



**Virgin Media's response to Ofcom's Business Connectivity Market Review :
Preliminary Consultation on Passive Remedies**

9 January 2015

Non Confidential Version



Summary

Virgin Media is sceptical that permitting access to BT's passive infrastructure will deliver sufficient *incremental* benefits to justify its introduction. The evidence of ten years of passive remedies in the consumer markets across Europe shows that their existence results in less investment in infrastructure; and it is infrastructure-based competition that leads to the best outcomes for consumers.

We are doubtful that access to dark fibre will herald a new wave of innovation-lead investment or yield greater productive efficiency. Whilst both are laudable aims we see the latter as illusory and the former, if it exists, achievable more efficiently and just as effectively by adapting the existing suite of remedies and improving BT's Statement of Requirements process. In Virgin Media's view, the regulatory framework exists to address proven competitive inhibitors. Imposing passive remedies absent of any proven market failure on the basis of satisfying intangible demand, or to facilitate speculative innovation claims, would be contrary to the purpose of the framework.

Moreover, we do not believe that a material problem exists to be solved. Nor is it clear what ultimate outcome or objective would be achieved by the imposition of passive remedies. We are not aware of any evidence that the absence of passive remedies accentuates an enduring competition problem, is frustrating innovation or is otherwise causing consumer harm. Even if the imposition of passive remedies could lead to some benefits, we believe that the very probable downsides and the burden of implementation render such intrusive intervention highly disproportionate.

In the main, we see the clamour for dark fibre as, an 'arbitrage play' designed to reduce the cost of 4G rollout by providing the mobile operators with a cheaper alternative - or, at least, the threat of one. This is not competition 'on the merits' but an opportunity to exploit differences in the pricing structures of downstream and upstream products. It will adversely affect those that buy links of lower capacity, potentially significantly, as well as discouraging investment in underlying infrastructure. It will not, in our view, lead to an increase in infrastructure deployment. Rather CPs will substitute active inputs for 'lower level' inputs based on *existing* infrastructure.

We note that in previous market reviews, Ofcom has considered passive remedies in detail and it has consistently found that it is neither necessary nor appropriate to impose them. We do not believe that there have been material



changes to market conditions that should alter this view; the existing suite of remedies has, in general, served the markets well and to the extent that issues do exist we believe they can most effectively (and efficiently) be addressed by adjusting the existing remedies.

If Ofcom is persuaded, in principle, of the case for passive remedies there are considerable practical difficulties in their introduction: How can they be accommodated within the regulatory framework? Will it be necessary for Ofcom fundamentally to restructure the exiting Business Connectivity market configuration? How will Ofcom ensure that regulated passive inputs are not used to supply services in markets which are competitive and in which no CP has SMP? Indeed, any assessment of the benefits of access to passive remedies should be tempered by what we know from experience: their introduction will take many years, take significant regulatory support, involve disputatious wrangling and may ultimately prove ineffective.

We note in this regard that the introduction of the PIA remedy in the Wholesale Local Access market has largely proven to be ineffective – and take up has been insignificant. This is not, in Virgin Media's view, a consequence of its use being restricted to the provision of broadband services. Rather, the product is very difficult to use in practice – and it has become apparent that this is due in no small part to the fact that the network to which it has been applied was never designed with shared access in mind. For example, the process which purchasing CPs must follow is cumbersome and lengthy (including duct surveys, planning, and other logistics) and in many cases infrastructure is either space constrained, unavailable for security or other commercial reasons or, in the case of poles, subject to complex technical or environmental restrictions. Furthermore, the introduction of PIA was drawn out and contentious (requiring significant input from and involvement by Ofcom). We do not consider that a similar remedy imposed in the Business Connectivity market, including access to dark fibre, would be any different in this regard.

If Ofcom considers that it can overcome these considerable difficulties and proceeds to impose a passive remedy, its pricing should be set so that it is only attractive to those who can provide the contestable parts of BT's network more efficiently than BT can or who can innovate (and differentiate and thereby become more attractive to existing and prospective customers). This will ensure competition 'on the merits' and (we believe) necessarily constrain the impact of passive remedies on the pricing of other services.

We set out our case below, and answer Ofcom's specific questions in section 2. In the Annex we set out the procedural challenges in the implementation of a passive remedy in the Business Connectivity markets.





Section 1

Passive Remedies: what problem do they solve?

If Ofcom proceeds to impose a passive remedy in the Business Connectivity market it must be satisfied that there is a material problem in the market, the solution to which requires the imposition of passive remedies. We do not believe that this is the case – and more specifically do not believe that any material problem exists at all. We see no evidence of market failure or otherwise of consumer harm; rather the existing suite of remedies has served the market well and is generally succeeding in addressing any competition problems that have been identified. Furthermore, we do not believe that the absence of passive remedies is inhibiting either competition or innovation, nor is it harming consumers. We question therefore what problem Ofcom would be seeking to solve by imposing passive remedies.

Proponents of such an intervention have cited the enablement of innovation and an enhancement to competition as key outcomes. While any improvements of this type are to be welcomed they are, in this context, simply that – incremental benefits for a generally well functioning market, rather than necessary solutions to material problems. Notwithstanding our scepticism of the capability of passive remedies to lead to such outcomes, we believe that they could be achieved by much less intrusive means, in particular by refining the existing regulatory arrangements.

We also note that some stakeholders have attempted to draw a parallel with the introduction of passive remedies in the Wholesale Local Access Market. We consider the circumstances are different and that as such it is not appropriate to use the imposition of the PIA remedy in that market as a justification for a similar imposition in the Business Connectivity market. The PIA remedy was introduced to address a specific problem – that being to expand availability and coverage of mass market superfast broadband products. Ofcom envisaged that PIA would be the principal means of competition in areas in which BT had not upgraded its network to superfast capability (and that, accordingly, competing CPs would use BT's duct and pole assets to deploy their own network infrastructure in those areas). This is a very different rationale to that being put forward for the imposition of passive remedies in the Business Connectivity markets.

