (Paragraph 57)

11. Given the progress being made and the undertakings agreed by the mobile network operators in 2014, the Government should, as it has acknowledged, continue cutting red tape, reform the Electronic Communications Code and take further steps to provide a conducive environment to investment, and easy access to fairly-priced backhaul connectivity. (Paragraph 58)

### Reaching the final five per cent

12. We consider that there is an important, but limited, role for satellite provision in meeting the overall challenge of delivering affordable broadband services. Satellite providers are particularly relevant for extreme rural provision, which might incur supplementary costs beyond a potential standard USO tariff structure. They are also relevant for expedient provision to bridge a gap until terrestrial services gradually extend through to most of the premises as yet beyond the BDUK roll out. (Paragraph 65)

### Support for local communities

13. Clearly, in supporting community action in the final five per cent, Government and local authorities will need to consider how best to advertise available solutions to those with poor connectivity. (Paragraph 69)
14. The challenge of reaching the final five per cent is likely to demand the active and willing co-operation of local communities wherever possible. BDUK should offer guidance and support in relation to key areas such as: choosing the right technology solutions, raising finance, stimulating demand and minimising other costs of provision. (Paragraph 70)

### Providing access to backhaul

15. Opportunities for the rollout of fibre to remote nodes should be fully investigated by Ofcom as part of an overall solution for rural connectivity. Access to affordable, reliable backhaul allows communities to benefit from alternative solutions and gives them opportunity to build their own networks such as with B4RN in Lancashire. To assist with deployments, Ofcom should have an important role in overseeing the mapping of national availability of fibre together with a schedule of rates, including suitable spare capacity of public-owned assets. (Paragraph 73)
16. A positive feature of the BDUK gap-funding model is that local bodies receive a refund from BT where there is higher-than-forecast take-up of superfast broadband services. It remains questionable whether the original 20% take-up rate set in these contracts was too low, but the money available for reinvestment will mean that a



significant further percentage of premises will be covered beyond the 95 per cent target. Local bodies must be entirely free to choose how to reinvest this money and to spend it with alternative providers other than BT Openreach, if they consider that as being a more appropriate and cost-effective option. (Paragraph 79)

### Supporting start-ups

17. We agree with Government that a demand-led intervention for bringing connectivity to remote, rural communities is the right way forward for the “final five per cent”. Given the challenge of stimulating demand and covering the costs of accessing backhaul will be a huge barrier to cross for some remote communities, we recommend that the Government evaluate the case for a rural voucher scheme to pool demand and contribute to the cost of backhaul access for network builders (Paragraph 82)

### Towns and cities

18. We consider probably the most effective way of providing access to broadband for those in urban or suburban environments where the market is currently not delivering access is through the introduction of a universal service obligation where a householder would have the legally enforceable right to an affordable and reliable internet connection. (Paragraph 85)

### London Underground

19. Given that London is a world-class city and tourist destination, there must be an expectation now that its principal transport routes have full mobile and internet connectivity. The challenge of providing the London Underground network with connectivity is undoubtedly huge and expensive, but partnerships with private infrastructure groups may be able to facilitate a solution. A quid pro quo for any partner might be special access to the Underground’s passive infrastructure running under London’s streets, which could enable cost reductions and wider network development and upgrades across the Capital. There is also a vital need to improve mobile reception along principal rail routes. (Paragraph 87)

### Right to broadband

20. Rather than introducing two USOs, a single USO should be sufficient to accommodate the typical needs of both residential and small business users, which would facilitate home working. For those businesses that require above average speed connections, it is reasonable that they pay extra for these services, as they do for others such as business banking or other ancillary services. As a USO would be running principally on residential-grade infrastructure it could be complex to operate two fully specified USOs, one for home use and another for SMEs. Although some adjustments could be managed at an exchange level, which could make some differentiation possible, we expect in practice this would likely cause significant technical, operational and commercial challenges. (Paragraph 101)

21. We believe that there is a compelling case for expanding the current USO for telephony and dial-up internet to cover broadband, given the vital role it plays in people's lives through facilitating interactions with friends and family, and commercial and public services. A USO should allow all to have access to decent and reliable broadband services wherever they live. The design of a new USO should be in line with the Government's and Ofcom's aspiration for competition in broadband delivery, both at the service and infrastructure level. Ideally, the USO must be designed so as not to impose too great a burden on industry: to incentivise investment, without creating consumer detriment or overly inhibiting take-up. (Paragraph 116)
22. We support the Government's preference for an industry-funded scheme at this stage. Given that the rollout of superfast broadband has been supported by £1.7bn of public funding and will bring coverage up to nearly 95 or 96 per cent of premises, we believe a demand-led approach is now appropriately funded through a levy on communications providers. Like the history of other utilities, this will involve all users covering—up to an agreed limit—the higher costs of connecting the remaining few who wish to connect. An industry levy in our view could legitimately apply to all communication providers including mobile network operators given that mobile broadband will be part of the solution to delivering a national USO. (Paragraph 117)
23. We believe Openreach would be the obvious backstop provider of the broadband USO in many regions as the owner of the national access infrastructure. Where no provider was willing to bid for the USO undertaking in a particular area, then Government or Ofcom would need to decide whether it would be Openreach or another provider who would meet the obligation and compensate them for doing so through the levy. (Paragraph 118)
24. There will be no advantage in setting the USO's speed and other specifications too high at its introduction, since worthwhile interim solutions to improve connectivity such as wireless solutions may not achieve ambitious data downloads and uploads in certain locations. In addition, a higher specification would force industry to pass on the extra cost to consumers as well as in higher charges, and would also reduce the attractiveness of the providers' retail offers and packages. We believe that the Government is right to follow Ofcom's advice to set it at 10Mbps as a minimum at the start. However, the need for an increase in the USO minimum download speed to 30Mbps by 2022 is entirely foreseeable, and the Government should be making active plans for this eventuality. (Paragraph 119)
25. We recommend setting a single USO for broadband which accommodates the reasonable requirements of both domestic and average small business use, given that delivery is over a residential-grade infrastructure. This would be workable and limit distortions to the commercial broadband markets. The USO's specifications will need to define a range of important factors that affect the experience of household or small business connectivity. As well as download speeds, these factors include minimum upload speeds, maximum delay and maximum error rates. (Paragraph 120)
26. Wherever it is realistic, the Government and Ofcom should ensure that the design of the broadband universal service should use and extend existing commercial and community networks, rather than displacing them. We heard in evidence that it

should be possible to set incentives for Openreach to meet a USO through buying in services from existing infrastructure providers rather than seeking to overbuild them itself. A diverse structure of physical infrastructure competition is clearly beneficial, not least in allowing benchmarking of infrastructure construction costs and exploiting different techniques and technologies. Ofcom and the DCMS should work together as necessary to establish a regulatory framework that promotes diversity within the provision of a USO. (Paragraph 121)

27. In allocation of a USO, an open procurement process should take place where there is transparency and suitably-sized procurement lots to encourage competition among all providers, small and large. Smaller lots appear to suit smaller alternative network providers offering hybrid solutions but we recognise economies of scale and scope can be gained from larger deployments. We envisage Ofcom, or another similar body, taking on an alternative dispute resolution role to arbitrate where disagreements over designation occur. In addition, Ofcom or another body would need to choose the areas to be awarded and run the tendering process. (Paragraph 122)
28. There will need to be a regime in place to conduct periodic reviews of the minimum requirements of the USO and any other conditions attached to it. Those companies bidding would need to be fully aware of the timescales for reviewing the USO and be incentivised to invest in solutions which had a credible upgrade path. Ofcom would need to provide clarity over the likely evolution of the USO standard in line with its ongoing communication market analysis and reviews. (Paragraph 123)
29. Whilst we realise that a USO will take time to implement, given the costs and technical feasibility work that is required as well as the mapping and designation of areas for tenders, we would nevertheless urge Government to introduce the USO at the earliest point, possibly as early as 2018, once the BDUK rollout is due to complete (Paragraph 124)