Contrary to claims by some proponents of passive remedies, there has been significant investment in infrastructure in the UK in recent years. Virgin Media, for example, has invested in additional infrastructure/expanded and



upgraded its network.¹ We are also engaged in a program of footprint expansion, for example our programme to pass an additional 100,000 homes in east London.² Further, Virgin Media has engaged in a progressive upgrade of its network to deliver the fastest widely available broadband in the UK and has made this available as a business package.³

BT, for its part, has progressively invested in infrastructure and upgraded its network.⁴

As we have set out below, there is much evidence to suggest that these types of investment would be placed in jeopardy by the imposition of passive remedies.

We believe that any suggestion or expectation that the imposition of passive remedies will lead to more infrastructure ownership or deployment, and thereby increased infrastructure based competition, is entirely misguided. In fact the opposite is true, given that incentives to deploy new infrastructure would be diminished for both existing owners of network assets and CPs purchasing inputs from them.

The Evidence on the effect of Passive Remedies

Regulation mandating the unbundling of copper telecommunications networks has now been in place for more than fifteen years, but the evolution of broadband penetration has shown substantial differences between OECD countries. It is therefore possible to study its effect on investment and penetration. Virgin Media has reviewed much of the published evidence; we think that it reveals that:

- Infrastructure (inter-platform) competition between (say) DSL and cable networks is the 'gold standard' which delivers better benefits for consumers than intra-platform competition;

¹ [Confidential]

² <http://about.virginmedia.com/press-release/9444/virgin-media-takes-superfast-broadband-to-east-london>

³ Virgin Media Business offers business connectivity based on both our Cable network and via dedicated fibre connections. <http://www.virginmediabusiness.co.uk/Products-and-solutions/Broadband-and-Internet-Services/Business-Broadband/>

⁴ BT's £2.5bn investment in fibre roll out to residential and business premises is well documented, with an additional £50m being committed in 2014 - <http://www.zdnet.com/article/bt-injects-50m-into-patching-up-2-5bn-fibre-rollout/>



- The supposed ladder of investment (from service-based intra-platform competition to facilities-based intra-platform) does not lead to entrants 'stepping off the ladder' and investing in their own infrastructure. In fact, there is only weak evidence of movement up the ladder at all. Put simply, passive remedies do not necessarily lead to 'better things' and a passive remedy is not a means to an (inter-platform competition) end;
- Passive remedies (LLU) have some, but limited, incremental benefits above active remedies (bitstream access);
- However, passive remedies have longer-term detrimental effects on investment in competing infrastructure.

We cover these points in more detail individually below and we cite research evidence that we believe is representative. Collectively, we suggest that these studies should be sufficient to make Ofcom extremely wary about introducing a passive remedy into the business connectivity market.

Infrastructure competition delivers better benefits

Bouckaert, van Dijk and Verboven (2010)⁵ distinguish between a) inter-platform competition; b) facilities-based intra-platform competition; and 3) service-based intra-platform competition. Based on a sample of OECD countries, their analysis finds that inter-platform competition has been the main driver of broadband penetration. The two types of intra-platform competition have a "considerably smaller effect on the broadband penetration". The authors suggest three reasons for their findings:

- The incumbent DSL operator finds it less profitable to invest in its DSL network if the resulting investment also benefits rivals who pay below market rates for access;
- Having access to the DSL network at advantageous terms cannot increase the entrants' incentives to invest in their own facilities;
- Advantageous access rates lead to further DSL entry than would otherwise arise. This increased, but narrowly scoped competition is likely to reduce returns from investing in an alternative platform such as cable or wireless.

⁵Jan Bouckaert, Theon van Dijk, Frank Verboven; Access regulation, competition, and broadband penetration: An international study. Telecommunications Policy 34 (2010) pp 661 – 671.



Nardotto, Valletti and Verboven⁶ use data sets for the UK on broadband penetration and speeds to analyse the impact of inter-platform competition (cable vs. traditional telcos) and intra-platform competition (whereby entrants access BT's network). They find that intra-platform competition through LLU entry has not significantly raised total broadband penetration. In contrast, inter-platform competition has had a more significant impact and "always leads to market expansion" (p.28). LLU has had a positive impact on the quality of service provided, although inter-platform competition has a positive impact on both penetration *and* quality.

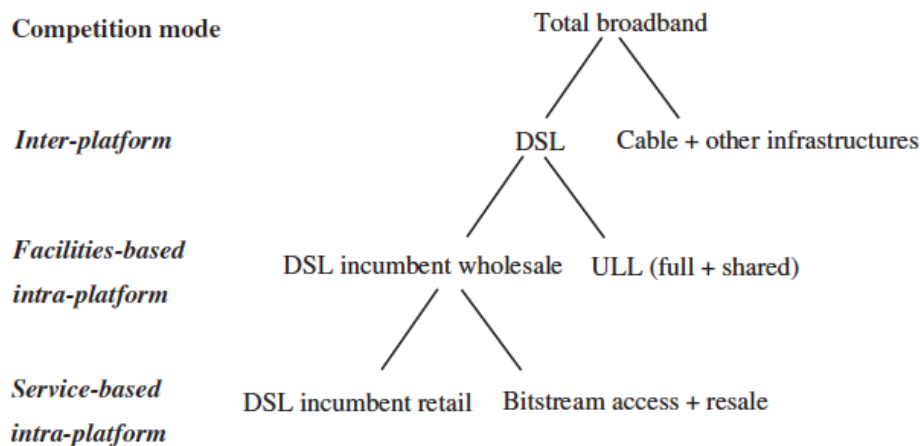
In contrast, Crandall, Eisenach and Ingraham⁷ are more negative about LLU. They find that "...it is clear that copper-loop unbundling did not accelerate the deployment or increase the penetration of first-generation broadband networks, and that it had a depressing effect on network investment. Overall, the evidence....suggests that the long-run effect of copper unbundling has been to reduce broadband penetration." (p. 279).

Buyers of passive remedies do not 'jump off' the ladder of investment

The ladder of investment philosophy was adopted by many European (and other) regulators in the era of copper networks as a means of implementing unbundling in a way that progressively promotes competitive providers' infrastructure investment. Entrants were expected to move up the ladder. By setting low access prices, the regulator encourages service-based entry in the short term. Then, once entrants have gained a customer base and acquired market experience, they can climb the ladder and invest in their own facilities. Hence, service-based competition serves as a stepping-stone for facilities-based entry. This is shown in the diagram below (courtesy of Bouckaert et al).

⁶Mattia Nardotto, Tommaso Valletti and Frank Verboven; Unbundling the Incumbent: Evidence from UK Broadband. Centre for Economic Policy Research, Discussion Paper No. 914, October 2012.

⁷Robert W. Crandall, Jeffrey A. Eisenach, Allan T. Ingraham; The long-run effects of copper-loop unbundling and the implications for fiber. Telecommunications Policy 37 (2013) pp. 262-281.



Bacache, Bourreau and Gaudin⁸ build an empirical model to test the three rungs (bitstream access, local loop unbundling and new access facilities) of ladder of investment hypothesis. They find no evidence in support of the hypothesis i.e., no effect of the past number of service-based unbundled lines on the number of new access lines owned by entrants. They also consider a 'short' ladder composed of only two access rungs (bitstream access and local loop unbundling): the idea that new entrants may invest up to the local loop unbundling rung, but may be unable to replicate the last local loop rung. They find only weak support for the short ladder.

Passive remedies have limited incremental benefits above active remedies

Martin Cave in a recent paper reviewing the history of and prospects for the ladder of investment⁹ summarises the empirical evidence as follows: "...inter-platform competition has a significant positive effect on penetration, bitstream-based competition has a negative effect, while ULL-based entry has a small positive effect.....policy makers should focus on the promotion of inter-platform competition". Put another way, competition based on passive remedies has a generally positive, but not very large effects.

Passive remedies deter investment

There is evidence of a trade-off between access regulation and investment incentives in telecommunications. This has long been recognised.¹⁰ The role

⁸Maya Bacache, Mark Bourreau and Germain Gaudin; Dynamic Entry and Investment in New Infrastructures: Empirical Evidence from the Fixed Broadband Industry. Review of Industrial Organisation 44 (2014) pp. 179-209.

⁹Martin Cave; The ladder of investment in Europe, in retrospect and prospect. Telecommunications Policy 38 (2014) pp. 674-683.

¹⁰The theories suggest that access regulation has a negative impact on investment by a) lowering the net present value (NPV) of incumbents'



of access regulation with respect to infrastructure investment by entrants is inherently ambivalent: access regulation reduces barriers to entry because entrants do not need to duplicate the existing network, but it also reduces incentives to build new infrastructure because infrastructure can be rented from incumbents at regulated prices. Hence, permitting access to incumbents' infrastructure can undermine not only incumbents' incentives but also entrants' incentives to invest in infrastructure.

Grajak and Roller¹¹ find empirical evidence of the trade off between access regulation and investment incentives. They find that regulation has a quite different impact on the investment decisions of incumbents and entrants, discouraging investment by incumbents and individual entrants even as entrants' total investment increases. Grajak et al also find, by treating regulation endogenously, that regulatory responses to infrastructure investment differ between incumbents and entrants. Access regulation is not affected by entrants' investment but "regulators respond to higher infrastructure investment by incumbents by providing easier access, thereby undermining incumbents' incentives to invest in infrastructure in the first place". (p. 211).

The evidence reviewed by Virgin Media demonstrates that the best benefits for consumers come from inter-platform competition; this brings improvements in penetration and quality. However, bitstream and LLU passive remedies do not increase the intensity of inter-platform competition, instead they reduce facilities-based investment.¹² Moreover, the step up in the ladder from active to passive remedies does not deliver significant incremental benefits and unbundling has little effect on broadband penetration. The implication of this analysis is that Ofcom would need compelling evidence of manifest incremental *net* benefits arising from the introduction a passive remedy for the Business Connectivity market *over and above* the current mix of active

investments; b) shifting the risk from entrants to incumbents and c) increasing incumbents' risk exposure and thereby, cost of capital.

¹¹Michal Grajek and Lars-Hendrik Roller; Regulation and Investment in Network Industries: Evidence from European Telecoms. Journal of Law and Economics, 55 (February 2012).

¹²As Ofcom notes in paragraph 2.24: "If passive access provides a lower-cost or lower-risk route to market that self-build, this will change the future returns on past self-build decisions and...reduce the incentives for self-build in areas where CPs (other than BT) are not yet present. As Robert Pindyck notes "...sunk costs *do matter* in decision making when those costs *have yet to be sunk*..." See MANDATORY UNBUNDLING AND IRREVERISBLE INVESTMENT IN TELECOM NETWORKS. Working Paper 10287 National Bureau of Economic Research, February 2004.



remedies and competition to consider its introduction. We suggest below that this evidence does not exist and that there are additional dis-benefits that will materialise from the introduction of a passive remedy other than the detrimental effect on investment. Fortunately, Ofcom's principles set a high bar on more intrusive regulation.¹³

We are sceptical that Passive Remedies will yield material innovation benefits

Ofcom, in previous reviews, has rejected a call from some CPs to require BT to allow access to its passive infrastructure to provide business connectivity services. Although Ofcom noted that passive access could "provide more scope for product innovation and service differentiation in some cases"; it found that multiple other factors outweighed the benefits of introducing passive remedies, and the suite of less intrusive (active) remedies could achieve similar outcomes.¹⁴

Ofcom, in its latest consultation has continued to identify "innovation and improvements in service quality" as a positive reason for the introduction of passive remedies, suggesting that this would result in dynamic efficiency. In particular, Ofcom suggests that C-RAN technology could be developed more quickly in conjunction with a passive remedy. Colt has further suggested that passive inputs would facilitate the creation of different network topologies.

Ofcom identifies mobile and fixed broadband backhaul as the two key uses for passive access and specifically asks what advantages dark fibre could bring to those two uses.

Services available over dark fibre can, by and large, be provided over active remedies.

An argument from some CPs is that they are constrained in innovating because of the limitations inherent in purchasing BT active remedies.

Ofcom's view in the last BCMR was that BT has, by and large, kept pace with the demands of innovation in the markets.¹⁵ BT agreed with Ofcom and

¹³ For example: Ofcom's bias against intervention and its desire to seek always the least intrusive regulatory mechanisms to achieve its policy objectives

¹⁴ Business Connectivity Market Review, Final Statement, 28 March 2013, Section 8

¹⁵ Paragraph 8.103 Business Connectivity Market Review Final Statement 28 March 2013.



stated it was at the forefront of innovation.¹⁶ BT also did not agree that passive remedies promote innovation over actives per se. Virgin Media agrees with this assessment of BT's position in the market. In particular, we do not believe that the absence of a passive remedy is a barrier to, or is stifling, innovation. On the contrary, we consider that under the existing regulatory arrangements BT is well placed to innovate, given its financial and other resources, and its expertise. Further, to the extent that demand for new products and technologies exists, tools are available, in the shape of the Statement of Requirements (SoR) process, to require BT to be responsive to the demands of its customers for new and enhanced solutions.