### A fibre future

30. Given the rise in alternative providers, we agree with Ofcom that the future must be about infrastructure competition as well as service competition. In line with this aim, the Treasury's plan to set up an investment fund for alternative network developers should provide the financial support necessary for network building and enable challenger companies to achieve adequate size and scale to allow them access to low-cost debt which would help enormously to accelerate scaling up of alternative network infrastructure builders in the UK. (Paragraph 135)
31. In the context of driving further fibre deployment, we see the choice facing Ofcom as between satisfying the needs of consumers now, i.e. by maintaining lower prices; or the needs of consumers of the future, by encouraging investment in fibre networks and allowing a pricing freedom to incentivise alternative providers to invest. The price of copper broadband product LLU will no doubt keep a check on the fibre price. Not introducing a wholesale price cap on Openreach's fibre broadband for a while more would allow other providers to continue to make a sufficient return on their investments for further network deployment. (Paragraph 142)

### Access to ducts and poles

32. The requirement of easy access to BT's passive infrastructure on reasonable terms is vital, as it will allow network builders to come to better investment decisions. This issue should have been given a higher priority by Ofcom much earlier. Key to its success will be Openreach providing online access infrastructure maps so that providers can plan their deployments. Pricing will also need to be regulated in a way to encourage investment. Openreach's processes must be realistic and flexible to meet alternative network builders' needs and not just those of BT, and Openreach must demonstrate a willingness to deliver access arrangements that are flexible and encourage take up. (Paragraph 148)
33. Given the lack of progress since 2009 in increasing third parties' access to BT's infrastructure, Ofcom must treat this issue with much more urgency. It should set out a programme of work to facilitate take-up of access to Openreach's ducts and poles facilities by non-BT providers. Access arrangements will need to be supported by an Alternative Dispute Resolution process to resolve any problems, perhaps in line with the mechanisms used to support effective functioning of the Electronic Communications Code. (Paragraph 149)

### Openreach's performance since 2005

34. BT has failed to improve already poor quality levels at Openreach in recent years, while overall investment has remained flat until very recently. For its part, Ofcom was slow to introduce minimum standards of service with financial penalties for Openreach, happening some nine years after its creation. Ofcom regulates for competition, and its charge control regime has kept a downward pressure on prices, so that the UK's communications prices are among the lowest compared with similar EU countries. But this mechanism has not been successful in holding Openreach to an adequate quality of service; and it is an open question how effective overall it has been in stimulating investment in Openreach's infrastructure. (Paragraph 171)

### A new broadband utility

35. There appears to be compelling evidence that BT Group is exploiting the position of vertical integration to make strategic decisions that favour the Group's priorities and interests, at the expense of its access infrastructure business. BT does not lack access to capital. Its current structure allows it to use Openreach's utility-type assets to cross-subsidise riskier activities elsewhere in the Group, while significantly under-investing in Openreach. (Paragraph 186)
36. It came as a surprise to us that BT employs an investment hurdle rate significantly above Openreach's actual cost of capital, as estimated and allowed for by Ofcom. At the same time, BT's use of an investment hurdle rate which is 1.6% above Openreach's cost of capital means that a potentially very significant amount of annual investment in broadband access and services, investment that would add to shareholder value, is not made. While we understand the desire for BT and other providers to balance infrastructure investment with their own commercial interests, this forgone investment in maintaining, upgrading and supporting Openreach's infrastructure

is damaging both to public welfare, to shareholders and to consumers. We believe there is a pressing need to liberate more of Openreach's revenue for investment in broadband and the evolution of its telecoms infrastructure. As a result there is a need to consider closely BT's governance and capital structures as well the adequacy of its oversight and regulatory arrangements. (Paragraph 187)

37. On the evidence presented, it seems very likely that Openreach would invest more in upgrading its infrastructure if it were a separate company, since it would not be competing with other Group businesses and would be freed from the Group hurdle rate on investment. By adopting its current approach, BT is likely to be sacrificing shareholder value and public benefits that would flow from these investments. This is likely to mean that substantial amounts of money—potentially totalling hundreds of millions of pounds a year—are not being invested in developing and upgrading Openreach infrastructure which is critical to the UK economy and most people's lives. We therefore recommend that Ofcom undertakes an assessment to ascertain the financial effect of BT's failure to invest in Openreach at its true cost of capital. (Paragraph 188)
38. We have considered the case made by Professor Helm for establishing a standalone broadband utility provider using a regulatory asset base model. While the concept of having a single system operator could be conducive to the management of a universal service obligation for broadband, we believe the differences between the communications market and other traditional utility markets are too great. There is already a wide level of competition in the communications access infrastructure market, and real potential for this to grow. It is not clear to us how the presence of a utility-style operator would be compatible with promoting competition or would work successfully alongside current market players such as Virgin Media, to say nothing of the many other smaller providers of broadband access infrastructure, without stifling competition and the growth of alternative networks. We also consider that there is a significant risk of disruption to investment in and by Openreach, were BT forced into a structural separation. (Paragraph 201)

### An independent Openreach?

39. Ofcom set out a very cogent case in its Digital Communications Review for full separation of Openreach from BT Group, yet it stopped short of making an outright recommendation for such action at that stage given concerns over difficulties of implementation, possible disruption to investment and likely response by BT. It is a very difficult judgment call as to whether the benefits of full structural separation would outweigh the likely significant disruption and fall-out to the wider industry and consumers. However, there is good reason to suggest that a more independent Openreach might increase infrastructure investment significantly. (Paragraph 202)
40. We consider Ofcom has been right not to rule out full separation; that option should be kept firmly on the table. Ofcom has said that the proposals BT has made to date on governance, performance, status and other arrangements of Openreach have not gone far enough. In our judgment Ofcom must remain resolute in its negotiations with BT to ensure the reform necessary to establish the quality and availability of communications services needed for UK consumers and businesses is delivered. If

the regulator were to place more emphasis on Openreach's quality of service—an area which Sharon White admitted has been comparatively ignored until now—BT would voluntarily invest more in the infrastructure to avoid significant penalties. Should BT fail to offer the reforms and investment assurances necessary to satisfy Ofcom's and our own concerns, then the regulator will need to set in train the steps to enforce full separation of the Openreach business. (Paragraph 203)

41. In any event, in order to cement Openreach's independence, we recommend that in future Openreach should be required to set out and publish a five-year strategic investment plan for comment and agreement with the BT Group Board. This would enable it to set out its financial needs, in a transparent and comprehensive manner. Should Openreach remain part of the BT Group under a strengthened model of functional separation, BT should be obliged to allow Openreach to raise finance independently in the capital markets in its own right, and to make investments that meet the business's own cost of capital. We have every reason to believe that Openreach would be a very attractive investment vehicle to longer-term institutional investors, who could in turn facilitate increased investment in infrastructure. (Paragraph 204)
42. Throughout this inquiry, it has been very clear that the communications sector is characterised by bad internal relations between its main players. With the exception of areas such as technical standards and disaster recovery there has been little co-operation between competitors. This is regrettable because there are other areas—such as training and skills—where more open discussion and co-ordination would benefit the whole industry and its customers. We understand that the industry will continue to be driven by competition, but we are disappointed by companies' frequent recourse to litigation and failure to adopt a more cohesive approach. (Paragraph 205)

# Annex: Specialist Advisers' advice to the Committee

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## Investment in superfast broadband: Regulation, competition and the cost of capital

**A joint paper to the Committee by Tim Jenkinson,<sup>1</sup> Tony Lavender,<sup>2</sup> Jim Norton<sup>3</sup> and Helen Weeds,<sup>4</sup> 7 July 2016**

### I. Introduction

1. We have been asked to assist the Culture, Media and Sport Select Committee of the House of Commons in its inquiry into “Establishing world-class connectivity throughout the UK”. This advice focuses on investment in superfast broadband, especially the impact of regulatory treatment of investment, the role of competition and questions related to the cost of capital.
2. The rest of this report is structured as follows. Section II outlines the need for broadband investment, noting recent demand growth, and describes the available technologies for providing superfast and ultrafast broadband services. Regulatory treatment of investment is explained in Section III, which sets out the RAB model and examines its application to the communications sector. Section IV discusses the role of competition. Section V compares Ofcom’s assessment of Openreach’s cost of capital with the hurdle rate used in Openreach’s capital budgeting and discuss implications of this and Openreach’s structure for investment in local access infrastructure. Section VI concludes.
3. This report was drafted prior to the referendum on the UK’s membership of the European Union held on 23 June 2016. It takes no account of the outcome of the referendum or its implications for the UK communications sector or wider economy.

### II. The need for broadband investment

4. Demand for broadband services has increased considerably over the past few years. This appears as both an increase in demand for connections capable of supporting high speed broadband services and an increase in the data traffic demand from these connections. The driver of demand is access to an increasing set of content and applications for both consumer and business purposes. Of these applications the biggest generator of data traffic is increased demand for video (e.g. YouTube, BBC iPlayer and others).
5. Ofcom (2015a) states that:
  - The number of fixed residential and SME broadband lines in the UK has risen from 22.8 million at the end of 2013 to 23.7 million at the end of 2014.

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4 Dr Helen Weeds, University of Essex and Multimedia Economics Ltd.

- The proportion of adults with broadband (fixed and mobile) has risen from 77% (Q1 2014) to 80% (Q1 2015).
- Take up of superfast fixed broadband (defined as providing speeds of 30Mbps or higher) has risen from 23.2% (end 2013) to 30.0% (end 2014) of broadband connections.
- Superfast fixed broadband lines have risen from 5.3 million (end 2013) to 7.1 million (end 2014).
- Average superfast broadband speed has increased from 17.8Mbps (November 2013) to 22.8Mbps (November 2014).

6. Fixed broadband services are available from a number of suppliers in the UK. The major retail players are BT, Virgin Media, Sky and TalkTalk. Virgin Media provides its services through its own cable network infrastructure. Other major players use wholesale local access services provided by Openreach (e.g. unbundled local loops and VULA<sup>5</sup>). In addition, there are builders of new fibre infrastructure including CityFibre and Gigaclear.

7. Use of mobile broadband has increased with the introduction of 4G LTE services. According to Ofcom, in Q1 2015, 61% of adults in the UK were using their mobile handset to access the internet. As LTE rollout increases across the UK, mobile becomes capable of supporting a wider range of high bandwidth applications creating a degree of substitutability between fixed and mobile broadband services.

### ***a. What sort of speed and capacity do people require?***

8. There is a tendency to focus on speed as the main metric for describing broadband performance. While important, speed does not tell the entire story and there are other aspects of service performance to take into account, particularly the capacity offered to users. This is often represented as a monthly amount of data (e.g. 20 gigabytes) that consumers can use. The consumption of services such as high definition TV can quickly require large amounts of capacity.<sup>6</sup>

9. Broadband Stakeholder Group (2013), a report on domestic demand for broadband, suggested that a median household would need a speed of 19Mbps by 2023 and that the top one percent of households would need 35–39Mbps. The BSG has also considered business broadband speeds and it suggests that small business connectivity requirements will increase from a median downstream speed of 5Mbps to 8.1Mbps between 2015 and 2025 and the downstream speed required for the 95th percentile of small businesses rises from 12.9Mbps in 2015 to 41.1Mbps in 2025. The BSG also highlights the Importance of upstream speeds for small businesses and that more than 50% of businesses will require an upload speed of more than 1Mbps.

10. Ofcom (2016a) (“the DCR”) paints a similar picture. However, it also notes that there are many residential consumers and business who would like access to superfast broadband services but are currently unable to access them.

11. To address premises with no or poor broadband service the Government announced a consultation on a broadband Universal Service Obligation (USO) in November 2015.

5 Virtual unbundled local access (VULA) is the local access product used to provide superfast broadband.

6 A high definition (HD) film of two hours duration can require up to 4.5 gigabytes of download.



Ofcom has been commissioned to provide technical analysis and recommendations to support the design of the broadband USO. The proposed download speed for the broadband USO is 10Mbps.

### ***b. What is the capability of current solutions?***

12. Solutions to deliver fixed broadband services could utilise existing copper assets, fibre, wireless or satellite technology. Much of the broadband provision in the UK today is based on use of BT's legacy copper assets.

#### ***Copper***

13. There are two main copper based solutions in use:

- Copper lines providing a direct connection from the exchange to the premise that use asymmetric digital subscriber line (ADSL) technology. These can typically support download speeds of up to of 17Mbps. ADSL connections provide the majority of broadband access in use today.
- Fibre to the Cabinet (FTTC) uses very-high-bit-rate digital subscriber line (VDSL) technology over copper loops from the cabinet. These copper loops are generally shorter than those from the exchange and are capable of supporting higher data speeds. FTTC solutions deployed by Openreach can currently support speeds of up to 76Mbps.

Note that not all users will achieve the speed shown above as the actual speed achieved is dependent on the loop length and the quality of the loop.

#### ***Cable***

14. Cable broadband access is based on a technology called DOCSIS3.0<sup>7</sup> This technology, as deployed by Virgin Media, is capable of supporting data speeds of up to 200Mbps. It is available where Virgin Media has rolled out cable infrastructure.

#### ***Fibre to the premises***

15. Fibre to the premises (FTTP) solutions can potentially support very high data speed of 1Gbps or more. For example, Gigaclear offers a number of home broadband packages with speeds ranging from 50Mbps up to 1Gbps download.

#### ***Fixed wireless access***

16. Fixed Wireless Access (FWA) solutions can provide good broadband access although these systems do have limitations, especially for higher data speeds and high capacity use. An example of FWA deployment is Relish,<sup>8</sup> which will support data speeds of up to 50Mbps.

<sup>7</sup> DOCSIS refers to a technical standard called Data Over Cable Service Interface Specification.

<sup>8</sup> Relish is currently deployed in Central London. Figures refer to Relish's home unlimited product. Relish is operated by UK Broadband, which is part of Hong Kong-based telecoms group PCCW.

## Satellite

17. Satellite systems are capable of providing access to areas where fixed or terrestrial wireless access systems are not available for providing broadband service. They are capable of supporting download speeds in the range 15Mbps to 20Mbps but the current generation of products can be expensive for provision of high capacity service.

### *c. Future developments for copper based services*

18. There are two strands to future development of copper based services:

- G.Fast is a new technology solution which allows very high data speeds to be delivered over short copper loops. It will generally require fibre to be present closer to the premises than in FTTC installations. G.Fast equipment will be located at either the pole that feeds the last length of copper to the premises or at the equivalent underground connection point. It has potential to deliver speeds of up to 1Gbps on loops of less than 100 metres. In March 2016 BT announced a G.Fast trial that will deliver speeds of initially 330Mbps rising to 500Mbps in future. BT announced at its capital markets day<sup>9</sup> a commitment to ten million homes passed by G.Fast by 2020.
- Performance of longer copper loops is an issue especially, but not exclusively, for premises in rural areas. There are also issues in some cities with premises served directly from an exchange without an intervening cabinet. A number of solutions are possible using ADSL and VDSL technology. According to ISP Review (2016), BT is currently working on a long reach VDSL technology solution, which uses higher powers and more frequencies than conventional VDSL FTTC solutions. While firm technical details have yet to be announced it is anticipated that this technology could potentially offer up to 20Mbps at a loop length of 2km. It is a potential solution for meeting the Government's proposed broadband USO.

### *d. Ultrafast broadband services*

19. Ofcom signalled in the DCR that it will make a strategic shift to encourage deployment of new ultrafast networks, including fibre direct to homes and businesses, as an alternative to copper based technologies currently being planned by BT.<sup>10</sup> Ofcom believes that the UK is behind some other countries with deployment of such services.<sup>11</sup> Ultrafast, which is defined as offering speeds of greater than 300Mbps, is generally taken to mean FTTP. However, it is possible that ultrafast speeds could be delivered by G.Fast technology over very short loop lengths in future. Future upgrades to DOCSIS could also potentially deliver ultrafast speeds.