To the extent that the current SoR process does not deliver as efficiently as customers expect, this should not in itself be a reason for Ofcom imposing an overly intrusive remedy in its place. Rather, Ofcom should examine how the current regulation operates and look to resolve issues with that remedy in the first instance. For example, although there was frustration over the speed with which Openreach introduced SyncE, a synchronous Ethernet product in order to enable more efficient mobile backhaul, this was reflection more on the SoR process than a lack of ability or technology on the part of BT to develop a new solution.

Colt has also suggested that the fact that some existing 'niche' technologies (e.g., MSP Ethernet interfaces, software defined networking and performance monitoring systems) are available in the UK through other CPs shows that BT cannot offer these solutions via active remedies. This is the same issue as discussed above in relation to SyncE, and any inertia related to difficulties in implementing new solutions via the SoR process should not be used as a reason for introducing passive remedies. If these other technologies are available via other CPs, and to the extent that there is genuine demand for them, BT Openreach should have an incentive to make them available in order to remain competitive.

Other respondents to the CFI supported the innovation argument without citing any specific innovation that could be brought by the introduction of mandated passive access. A lack of evidence instead suggests that the support for passives, rather than being driven by genuine desire to innovate, is a speculative wish to benefit from an arbitrage opportunity (see below).

Although Ofcom specifically cites C-RAN as an example of a solution that could benefit from dark fibre, there is considerable evidence that C-RAN

¹⁶ Business Connectivity Market Review: Timetable and Call for Inputs, 1st April 2014, BT Response of 27 May 2014 at page 27



solutions can be developed over existing services, and that given their relative cost advantage this is, in fact the preferred solution.¹⁷

Other commentators¹⁸ have also echoed the difficulty of using dark fibre for C-RAN deployment, with one particular challenge of dark fibre relating to a difficulty to manage and troubleshoot given that the monitoring capability of dark fibre does not support detecting faults and service impairments which is crucial for the deployment of a C-RAN solution.

Some advocates of passive remedies have suggested that they may use duct and dark fibre to create or replicate their own network topologies in conjunction with their own network elements – for example ring networks as an alternative to the ‘hub and spoke’ model dictated by BT’s network. In this regard, we note that such solutions would still be constrained to a certain extent by BT’s underlying network architecture, as the duct and unlit fibre would still be configured / laid in a manner that corresponds with BT’s existing hub and spoke design. Moreover, they would also result in CPs networks being compromised of a mixture of their own infrastructure elements and passive inputs from BT, which would surely give rise to increased management and operational overheads and inefficiencies.

Deployments of this type would also have a high level of dependency on the availability (and condition) of BT’s network infrastructure. For example, trials of the PIA remedy imposed in the Wholesale Local Access market demonstrated that BT’s ducts can be full, lacking in space or otherwise unavailable to third parties. Similarly, dark fibre is a finite resource. To suggest, therefore, that CPs could be freed up by the introduction of passive remedies significantly overstates the architectural freedom provided by a passive remedy over any active remedies run over the fibre.

Dark fibre is available already, and innovation has not been driven by this availability

Dark fibre is commercially available from a number of providers including Virgin Media. Whilst its availability may be limited, we are not aware of any evidence of innovation that has been introduced as a consequence of its availability, or of capabilities developed beyond those that can be offered via active inputs materialising.

¹⁷For example, Altiostar’s claim that C-RAN over Ethernet is more scalable and cheaper than a dark fibre based solution.<http://www.lightreading.com/roi-tco/altio-stars-c-ran-steps-into-the-light-junks-dark-fiber/d/d-id/712169>

¹⁸ For example, The Mobile Network 9 June 14 <http://the-mobile-network.com/2014/06/why-c-ran-fronthaul-is-a-big-challenge-to-existing-network-infrastructure-technologies/>



Any take-up of Passive Remedies will likely be driven by an arbitrage opportunity rather than an innovation benefit

Arbitrage occurs when a CP can provide a service equivalent to an Openreach access service (e.g., EAD) by buying the relevant electronics plus access to dark fibre at a lower price than for the 'managed' active solution even though the cost to the CP of providing this solution is *no lower* (it could, in practice, be higher) than Openreach's cost. The acquiring CP saves money, not by being more efficient, but by taking advantage of the way that BT has chosen to recover the costs common to a number of its services.

The opportunity can be created by product or by geography.

- Product arbitrage is likely to exist where a high value, high bandwidth service can be undercut by a passive based solution.
- Geographic arbitrage is likely to exist where a uniform geographic passive price allows entry to BT's infrastructure in high-density areas (where cost of construction is higher, but more customers can be served at a lower distance).

Approaches to date

Ofcom discusses the potential for arbitrage created by the introduction of passive remedies in the consultation,¹⁹ and for dark fibre, focuses on product-based arbitrage.²⁰ The arbitrage opportunity was also summarised by Vodafone in their response to the April CFI

"Where BT provides some services at a price above FAC (for example under a charge control), this would produce a regulatory arbitrage opportunity, as the CP would be able to deliver a similar capability using passive access at FAC while still making a reasonable return..... where the use of passive access was driven

¹⁹Business Connectivity Market Review: Preliminary Consultation on Passive Remedies, 5th November 2014, paragraph 7.36 et seq

²⁰ For example, where one national market is competitive (e.g., MI), then it may be impossible to implement a passive remedy in other national markets even where BT has SMP. If a geographic area was defined where BT held SMP in all markets, this would allow a passive remedy to be taken up in all markets.

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by regulatory arbitrage opportunities rather than efficiency would not achieve Ofcom's objectives to ensure efficient competition"²¹

Being able to price certain services above FAC, based upon consumers' willingness to pay, can be allocatively efficient. Therefore, if an arbitrage opportunity results from the introduction of passive remedies, it may dent efficiency, as any necessary consequential price rebalancing to counter the arbitrage would reduce overall efficiency benefit. We discuss below why we believe that this effect could be material.

The counter argument is that allocative efficiency is only one type of efficiency, and dynamic efficiency is increased through passive remedies providing more competition e.g., through innovation resulting in differentiated offerings.²² However, as we note above: a) passive remedies can dent dynamic efficiency by reducing the incentives to invest in end-to-end infrastructure; and b) we are sceptical that there are meaningful innovation benefits from access to passive remedies. Indeed, we suspect that the strong desire for access to dark fibre on the part of the mobile operators is motivated by a (legitimate) desire to reduce the cost of running and expanding their 4G networks. As Ofcom notes; "mobile network operators (MNOs) use large volumes of leased lines to carry mobile voice and data services between their radio base stations and switching centres".²³

Additionally, Vodafone suggests that the allocative efficiency argument is only valid if the overall basket of goods is priced at FAC, and suggests that BT overprices the Ethernet basket, so there is a sub-optimal outcome for consumers even with the bandwidth gradient. Ofcom, however, says that it has not received any evidence that current BT pricing is inefficient.²⁴

Ofcom identifies that regulated passive pricing would impact any arbitrage opportunity. A cost based control (as per PIA and traditional Charge Controls), would require pricing based on cost, and be most likely to create arbitrage opportunity. An ability to purchase dark fibre based upon BT's cost would not reflect the current bandwidth gradient applied to active products, and as such create the product based arbitrage opportunity discussed above where it

²¹ Frontier Report for Vodafone:

http://stakeholders.ofcom.org.uk/binaries/consultations/business-connectivity-market-review/responses/Vodafone_Annex_2.pdf

²² Business Connectivity Market Review: Preliminary Consultation on Passive Remedies, 5th November 2014, paragraph 4.7

²³ Business Connectivity Market Review: Preliminary Consultation on Passive Remedies, 5th November 2014, paragraph 2.3

²⁴ Business Connectivity Market Review: Preliminary Consultation on Passive Remedies, 5th November 2014, paragraph 4.31



would be cheaper to purchase dark fibre plus necessary electronics / equipment than a high bandwidth active solution (which was priced towards the top of the bandwidth gradient).

Ofcom suggests that a 'value minus' pricing approach (based on the price of the active solution less the incremental cost of the provision of its active elements) may be as suitable for dark fibre.²⁵ Whilst Virgin Media is of the strong belief that the introduction of a passive remedy cannot be justified, a 'value minus' approach would be essential to ensure that any arbitrage opportunity was minimised. CPs should only want to buy access to dark fibre if doing so means that a) they can supply the product (fibre plus electronics) cheaper than buying the active solution from BT or b) access to dark fibre would result in new innovation (which presumably would either mean lower costs or benefits for consumers in quality of service, or both). Put another way, value-minus pricing would ensure that these conditions are met and flush out the arbitrageurs who have no interest in competition 'on its merits'.

However, as Ofcom discusses, there are alternative benchmarks from which to derive value-minus prices: individual products; a basket of products or a reference product, all of which have positive and negative elements, trading off the ability to constrain potential arbitrage against other considerations.

A value minus based on individual products does constrain arbitrage opportunities to a minimum, but as noted by Ofcom, would create an artificial constraint on the offering, with the user of the dark fibre being required to use the facility as a direct replacement for the active product upon which the pricing was based. We agree with Ofcom that this would create a number of impracticalities including the need to 'police' the use made of the rented fibre and potentially constraining the use of fibre in a way that replicated the active product on which it was based.

A basket-based approach would allow a price to be set on the basis of a number of different products. We do not believe that such an approach would work, as it would still allow for arbitrage opportunities on more valuable higher bandwidth products which could be undercut by the average 'basket' price set under a control, allowing for 'cherry picking' as Ofcom identifies.

Ofcom also discusses the use of a 'reference' product, which could benchmark the regulated cost of dark fibre. Ofcom suggests that 1Gbit/s EAD may provide such a reference as a "desirable to use a higher priced active product", which currently attracts more common cost than lower bandwidth products. This approach is seen as reducing (although not removing) the

²⁵ Business Connectivity Market Review: Preliminary Consultation on Passive Remedies, 5th November 2014, paragraph 7.22



arbitrage opportunity and reducing the need for BT to rebalance its prices in response.

Virgin Media considers that an approach based upon a 1Gbit/s EAD reference product would still be flawed. Although the arbitrage opportunity would be removed for the purchase of circuits up to and including 1Gbit/s, it would remain for more costly higher bandwidth and WDM solutions, which is where the focus of a dark fibre arbitrage is likely to be. These high value circuits are the very ones where the opportunity to procure the same service at a lower cost will be most attractive to the buyers, and would have the potential to significantly skew competition. As Ofcom notes, the future trend is for bandwidths to increase, so the potential effect of the arbitrage is likely to increase throughout the control period.

Whilst Virgin Media agrees that a value minus approach is the best way to set the price of dark fibre, we believe the reference product should be set with an eye on where arbitrage is likely to happen in the *future*, rather than based on an assessment of which current product contributes most to common costs. This is clearly an area that requires further work.

The Impact of a Passive Remedy on the pricing of some Leased Line Services could be material

Ofcom explains, at paragraph 5.13 of the consultation, that Leased Lines are subject to regulatory charge controls which aim to bring prices in line with a cost that comprise three components:

- a. The Incremental Cost of the Service
- b. A Contribution to Common Costs
- c. A mark up to reflect BT's cost of capital

Where, a plus b is reported as the Fully Allocated Cost (FAC) of the service in the RFS.

Because the price of individual services are not directly controlled (save for the use of sub-caps), and BT is only required to ensure that a relevant basket of services meets the FAC based limit in aggregate, it has a measure of discretion as to how individual services are priced and essentially allows for some services to make a greater contribution to common costs than others when measured on a per circuit basis.

In the Ethernet market, where the charge control basket covers a wide range of services, with similar underlying costs of provision, this flexibility manifests itself in a 'bandwidth gradient': BT charges more relative to cost for higher



bandwidth services than for lower bandwidth services. Ofcom assesses that the bandwidth gradient may be an efficient way to recover common costs.²⁶

If the availability of passive remedies disrupts the purchasing profile of active products (fewer high capacity bandwidth services are sold) this would undermine the effect of the bandwidth gradient and force BT to realign its prices to ensure that: (a) any charge control continued to be met and (b) common costs for the product set continued to be recovered.