9 Openreach presentation at BT Capital Markets Day held on 5 May 2016. <http://www.btplc.com/Sharesandperformance/Quarterlyresults/2015-2016/Q4/Downloads/Slides/CapitalMarketsDay-Session2.pdf>

10 Ofcom (2016a), Section 4.

11 Ofcom (2016a) states that FTTP was forecast to reach around 2% of UK premises at the end of 2015 and that global leaders such as South Korea and Japan had reached 63% and 70% respectively at the end of 2015.

20. Fibre investments are being made, for example, by Hyperoptic, CityFibre, Gigaclear and Virgin Media (under Project Lightning<sup>12</sup>). BT has also announced an “ambition” for one million businesses to have ultrafast available by 2020 and for one million homes passed in the same time frame.

### III. Regulatory treatment of investment

21. In his written evidence to the Committee, Professor Dieter Helm discusses the steps needed to establish Openreach as “the broadband utility”, separate from the rest of BT Group. Helm’s third step, after a CMA reference to bring about separation and defining a licence for the broadband utility, is that:<sup>13</sup>

“The duties of the regulator—in particular in respect of the financing of functions—would need to be defined. Again there is lots of experience, and again Ofcom does not address this issue [in its DCR], and the related ones of protecting investors’ investments through its regulated asset base.”

#### a. The RAB model

22. As Helm explains in a 2009 paper,<sup>14</sup> the concept of a regulated asset base (RAB) was introduced into the UK’s “RPI-X” price cap system of utility regulation as a means of protecting capital investments made by the regulated company. Under RPI-X, there is a danger that past investments may be effectively expropriated by the regulator at the next periodic review by re-setting regulated prices at a level that covers operating costs but does not allow a return on these assets. Fearing such treatment, and given that investments are typically sunk (i.e. cannot be reversed and their costs recovered in full), the investment will not be forthcoming in the first place.

23. The RAB provides the regulated company with a form of guarantee reducing the risk of such ex post exploitation of its monopoly network assets.<sup>15</sup> Although not mentioned in the statutes governing UK utility regulation, the RAB has a legal underpinning of sorts in the form of the regulator’s financing duty, mentioned by Helm in the quotation above. Regulators have a duty (amongst others) to have regard to the regulated firm’s ability to finance its regulated functions. However, unlike the alternative “rate of return” system of utility regulation traditionally applied in the USA,<sup>16</sup> the financing duty does not legally enshrine full cost recovery and a guaranteed rate of return on investment.

24. In each regulated utility sector the methodology for establishing the RAB and adjusting its value over time, as new assets are built and old ones depreciated, has developed through a process of consultations and published principles, giving investors a

12 Virgin Media (2016).

13 Helm (2016), paragraph 20.

14 Helm (2009), Section 2.3.

15 The role of the RAB as a regulatory commitment device is discussed in greater depth in Stern (2014).

16 In US-style rate of return regulation the regulated firm has a legally-enshrined right to recover its costs, including an allowed rate of return on capital, which is enforceable through the courts. There is some evidence that the cost of capital is lower under rate of return regulation than under price caps: see Alexander, Mayer and Weeds (1996).

high degree of certainty over how the company's assets will be treated. Despite the absence of a statutory basis, the RAB is supported by the regulator's concern for maintaining its own credibility as well as the companies' rights of appeal in regulatory reviews.<sup>17</sup>

### ***b. Applying RAB to the communications sector***

25. Turning specifically to regulation of the communications sector, the underpinning of the RAB is a little different from the other UK utilities.<sup>18</sup> Ofcom does not have a financing duty as such; however, in carrying out its duties Ofcom is required to have regard to (among other things) the desirability of encouraging investment and innovation in relevant markets.

26. In practice, when setting price controls Ofcom has acted in a similar way to the other utility regulators in its approach to asset valuation and depreciation. Openreach's pre-1997 copper access network assets are given a "regulatory asset value" (RAV) based on their historic cost accounting (HCA) value.<sup>19</sup> For post-1997 assets Ofcom applies current cost accounting (CCA) principles,<sup>20</sup> with financial capital maintenance to ensure that there is the opportunity to recover efficiently incurred costs. For example, in the fixed access market reviews setting cost-based price caps for local loop unbundling (LLU) and wholesale line rental (WLR),<sup>21</sup> Ofcom uses current cost accounting fully allocated costs (CCA FAC) to assess the cost base, with a "RAV-adjustment" for the HCA value of pre-1997 local access ducts. Ofcom's cost assessments include an allowance for a return on capital, measured at the firm's cost of capital (this is discussed further in Section V).

### ***c. New products and services***

27. Innovative products and services based on new technology involve high up-front risk of failure. Given the fast pace of technological change in the communications sector, this issue is particularly pressing here. For innovative products Ofcom recognises that, while there is potential for excessively high prices, this concern may be less important for consumers than the need to ensure that the innovation and related infrastructure investment takes place in the first place. Given that a product which fails earns a low or even negative return,<sup>22</sup> it may be necessary to allow high returns on new products that turn out to be successful in order to ensure that the ex ante expected return covers the cost of capital and the investment takes place.

28. To this end Ofcom has adopted a "fair bet principle", stating:<sup>23</sup>

"An investment is a 'fair bet' if, at the time of investment, expected return is equal to the cost of capital. This means that, in order to ensure that an investment is a fair bet, the firm should be allowed to enjoy some of the upside

17 Under the relevant legislation the regulated companies have a right of appeal against regulatory price reviews to, variously, the Competition and Markets Authority or the Competition Appeal Tribunal.

18 Joint Regulators Group (2013), Section 2. Ofcom's statutory duties are set out in the Communications Act 2003.

19 Ofcom (2005a).

20 See, for example, Ofcom (2013).

21 Ofcom (2014), Volume 2: LLU and WLR Charge Controls. See also Annexes 11–13 (cost modelling).

22 This presumes that the regulator cannot provide full cost recovery (including a reasonable return on investment) for innovative investments that do not succeed.

23 Ofcom (2013), paragraph 2.39.

risk when demand turns out to be high (i.e. allow returns higher than the cost of capital) to balance the fact that the firm will earn returns below the cost of capital if demand turns out to be low.”

29. While the fair bet principle may allow an apparently high return in instances where risky investments turn out well, the intention is nonetheless that expected returns do not exceed the cost of capital when viewed (properly) at the commencement of the project rather than in its outturn.

30. At the present time Ofcom applies the fair bet principle to superfast broadband. VULA, the local access product used to provide superfast broadband, is not subject to a charge control capping the level of prices set by Openreach (although it is subject to other measures intended to prevent discrimination between BT’s downstream businesses and other Openreach customers). Thus the VULA price is currently not set according to the RAB valuation principles described above. Note that this is in the interests of the regulated firm’s investors as it protects them from asymmetric risk: the “heads I win, tails you lose” effect that arises when the regulator caps prices for successful products.

31. However, regulatory forbearance is unlikely to be open-ended. A cost-based charge control may well be imposed on VULA in the future, perhaps as soon as the next market review in 2017. At this point the RAB principles will come into play for VULA, in the same way as they apply to many other areas of Openreach’s activities.

#### ***d. Introduction of competition***

32. The introduction of competition may pose a challenge to the RAB model as a means of guaranteeing recovery of investment costs (including a reasonable return on capital). If consumers switch to rival products in sufficient numbers, some of the incumbent’s assets may unexpectedly be rendered obsolete (or “stranded”). As competition grows, the regulator’s ability to ensure full cost recovery may become constrained: if costs are passed on in the form of higher prices elsewhere, this raises the risk of undercutting by competitors in those areas too.

33. Besides, guaranteeing full cost recovery for the incumbent would tilt the competitive playing field against entrants. Even if it were possible to extend a similar guarantee to other players—difficult to envisage since these are unregulated—public underwriting undermines incentives for firms to be efficient or to undertake careful assessments of their investments, making this undesirable.

34. The impact of competition on regulatory commitment under the RAB is not unique to the communications sector. Writing in relation to the proposal by water regulator Ofwat to introduce competition into that sector, Nourse (2009) recognised that the regulator could not guarantee a return in such circumstances:

“Investors do not expect Ofwat to provide a ‘silver bullet’ to take away the risk of regulatory change from the current reviews. It is recognized that Ofwat could not say something like ‘We guarantee that as a result of all this competition stuff, we will not touch £1 of RCV [regulatory capital value].’” [Emphasis in the original.]