Ofcom recognises the potential for distortion. At Figure 2, it sets out a 'relatively low' impact and a 'relatively high' impact case.

- The low case is based on a loss of 1Gb AI plus MI circuits, which Ofcom assesses as currently accounting for £70m of common costs.
- The high case is based on the above loss plus 50% of 10Mb and 100Mb circuits, which currently account for £155m of common costs.

We agree that Ofcom is correct to assume that Openreach loses all internal and external sales of these circuits, as BT's retail arm should be treated as having the same incentives as any independent third party CP, when choosing whether to purchase an active or passive remedy. Indeed, BT 'retail' may well be able to buy and install electronics at a lower cost than other CPs, given its experience, purchasing power and scale advantages.

Virgin Media has engaged RGL to model the potential re-distribution of common costs for the scenarios envisaged by Ofcom, and other potential scenarios.

RGL populated a model with data from BT's RFS in order to determine common costs allocated to relevant products. The model calculates the quantum of common costs that would be unrecovered by BT by the substitution of a dark fibre solution for an 'active' circuit. The knock-on effects for the pricing of other leased line products is then estimated assuming that BT continues to recover the displaced common costs.²⁷

²⁶Business Connectivity Market Review, Final Statement, 28 March 2013, Annex 12, paragraph A12.176

²⁷ Ofcom confirm that such displaced costs could be recovered either through an active charge control; via a basket control (allowing BT discretion to recover common costs across services within the basket); or through inherent flexibility if a charge control is not implemented (see Business Connectivity Market Review: Preliminary Consultation on Passive Remedies, 5th November 2014; footnote 32)



We do not consider that it would be likely that common costs could be easily absorbed by other services outside of the Business Connectivity market. Ofcom suggests that costs could be redistributed to FAMR markets (ISDN, WLR, LLU), however, these services are subject to their own charge control which runs to a different time period than the LLCC. Further, the pricing of GEA is likely to be constrained by the margin squeeze condition. BT may not wish to make other compensating changes in order to recover displaced common costs from GEA.²⁸

The model included a specific analysis based on Ofcom's relatively low case and relatively high case.

Ofcom's "relatively low" case

If common costs were no longer able to be recovered from 1GB / MI products and were redistributed within the AI basket, this would result in up to 26% additional common costs to be recovered (from individual services) if attributed on a pro-rated basis to relevant services.

We set out below an extract of our assessment of the effect on pricing for the "relatively low" case on representative products in Table 1.

TABLE 1

Product	Current FAC	Additional Common Costs	Existing Unit charge	Unit Charge Uplift	Uplift
EADLA 10Mb rental internal	16.8	2.5	2,016.09	280.11	15%
EADLA 10Mb rental external	4.0	0.6	1,899.91	279.90	15%
EADLA 10Mb connection internal	1.8	0.4	1,070.59	218.22	23%
EADLA 10Mb connection external	1.7	0.4	1,016.87	218.20	23%

²⁸ For example, adjusting retail pricing upwards, or removing "high profile" inclusive offers on BT Sport channels.



Our analysis shows that reallocation of common costs would lead to significant price increase for other services, giving rise to a number of negative effects, including making lower bandwidth services (which can typically service larger SMEs, a particular area of focus for Ofcom) much more expensive; reducing switching from legacy TI products and therefore creating a technology “drag” in the market generally; skew incentives for businesses to take different technology solutions such as SFFB potentially creating an unbridgeable division between business broadband and dedicated data circuits.

Ofcom’s “relatively high” case

Again, using the same redistribution methodology as above, this would result in up to 57% increase in common costs to be recovered on some services if attributed on a pro-rated basis, a significant increase when compared to Ofcom’s relatively low case .The prospect of a 50% increase in common cost allocation would have an unprecedented effect on pricing of affected services, potentially doubling the cost of connections, which we set out below in Table 2.

TABLE 2

Product	Current FAC	Additional Common Costs	Existing Unit charge	Unit Charge Uplift	Uplift
EADLA 10Mb rental internal	16.8	5.6	2,016.09	1,240.50	34%
EADLA 10Mb rental external	4.0	1.4	1,899.91	1,239.58	34%
EADLA 10Mb connection internal	1.8	0.9	1,070.59	966.42	51%
EADLA 10Mb connection external	1.7	0.9	1,016.87	966.31	51%



Therefore, Virgin Media is concerned that the potential unit price increases shown in Ofcom's Figure 3 (of 9% and 27%) understate what could happen in practice.

The design of a Passive Remedy would present considerable practical challenges

If Ofcom proceeds with the imposition of a passive remedy, the design of it would be critical – and would likely present significant challenges. As we have highlighted in this response, there is a material risk that any passive remedy imposed could be 'gamed' for commercial gain, rather than facilitating innovation or improving efficiencies. Further, it could lead to other unintended consequences such as a disruptive re-balancing of BT's cost recovery and inefficient investment.

While the design of any remedy would be influenced to an appreciable extent by the definition and structure of the markets and the assessment of competitive conditions within them, it may be possible to include safeguards against these types of effect in the remedy design. However, as Ofcom notes, any limitations to the scope or application of the remedy could present a significant risk of diluting its benefit or impact.

While we recognise that assessment of the business connectivity markets is at an early stage, we consider it likely that Ofcom will find a variation in competitive conditions by both geography and product type – which appears to be Ofcom's expectation also.²⁹ If this proves to be the case, it is likely that Ofcom will be unable to impose remedies in certain markets due to their competitive nature – with the implication being that any passive remedy would only apply in certain geographic areas and to certain products.

Whilst, in theory, this may mitigate some of the risks of distortion of investment incentives and disruption to competitive dynamics, we consider that in practice it will be very difficult and extremely costly to enforce. For example, we understand that proponents of passive access have cited (fixed and mobile) backhaul as a key use to which it would be put. This type of connectivity solution tends to cover (relatively) long distances – quite possibly extending across competitive and non-competitive areas. It is not clear, therefore, how such conditions would be reflected in the enforcement of any remedy.