35. In the communications sector there is actual and potential competition in the local access network. It is not a natural monopoly. Openreach competes with Virgin Media for nearly half of households, faces emerging fibre-based operators such as CityFibre and Gigaclear in some areas, and there is also the possibility of convergence with mobile data services. BT can and does lose demand to competitors that use their own local access infrastructure, in which case BT and Openreach earn no further revenue from these customers.

36. Regulated incumbents in the communications sector sometimes complain that they are required to grant their competitors a “free option” to use the regulated assets while they wish and then walk away when a new technology comes along or they choose to make their own investments. While incumbents occasionally use this argument to request a higher return on such assets as an “option premium”, regulators have been reluctant to grant up-front remuneration (e.g. via a front-loaded depreciation profile) to offset the risk of stranding.

37. The possibility of licensing a single operator of local access infrastructure—as Helm appears to assume in his written and oral evidence to the Committee—might help to protect the licensee from asset stranding due to competition, but runs contrary to current industry developments which foresee increasing competition from a variety of technologies. Moreover, licensing a monopoly provider would conflict with Ofcom’s stated aim of fostering competition in local access infrastructure. In her evidence to the Committee,<sup>24</sup> Ofcom CEO Sharon White stated that the regulator foresees that around 40% of the country could have real network competition, with a minimum of three competing access providers, the shift occurring over the next ten years. Ofcom has stated that it prefers to use competition to drive investment in network upgrades.<sup>25</sup> Ofcom’s approach of regulating for competition is discussed next.

## IV. The role of competition

38. In contrast with other regulated utilities, the communications sector has no clear dividing line between “natural monopoly” and “potentially competitive” activities. Competing infrastructure is present in many parts of the industry. Even the “last mile” between the customer premises and BT’s exchange—traditionally viewed as monopolistic—faces existing and growing competition in parts of the UK: Virgin Media’s network currently passes 44% of UK premises<sup>26</sup> and is set to expand to around 60% of premises, and new providers such as Gigaclear and CityFibre are laying fibre access lines in some areas of the country.

### a. Regulation for competition

39. Ofcom’s approach to regulating the sector balances two objectives: preventing the exploitation of market power and promoting competition where this is feasible and desirable. Ofcom’s approach of regulating for competition has two distinct elements. First, with BT being a vertically integrated firm combining inputs that confer significant market power (mostly operated by Openreach) with wholesale and retail divisions that operate in competitive markets, Ofcom polices the essential inputs that are used by BT’s competitors

24 Sharon White, Oral evidence, 12 April 2016, responses to Q946 and Q947.

25 Ofcom (2016b).

26 Ofcom (2015a).

as well as its own downstream divisions. Secondly, Ofcom aims to promote the expansion of competition into parts of the network that previously were monopolised. For example, local loop unbundling (LLU) helped to stimulate investments by alternative operators (primarily TalkTalk, Sky and Vodafone) in infrastructure connecting up to BT exchanges.

40. However, there is a difficult balancing act to be performed between the two objectives. In facilitating third party access at one point in the network—e.g. at the BT exchange—in order to promote competition in markets downstream of this stage, there is a danger that investments which go deeper into the network—in local access infrastructure itself—are discouraged. The “make or buy” decisions of rival operators are profoundly affected by regulatory decisions.

### ***b. Functional separation***

41. Functional separation of Openreach in 2005 was intended to achieve two main aims. By allowing BT’s rivals to purchase the same products, using the same processes and systems, as BT’s own businesses, “equivalence of input” extended the principle of non-discrimination to non-price aspects of service. Secondly, it was hoped that by requiring BT itself to use the same products and processes as its rivals, this would generate internal pressure for Openreach to improve their quality, delivery times and reliability.<sup>27</sup>

42. The first aim has been achieved, albeit with the loss of some vertical efficiencies. Alongside a cut in the wholesale price for LLU in 2005,<sup>28</sup> functional separation helped drive uptake of LLU by BT’s retail competitors (especially Sky, which acquired broadband provider Easynet the same year, and TalkTalk), thus stimulating their infrastructure investments to connect to the exchange.

43. However, the evidence presented in the DCR demonstrates that the second aim has failed. Despite serving BT itself as a major customer, Openreach has failed to improve its quality of service. Openreach appears instead to have adopted the well-established strategy of a price-regulated monopolist of raising its profits by compromising quality.<sup>29</sup>

44. Ofcom is now adopting explicit quality of service regulation. Ofcom has powers under the Communications Act 2003 to impose financial penalties on BT should it fail to meet its regulatory obligations, and has recently published updated penalty guidelines.<sup>30</sup> In the past two years Ofcom has adopted the approach of including minimum performance standards as part of its market reviews.<sup>31</sup> In the DCR Ofcom sets out its intention to impose tougher minimum quality of service standards on Openreach, with substantial fines for failure to meet these standards.

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27 Ofcom (2004). In paragraph 6.13 Ofcom lists among the advantages of equivalence of input that “[i]t generates better incentives to BT to improve the products it offers to its competitors”.

28 Ofcom (2005b).

29 In belated recognition of this incentive, the Competition and Service (Utilities) Act 1992 gave the telecoms and gas regulators powers to set minimum performance standards, collect and publish quality of service data and set up customer compensation schemes. Sections of the Act relating to telecommunications have since been repealed by the Communications Act 2003.

30 Ofcom (2015b).

31 In written evidence to the Committee (Ofcom, 2016b), Ofcom states that in June 2014, in its Fixed Access Market Review Statement (Ofcom, 2014), it for the first time imposed a range of minimum performance standards on Openreach, and adopted a similar approach in its Business Connectivity Market Review Statement in April 2016.

### **c. Access to ducts and poles**

45. Ofcom is now looking to extend its approach of regulation for competition to the local access network itself. As part of its measures to encourage fibre investment and increase availability of competing ultrafast broadband services, Ofcom's DCR proposes to facilitate rivals' access to BT's ducts and poles, known as physical infrastructure access (PIA). Although BT has been required since 2011 to publish a reference offer for PIA and meet reasonable requests on cost-oriented and non-discriminatory terms, evidence submitted to the Committee indicates that uptake has been negligible. Many details remain to be fleshed out, and international experience of PIA is somewhat mixed.

46. Improved access to BT's ducts and poles should reduce the costs of fibre investment for BT's rivals,<sup>32</sup> stimulating competitor investment in local access infrastructure. The heightened threat of competitor investments should also prompt BT to expand its own investment programme: rather than sweating its copper assets, which will become redundant in any case, BT will have a greater incentive to invest in fibre. If the PIA regime can be made effective, it could promote widespread, competing fibre networks.

### **d. Regulatory approaches to fibre**

47. In its regulatory decision-making, Ofcom frequently faces a trade-off between conflicting effects on BT's and its competitors' investment incentives, or towards investment in different parts of the network. High prices for fibre relative to copper access products—as is seen currently with regulatory forbearance towards VULA while LLU is subject to cost-based charge controls—stimulates fibre investment at the local access level by BT and other providers, but dampens competing retailers' efforts to promote superfast relative to standard broadband products.

48. BT's vertically integrated structure generates another trade-off. BT argues that having its own retail division as an “anchor tenant” enables it to make risky fibre investments. However, the counterpart to this is that competing fibre providers—such as CityFibre and Gigaclear—find it harder to invest as they can access only 40–50% of superfast broadband customers through wholesale contracts with retailers (presuming that the vertically integrated BT and Virgin Media retail divisions will not sign up with them).<sup>33</sup>

49. If successful, fibre rollout will raise further issues. Will BT be permitted to remove its copper, and if so when? In the long run it is inefficient to maintain both copper and fibre networks, but removal of copper will eliminate the backstop from competing (albeit lower quality) copper-based products which place some constraint on the pricing of superfast broadband. Ofcom states in the DCR that where network based competition is effective it will deregulate downstream forms of network access:<sup>34</sup> how many competing access providers will this require? On these and other questions, Ofcom will need to make its intentions clearer in time.

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32 In her evidence to the Committee, Ofcom CEO Sharon White stated that, based on the experience of Portugal and Spain, duct and pole access can reduce the cost of getting to the premises by about 40% (Sharon White, Oral evidence, 12 April 2016, response to Q943).

33 In a pilot project in York, CityFibre has teamed up with Sky and TalkTalk as investment partners.

34 Ofcom (2016a), paragraph 8.19.



## V. Openreach's cost of capital and investment

50. As part of the RAB model described in Section III, an important element is the cost of capital that the regulator includes as part of the regulated firm's costs when setting price controls. The market cost of capital, the rate allowed by the regulator and the regulated firm's approach to capital budgeting are important influences on the firm's investment behaviour. This is discussed next.

### a. Ofcom's assessment of Openreach's cost of capital

51. In setting price controls the regulator has to estimate an appropriate cost of capital that allows investors an expected rate of return that is commensurate with the risks of the business. In the case of BT, Ofcom estimates the weighted average cost of capital (WACC)<sup>35</sup> for the overall group using market data, and also provides disaggregated estimates of the cost of capital applicable to Openreach and the "rest of BT".<sup>36</sup> The cost of capital is periodically reviewed to reflect changes in financial markets: Ofcom's latest estimates are 9.9% for BT Group, 8.8% for Openreach and 12.4% for the rest of BT.<sup>37</sup> The lower cost of capital for Openreach reflects the relatively stable, non-cyclical nature of the access network business compared with BT Group's other activities.

52. The estimates produced by Ofcom for the disaggregated cost of capital appear to us reasonable and in line with those estimated by other regulators and private companies. In evidence submitted to the Committee Ofcom compares its estimate of Openreach's WACC on a like-for-like "real vanilla" basis (4.0%) with those estimated by Ofgem (3.8%) and Ofwat (3.7%) for the energy and water sectors respectively.<sup>38</sup>

### b. Openreach's capital budgeting approach

53. One of the more surprising pieces of evidence heard by the Committee was that BT does not internally mimic the Ofcom approach in requiring different rates of return on investments in different parts of its business. BT uses its estimate of a 10.4% group cost of capital for all investment projects, even though the risks involved will differ markedly between Openreach and other parts of the group. In evidence to the Committee, BT justified this approach as follows:<sup>39</sup>

"Openreach does not have its own capital structure or debt. Financing is raised at BT Group level rather than at the Openreach level. As such, it is not possible to calculate a specific cost of capital for Openreach alone. This would involve having to make subjective assumptions such as how much Group debt should be allocated to Openreach and what 'beta' to apply in the Capital Access [sic] Pricing Model."

35 The WACC incorporates the costs of different categories of capital, primarily debt and equity.

36 See, for example, Ofcom (2014), Annex 14 (cost of capital) and Annex 15 (Brattle Group report estimating BT's equity beta).

37 Ofcom (2016b). All these cost of capital estimates are on a pre-tax, nominal (i.e. including inflation) basis.

38 Ofcom (2016b).

39 BT (2016).

54. Many businesses face such issues in varying degrees, and it is normal practice to estimate the relative riskiness of the different activities and use a lower required return for the less risky investments relative to the riskier investments. Failing to allocate capital on this basis is likely to reduce shareholder value.

55. It is certainly the case that measuring relative risk, and required return, at the business level within an integrated group faces certain measurement and conceptual issues. But these are not insurmountable. Ofcom produces such estimates (for instance, assuming that the debt raised by BT is spread pro-rata across Openreach and the rest of BT), and it is unclear why BT eschews this approach in its internal capital allocation decisions.

56. By requiring a higher rate of return (10.4%) than the estimated cost of capital for Openreach (8.8%) BT will, inevitably, reduce investment in Openreach to below optimal levels in this part of the business. Profitable projects whose expected return falls between these rates will not be pursued. Ironically, shareholders, as well as BT's customers, should welcome higher levels of investment in the local access network.

57. When the rate of return allowed by the regulator is below the cost of capital considered by the firm, the situation may be worse still. In the reverse of the "Averch-Johnson effect" found in US utilities subject to rate of return regulation,<sup>40</sup> the firm may be expected to under-invest in capital assets, preferring instead to make greater use of other inputs that are fully compensated by the regulator. On this view, Openreach would wish to invest as little as possible in its network, or at least to invest only in projects where it believes it can make efficiency gains not anticipated by the regulator (and hence achieve the 10.4% hurdle rate despite Ofcom's expected 8.8% return).

58. This decision by BT to allocate capital between its various businesses on the basis of a single group-wide hurdle rate is bound to lead to sub-optimal investment in (relatively low-risk) Openreach. Estimating the magnitude of this investment shortfall would require additional analysis, with considerable data requirements concerning the investment opportunities available to BT and their associated costs, but is likely to be substantial and could perhaps even run into the hundreds of millions of pounds. By adopting this approach BT is likely to be sacrificing shareholder value and, with this, the public benefits that would flow from these investments.

### ***c. How can Ofcom encourage Openreach to invest?***

59. It is challenging for Ofcom to regulate investment in the access network. The investment programme is made up of a large number of relatively small capital projects, and the regulator is not in a position to micro-manage this programme. Ofcom could encourage BT to "invest more", but the ultimate goal is not investment per se but a better outcome for customers in terms of quality, speed, resilience, service levels, etc. Regulating inputs (capital expenditures) is generally less effective than giving incentives on outputs (the customer experience).

60. In this regard, the approach adopted by Ofcom to date has been to hope that functional separation would encourage Openreach to invest to improve quality of service. As discussed in Section IV, this approach has not had the desired effect and Ofcom is

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<sup>40</sup> Averch and Johnson (1962). According to Averch and Johnson, utilities whose allowed rate of return exceeds their cost of capital over-invest in capital, resulting in "gold-plating" of assets.

now adopting explicit quality of service regulation, with the threat of substantial fines. By increasing the penalties for poor quality of service, lowering BT's profit if it fails to improve, the relative returns to investments in the access network will be increased. Thus the impact of an enhanced quality of service regulation regime would be to increase the return earned by BT on investments undertaken by Openreach, stimulating investment.

#### ***d. Financing of investment***

61. Increased investment in the local access network needs to be financed. This additional funding could come from shareholders or lenders. BT's ability to raise debt and equity finance to help fund its acquisition of EE suggests that financial resources and flexibility are readily available to it. While BT will of course be mindful of its credit rating, its relatively low gearing suggests that it might be able to finance an increased level of investment in the local access network simply by taking on some additional borrowing.

62. BT's current policy is to raise financing at the group level. However, other options exist: it should be possible, even without legal separation, to raise debt against the revenues earned by specific assets (such as the access network). While Openreach remains part of BT, however, it forms part of the group's equity: it cannot issue shares itself and its borrowing will affect the cost of group equity.

#### ***e. Separation of Openreach and the cost of capital***

63. The question of the impact of structural separation on Openreach's cost of capital generates mixed opinions: BT claims that separation would increase the cost of capital, while Dieter Helm argues that separation would facilitate a licensed utility structure that would benefit from a low cost of capital.

64. In his oral evidence to the Committee<sup>41</sup> BT CEO Gavin Patterson claimed that, as part of BT Group, Openreach benefits from access to the balance sheet of the wider group. With its substantial capital assets and large, stable cashflow the financial position of a separate Openreach would in any case be strong. Besides, the disclosure that BT uses a common hurdle rate across all of its businesses suggests instead that it is BT's riskier lines of business that gain from group operation at the expense of relatively low-risk Openreach. The mismatch between the hurdle rate and the actual cost of capital for each business area has the effect of misdirecting capital away from lower risk activities (e.g. Openreach) and towards riskier ones.