Similarly, it is likely that within any given geographic area, there will be a variation in competitive conditions by type of product – in particular by

²⁹ Business Connectivity Market Review: Preliminary Consultation on Passive Remedies, 5th November 2014, paragraph 6.14



capacity or speed of service. This could mean, for example, that the market segment for higher speed products is deemed to be competitive, whereas the lower speed segment is not (as is the case today for AI/MI services in the WECLA). Given that passive remedies in this context generally provide, by their very nature, for rudimentary access with no particular capacity or other designated service criteria, it remains unclear how Ofcom would safeguard against them being used to provide services in competitive market segments. We consider that identifying, monitoring and enforcing the downstream uses to which passive inputs were being put would be extremely difficult and costly. For example, without (potentially formally) requiring purchasing CPs to self-verify the uses to which they are putting passive inputs, it would in effect be impossible to establish those uses.

Aside from the challenges of containing the use of any passive remedy to the markets for which it was intended, we question the value of a 'partial' application. It is likely that the greatest benefit would be derived from a passive remedy where it was able to be used in the provision of a broad spread of products and across a wide range of geographic areas (and thus enable purchasing CPs to realise economies of scale, in both consolidating use of passive inputs and, for example, in purchasing their own active electronics to create downstream products). We believe that the likely limited scope of any passive remedy in the UK business connectivity markets would not deliver sufficient benefits or be particularly useful. In this regard, we also note that, should the outcome of the forthcoming market review be similar to the findings in the previous review, the market segment in which there is greatest apparent demand for passive access is likely to be deemed competitive.

In summary, it is unlikely that Ofcom would be able to impose a ubiquitous or broadly scoped passive access remedy, available for use in providing multiple business connectivity products and across all geographic areas. There is no 'one size fits all' approach: at best Ofcom may be able to impose a passive remedy in limited geographic areas and in specific market segments. However, we question the usefulness of a remedy imposed on this basis and believe that its implementation and the enforcement of legitimate usage of it would be complex and costly.

Implementation Challenges

Aside from all of the other factors, Ofcom must be sure that the benefits delivered by a passive remedy outweigh the considerable challenges and cost/resource burden that would be incumbent in the implementation process.



Previous experience suggests that introducing a new type of remedy brings with it a significant need for management, oversight and intervention by both the regulator and industry.

The challenges will be technical, operational and administrative. For example, previous experience shows that LLU took several years to implement, culminating in the need to establish an independent body (the OTA) to oversee its introduction. The implementation of the PIA remedy was contentious from the outset; it was delayed, there was extensive and lengthy disagreement over the Reference Offer/Terms and Conditions and operational aspects could not be agreed between BT and industry, leading to a need for Ofcom to intervene, including on pricing.

Contrary to what Ofcom suggests, the fact that the PIA remedy (and accompanying processes/arrangements) is in place may not be particularly helpful. It has never been used at scale and therefore has not been 'stress tested'. In addition, the PIA framework may not be readily adaptable to accommodate dark fibre or for more extensive access to infrastructure. It was established to satisfy the specific requirements of the PIA remedy – such as access to BT's duct and pole assets and within the bounds of NGA access networks/SLU backhaul to MDF sites only. It does not, for example, cater for the broader extent of BT's network estate beyond the access leg (an extension which would likely introduce considerable additional complexity and scale) or for anything more than the provision of rudimentary physical assets.

Moreover, as has become apparent from experience of the PIA remedy, imposing such a requirement on a network that has not been designed or deployed to accommodate shared access presents significant challenges – and arguably results in a product that has very limited attraction to purchasing CPs.

Further, any implementation period is unlikely to be short. It would need to allow not only for the design and launch of the product, but also the necessary changes to regulatory arrangements. We note also that some of the market segments in question are nascent and/or evolving at pace. There is a risk therefore that competitive conditions could be different by the time any passive remedy is available to use in practice.

In summary, in considering the imposition of a passive remedy in the Business Connectivity market, Ofcom must be mindful of the fact that any benefits that are derived from such a move will be tempered, in Virgin Media's opinion to an appreciable extent, by the considerable practical and logistical challenges presented by its introduction.



Conclusion

Virgin Media does not support the introduction of passive remedies. The claims of more innovation appear overblown and can anyway be achieved with active remedies and better processes. If passives are introduced and bought, we believe it will be because existing buyers of active backhaul products will want to save money by taking advantage of an arbitrage opportunity. This will be detrimental to buyers of lower capacity links and investors in inter-platform competition and, ultimately, consumers. Further, the introduction and ongoing management of such remedies will give rise to a high regulatory burden, impacting both Ofcom and CPs.

If Ofcom is minded to proceed with the imposition of passive remedies, we believe that the negative effects can be mitigated by geographical and product specific limitations on the use of passive remedies and the deployment of value minus pricing. In combination these mitigants will likely reduce the demand for passive products to a negligible level. The question for Ofcom must then be: why bother?



Section 2 – Answers to Ofcom’s specific questions

Question 1: Do you agree with our preliminary framework for considering the case for passive remedies?

Virgin Media generally agrees with the framework proposed by Ofcom. However we believe there is a more fundamental question that Ofcom must answer at the outset: what problem is Ofcom trying to solve and what is the outcome sought? Depending on the answer to that, Ofcom must satisfy itself that such an intrusive and disruptive intervention is justified, taking into account in particular the significant negative effects that we have identified in this response.

Question 2: Do you agree with our preliminary views on the potential benefits of passive remedies? Please provide evidence to support your view.

The candidate list of benefits is appropriate, however we are sceptical of the magnitude of any of them:

- *Innovation*: if there material incremental innovation benefits from access to passives (we doubt) then these can also be garnered from an improved SoR process.
- *Productive efficiency*: will the buyers of passive remedies really be able to buy, install, monitor and maintain their electronics cheaper than BT? We doubt that this will be the case. However, if Ofcom were to introduce a passive remedy, it could at least ensure that it would deliver efficiency benefits by adopting value-based pricing such that it would only be attractive to purchasers who were more efficient than BT or who could deliver better services for their end-users (from whom they could presumably extract some benefit).
- *Withdrawal of regulation*: given a) the likely timescale necessary to introduce any passive remedy and b) the likely desire on the part of CPs that active remedies continue into the foreseeable future we suggest that the benefit of any removal of regulation (if it happens) will occur so far into the future as to make it irrelevant to any weighing of the costs and benefits of the introduction of passive remedies. [As Ofcom notes in paragraph 3.5, it does not intend to have a ‘passives’ only option in its list of comparators]. In this regard we would emphasise in particular the considerable regulatory burden presented by the maintenance of both active and passive remedies during that transitional period.