65. BT provided a recent (April 2016) survey of institutional investors<sup>42</sup> in support of its view that a separate Openreach would experience a higher cost of capital than an integrated BT. Of the 26 respondents who gave an opinion, 15 thought that a separated Openreach would have a higher cost of capital, six thought the cost of capital would be lower, and five thought it would be unchanged. We do not view this survey as decisive evidence: we note both the relatively small sample size and the fact that all of those surveyed were against structural separation, perhaps because of its other implications,<sup>43</sup>

41 BT, Oral evidence, 15 March 2016 (HC407), response to Q801.

42 Brunswick Insight (2016).

43 Notwithstanding Ofcom's efforts to constrain this, BT's control over key inputs that are also used by its competitors gives it some ability to favour its own downstream businesses. This discrimination benefit of vertical integration, as well as potential vertical efficiencies, may explain why BT and its investors are keen to retain Openreach as part of BT Group.

which may have influenced their responses to individual questions. Of all the potential reasons to oppose structural separation the claim that the cost of capital will be higher is, in our view, among the least plausible.

66. Since Ofcom already disaggregates its estimate of the cost of capital between Openreach and the rest of BT, it is unclear that structural separation would necessarily reduce Openreach's cost of capital relative to that estimated by Ofcom: the risks associated with the Openreach business will be largely unchanged whether or not BT owns the business. The 8.8% estimate of the cost of capital produced by Ofcom would change only to the extent that more direct market evidence on required returns was available and deviated from Ofcom's current assumptions.

67. Helm's assessment that a separate Openreach would benefit from a lower cost of capital appears to come from his view of a changed regulatory regime for Openreach. We note that in setting price controls Ofcom already effectively applies a RAB model in its treatment of Openreach's assets (as discussed in Section III). The fact that, when compared on a like-for-like basis, Ofcom's estimate of Openreach's cost of capital is not much higher than those estimated by Ofgem and Ofwat suggests that Openreach investors do not perceive the regulatory regime facing Openreach to be significantly riskier than those applying to the energy and water sectors.

68. In common with other UK sectoral regulators, Ofcom does not guarantee the regulated company absolute protection against the possibility of asset stranding. Given the greater extent of competition in the communications sector compared with other utilities, this might be considered a more significant risk; yet, on the basis of Ofcom's estimates it appears that Openreach's cost of capital is not significantly affected.

69. Of course, if the regulator were somehow able to provide a cast-iron guarantee—notwithstanding the difficulties discussed in Section III—then the cost of capital might be expected to be lower. However, the investment risks would not have disappeared: they would instead be borne by consumers who could end up continuing to pay for redundant networks. Moreover, the licensed utility approach advocated by Helm would appear to come at the cost of sacrificing competition in local access infrastructure itself, in contrast with Ofcom's stated aim. A regulatory approach—such as that developed by Ofcom over many years—that encourages innovation, competition and entry in local access networks has many advantages in the long term.

## VI. Conclusion

70. The report has discussed a number of factors that affect investment in superfast broadband: providing regulatory certainty for investment via the RAB, competition in local access infrastructure and Openreach's cost of capital. It has highlighted a number of features that influence the extent of investment by Openreach and competing providers of superfast broadband networks.

71. Ofcom's treatment of Openreach's investments is very similar to the RAB model employed by other UK utility regulators. This approach appears to be successful in providing regulatory certainty to BT's investors: when presented on a comparable basis, Ofcom's estimate of Openreach's cost of capital is very close to those estimated by the energy and water regulators. On this basis there does not appear to be an easy win to

be had by changing Openreach's regulation to a RAB model. While a licensed utility approach might be able to confer a higher degree of certainty on Openreach investment by granting it a monopoly position, this would come at the expense of sacrificing Ofcom's aim to promote competition in local access infrastructure.

72. Competition plays a key role in Ofcom's approach to stimulating investment in superfast broadband. Ofcom's Digital Communications Review promises an improved access regime for BT's ducts and poles, facilitating rivals' fibre investments by reducing their cost of rollout. The prospect of competing fibre investment, which would limit BT's ability to sweat its copper assets, should also prompt BT to expand its own fibre rollout.

73. Ofcom hoped in 2005 that functional separation would prompt Openreach to improve its quality of service. As the DCR shows, this hope has not been borne out by reality. Ofcom is now turning to minimum performance standards, with significant financial penalties for failure, as a means to compel BT to raise its game in service quality. By widening the gap between BT's profit from investing and that from not investing, this approach should also incentivise investment in broadband infrastructure.

74. Ofcom's treatment of the cost of capital recognises the lower riskiness of Openreach's business as compared with BT as a whole and disaggregates the group cost of capital accordingly. BT's capital budgeting approach, by contrast, applies the same group cost of capital across all business areas. As a result, the hurdle rate for Openreach's investment exceeds its cost of capital. This gap implies that investment in Openreach is below optimal levels, perhaps by a substantial amount. Both BT's shareholders and its wholesale and retail customers should benefit from greater investment in Openreach.

75. BT's relatively low gearing compared with other regulated utilities suggests that it might be able to finance investment in the local access network by taking on some additional borrowing. Even without structural separation, it might be possible to raise debt against the revenues earned by Openreach's assets.

76. The committee heard conflicting evidence concerning the effects of structural separation of Openreach from the rest of BT Group. Of all the potential reasons to oppose structural separation we consider the claim by BT that this would increase its cost of capital and reduce investment to be among the least plausible. Rather, under current operation the mismatch between the hurdle rate and the cost of capital for each business area has the effect of misdirecting capital away from Openreach and towards riskier activities. While structural separation may go beyond what is needed to improve this situation and increase investment in Openreach, the issue should be considered in any proposed reform of its governance arrangements.

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# Formal Minutes

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**Wednesday 13 July 2016**

Members present:

Jesse Norman, in the Chair

Nigel Adams	Ian C. Lucas
Damian Collins	Chris Matheson
Paul Farrelly	Jason McCartney
Nigel Huddleston	John Nicolson

Draft Report (*Establishing world-class connectivity throughout the UK*), proposed by the Chair, brought up and read.

*Ordered*, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 208 read and agreed to.

*Resolved*, That the Report be the Second Report of the Committee to the House.

*Ordered*, That the annex be added to the Report.

*Ordered*, That the Chair make the Report to the House.

[Adjourned till Tuesday 19 July at 10.00 am

## Witnesses

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The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

### Tuesday 24 November 2015

*Question number*

**Jonathan Hines**, Managing Director, Architype, **Richard Hooper CBE**, Chair, Broadband Stakeholder Group, **Liam Maxwell**, Chief Technology Officer, Cabinet Office, and **Phil Mawhinney**, Policy Officer, Age UK

[Q1–97](#)

### Tuesday 1 December 2015

**Nick Parbutt**, Director of Strategy, Vodafone, and **David Wheeldon**, Director of Policy and Public Affairs, Sky UK

[Q98–188](#)

### Wednesday 9 December 2015

**Sean Williams**, Group Director, Strategy, Policy and Portfolio, BT Group, and **Kim Mears**, Managing Director, Infrastructure Delivery, Openreach

[Q189–290](#)

**Chris Townsend OBE**, Chief Executive, and **Andrew Field**, Superfast Broadband Programme Director, Broadband Delivery UK

[Q291–338](#)

### Tuesday 15 December 2015

**Dido Harding**, Chief Executive, TalkTalk, and **Tom Mockridge**, Chief Executive, Virgin Media

[Q339–386](#)

### Wednesday 13 January 2016

**Matthew Hare**, Chief Executive, Gigaclear, **Dana Tobak**, Managing Director, Hyperoptic, and **Scott Coates**, Chief Executive Officer, Wireless Infrastructure Group

[Q387–474](#)

### Wednesday 3 February 2016

**David Williams**, Chief Executive, Avanti Communications Group plc, and **Steve Maine**, Chief Executive, WiSpire Limited

[Q475–518](#)

**Ian Gray**, Director, Programme Delivery, West Yorkshire Combined Authority, **Councillor Jonathan Glanz**, Westminster City Council, and **Keri Denton**, Programme Director, Connecting Devon and Somerset

[Q519–575](#)



**Thursday 11 February 2016**

**Malcolm Corbett**, Chief Executive, Independent Networks Co-operative Association, **Graham Long**, Broadband for Rural Devon and Somerset, **William Perrin**, Connect8, and **Dr Charles Trotman**, Senior Business and Economics Adviser, Country Land and Business Association

[Q576–627](#)

**Wednesday 2 March 2016**

**Professor Dieter Helm CBE**, Professor of Energy Policy, University of Oxford

[Q628–735](#)

**Tuesday 15 March 2016**

**Gavin Patterson**, Chief Executive, BT and **Kim Mears**, Managing Director Infrastructure Delivery, Openreach

[Q736–906](#)

**Tuesday 12 April 2016**

**Sharon White**, Chief Executive, Ofcom

[Q907–1048](#)

**Wednesday 13 April 2016**

**Ed Vaizey MP**, Minister of State for Culture and the Digital Economy, Department for Culture, Media and Sport, and the Department for Business, Innovation and Skills

[Q1049–1151](#)

## Published written evidence

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The following written evidence was received and can be viewed on the [inquiry publications page](#) of the Committee's website.

EW numbers are generated by the evidence processing system and so may not be complete.

- 1 Actual Experience ([EWC0059](#))
- 2 Advertising Standards Authority ([EWC0099](#))
- 3 Age UK ([EWC0042](#))
- 4 Architype ([EWC0093](#))
- 5 Argyll and Bute Council ([EWC0044](#))
- 6 Arqiva ([EWC0055](#))
- 7 Avanti Communications Group Plc ([EWC0052](#)), ([EWC0107](#))
- 8 B4rds (Broadband for Rural Devon & Somerset) ([EWC0030](#))
- 9 BBC ([EWC0085](#))
- 10 BCS - The Chartered Institute for IT ([EWC0039](#))
- 11 British Chamber Of Commerce ([EWC0091](#))
- 12 British Property Federation ([EWC0090](#))
- 13 Broadband Delivery UK ([EWC0110](#))
- 14 Broadband Stakeholder Group ([EWC0048](#)), ([EWC0092](#))
- 15 BT ([EWC0063](#)), ([EWC0097](#)), ([EWC0108](#)), ([EWC0109](#)), ([EWC0116](#)), ([EWC0123](#))
- 16 Citizens Advice ([EWC0084](#))
- 17 City of London Corporation ([EWC0046](#))
- 18 Communication Workers Union ([EWC0032](#)), ([EWC0120](#))
- 19 Communications Consumer Panel and ACOD ([EWC0088](#))
- 20 Companies House ([EWC0075](#))
- 21 Connecting Devon and Somerset ([EWC0106](#))
- 22 Cornwall Council ([EWC0014](#))
- 23 COSLA ([EWC0006](#))
- 24 Councillor Martin Goss ([EWC0119](#))
- 25 Councillor Robert Barnard ([EWC0003](#))
- 26 Country Land and Business Association ([EWC0045](#))
- 27 County Broadband Ltd ([EWC0074](#))
- 28 Craley Group Limited ([EWC0015](#))
- 29 Cumbria County Council ([EWC0013](#))
- 30 Datod Ltd ([EWC0043](#))
- 31 David Mytton ([EWC0002](#))
- 32 Department for Culture, Media And Sport ([EWC0066](#)), ([EWC0121](#))
- 33 Department Of Enterprise, Trade And Investment, Northern Ireland Executive ([EWC0082](#))

- 34 Draughton Parish Council ([EWC0016](#))
- 35 EE ([EWC0061](#))
- 36 ESOA ([EWC0050](#))
- 37 Federation of Small Businesses ([EWC0026](#))
- 38 Foundation for Information Society Policy ([EWC0027](#))
- 39 Frank Bott and others ([EWC0007](#))
- 40 Gigabit Broadband Community Interest Company ([EWC0100](#))
- 41 Gigaclear ([EWC0098](#))
- 42 HM Revenue & Customs ([EWC0087](#))
- 43 Hon. Jacob Rees-Mogg, MP ([EWC0034](#))
- 44 Hundred Hills Vineyard ([EWC0101](#))
- 45 Hutchison 3G UK Ltd (Three) ([EWC0010](#))
- 46 Hyperoptic Ltd ([EWC0051](#))
- 47 Ian Pearson ([EWC0019](#))
- 48 Independent Networks Co-operative Association Ltd ([EWC0001](#))
- 49 Internet Services Providers' Association ([EWC0070](#))
- 50 ITV ([EWC0086](#))
- 51 John Howell MP, Henley Constituency ([EWC0111](#))
- 52 KCOM Group Plc ([EWC0094](#))
- 53 Local Government Association ([EWC0040](#))
- 54 Mayor of London ([EWC0058](#))
- 55 Mobile Operators Association ([EWC0033](#))
- 56 MoneySavingsExpert.com ([EWC0083](#))
- 57 Mr David Simpson ([EWC0017](#))
- 58 Mr Philip Quinlan ([EWC0004](#))
- 59 Mrs Anne Tutt ([EWC0095](#))
- 60 National Farmers Union (NFU) ([EWC0022](#))
- 61 National Parks England ([EWC0060](#))
- 62 Norfolk Various ([EWC0025](#))
- 63 Nottinghamshire County Council ([EWC0049](#))
- 64 O2 ([EWC0057](#))
- 65 Objective Designers ([EWC0068](#))
- 66 Ofcom ([EWC0078](#)), ([EWC0114](#)), ([EWC0125](#))
- 67 Ofcom Advisory Committee for Northern Ireland ([EWC0035](#))
- 68 Ofcom Advisory Committee for Scotland ([EWC0012](#))
- 69 Oxfordshire County Council ([EWC0126](#))
- 70 Paget Analyst Services Ltd ([EWC0071](#))
- 71 Philip Virgo ([EWC0020](#))

- 72 Post Office Limited ([EWC0079](#))
- 73 Professor Dieter Helm ([EWC0102](#))
- 74 Professor Vincent Porter ([EWC0113](#))
- 75 RWE npower ([EWC0081](#))
- 76 Scottish Government ([EWC0023](#))
- 77 Shropshire Council ([EWC0009](#))
- 78 Sky ([EWC0072](#)), ([EWC0115](#))
- 79 South Somerset District Council ([EWC0122](#))
- 80 SSE ([EWC0047](#))
- 81 Steve Barnes ([EWC0096](#))
- 82 Talk About Local ([EWC0031](#))
- 83 Talktalk Group ([EWC0056](#))
- 84 TechUK ([EWC0080](#))
- 85 Tees Valley Unlimited ([EWC0011](#))
- 86 The Bit Commons ([EWC0008](#))
- 87 The Center for Copyright Integrity ([EWC0018](#))
- 88 The Federation of Communication Services ([EWC0037](#))
- 89 The Rt Hon Dr Liam Fox MP ([EWC0021](#))
- 90 Transport for London ([EWC0124](#))
- 91 UKB Networks Ltd ([EWC0054](#))
- 92 UKspace ([EWC0067](#))
- 93 Virgin Media ([EWC0064](#))
- 94 Vodafone ([EWC0065](#))
- 95 Walter Willcox ([EWC0112](#))
- 96 Wansdyke Ltd ([EWC0053](#))
- 97 Welsh Government ([EWC0077](#))
- 98 West Yorkshire Combined Authority ([EWC0036](#)), ([EWC0103](#))
- 99 Westminster City Council ([EWC0041](#)), ([EWC0104](#))
- 100 Wireless Infrastructure Group Limited ([EWC0038](#))
- 101 Wispire Ltd ([EWC0024](#)), ([EWC0105](#)), ([EWC0118](#))
- 102 Wretham Parish Council ([EWC0117](#))

## List of Reports from the Committee during the current Parliament

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All publications from the Committee are available on the [publications page](#) of the Committee's website.

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

### Session 2015–16

First Special Report	Tourism: Government response to the Committee's Sixth Report of Session 2014–15	HC 382
Second Special Report	Society Lotteries: Government response to the Committee's Fifth Report of Session 2014–15	HC 415
First Report	BBC Charter Review	HC 398
Second Report	Appointment of the Information Commissioner	HC 990

### Session 2016–17

First Report	Cyber Security: Protection of Personal Data Online	HC 148
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