In short, we are not convinced that material benefits will flow from the introduction of passive remedies.

Question 3: Do you agree with our preliminary views on the impacts and risks of passive remedies? Please provide evidence to support your view.

Question 4: What are your views about the potential impact of passive remedies on the pattern of common cost recovery and the associated distributional impacts?

Yes. We submit that the evidence from the introduction of passive remedies throughout Europe is that they do dent the incentives to invest in infrastructure and therefore the benefits that inter-platform competition brings. Furthermore, we believe that the clamour for access to dark fibre is prompted by the (legitimate) desire on the part of the mobile operators to reduce the cost of running and expanding their fourth generation networks. Faced with an option to self-provide high capacity links at a cost below that currently charged by BT, the mobile operators will expect BT to respond by reducing the cost of its active products thereby permitting them to achieve their aim without the need to invest in the new 'contestable' parts of the product. This is not competition on the merits, but just a way of shifting costs onto other purchasers of leased line products. We show in our response why we think that this effect could be material, potentially doubling the cost of connecting a 10Mb EADLA circuit from around £1,000 to £2,000.³⁰

Question 5: Do you agree with our initial view that mobile backhaul and fixed broadband backhaul are likely to be the primary applications with significant demand for passive remedies?

Yes, we think that purchasers of high capacity backhaul are hopeful that they will be able to reduce their costs (through taking advantage of an arbitrage opportunity).

Question 6: What benefits might duct access offer over dark fibre and vice versa? Is there a case for having both remedies?

We believe it is premature to consider this point at the present time. Of more importance in the first instance is the fundamental question of whether it is appropriate to impose a passive remedy per se.

³⁰ See Table 2, above.



Question 7: If passive remedies were restricted to particular product types or geographic areas how might this affect the usefulness and benefits of the passive remedy?

As we have set out above, it is our expectation that one of the key attractions of passive remedies would rest in the ability to use them in the provision of a wide range of services and geographies. Notwithstanding the difficulties in enforcing any restriction on the use of passive inputs, the inability to use them in end-to-end product delivery would likely significantly undermine the usefulness and benefits of them.

Question 8: What arrangements would be appropriate for the supply of new infrastructure for passive remedies?

We have no comments at this stage.

Question 9: Do you agree with our initial views about the non-discrimination arrangements for passive remedies?

Ofcom identifies that there is a need to ensure that BT does not discriminate in the provision of passive remedies between its own downstream divisions and third party purchasers. It is absolutely essential that adequate protection is in place, especially if active and passive remedies are to co-exist. Ofcom is rightly concerned that an asymmetry in regulatory approach between active and passive remedies could lead to BT Group being able to favour one remedy over the other to the detriment of wider competition. Equally, as passive access forms a part of the supply of an active product the imposition of strict EOI obligations could require BT to consume a passive remedy as an input for the provision of active services, which Ofcom believes is disproportionate. The complexity of trying design a new layer of passive regulation to sit alongside active regulation is yet another example of the high regulatory cost of this remedy, and as suggested in our response above, we consider that this high cost is not justified by potential (but unclear and unrealised) benefits.

Question 10: In light of the trade-offs identified, which broad options on pricing do you consider would be most appropriate for passive remedies and why? Please also provide details if there is another pricing approach you consider would be appropriate in light of the considerations identified in this section.

Question 11: If a value-based (active minus) approach to pricing dark fibre were adopted, what do you think would be an appropriate active wholesale product (or products) to reference?



We do not support the introduction of passive remedies. However, if Ofcom does pursue their introduction, it appears to us that value-based pricing could at least flush out whether there are benefits from passive remedies beyond the private benefit to buyers from an arbitrage play, provided it was appropriately designed. With such value-based pricing only those who could supply the contestable parts of the service cheaper or 'better' than BT would be attracted to passive remedies. We strongly suspect that, under value-based pricing, the demand for the latter would be minimal and therefore consequential adverse distributional consequences from BT's need to recover more of its common costs from other products would be mitigated³¹. Even, aside from the practical difficulties in designing a practical value based pricing control, it is then of course arguable whether all of the effort required to introduce a passive remedy would be worthwhile.

Question 12: Do you have any other comments on the issues raised in the document or comments that might aid our consideration of the passive remedies as a whole?

We have no additional comments.

Virgin Media
9 January 2015

³¹As Ofcom notes in paragraph 1.18: "The overall impact on the pattern of BT's charges would depend on the design and scope of any passive remedies we may impose."



Annex

Procedural Considerations and Ofcom's Statutory Obligations

Notwithstanding our broader concerns relating to the effects and consequences to which a passive remedy could lead, we consider there to be some significant practical challenges in imposing such a measure. Above all, it remains unclear how a passive remedy would be implemented. For example, would passive access obligations be imposed as a remedy in existing markets or as a remedy in a revised or newly defined market(s)?

As Ofcom notes, it is subject to a statutory duty to review competition in certain markets periodically, in accordance with the EU regulatory framework. The framework sets out a 3-stage, sequential approach, consisting of defining the relevant markets, assessing the state of competition in those markets (including whether any operator has significant market power (SMP)) and, where there has been a finding of SMP, imposing appropriate remedies to address the competition problem identified. Conversely, where no SMP is found, remedies may not be imposed.

Under the current market structure, certain markets have been found to be effectively competitive, with no provider having SMP (and, assuming this structure is maintained, this is likely to continue to be the case for the forward looking period of the forthcoming review). Accordingly, no remedies have been (or are able to be) imposed. These competitive markets include those in which demand for passive remedies is likely to be greatest.

The current suite of active remedies supports the existing market structure and it is unclear how a passive remedy might be accommodated, given that where competition problems have been identified, the active remedies have been designed to address them. In this regard we are not aware of evidence of a material change to the competitive issues in these markets since the last review that would justify a change to the type of remedy from active to passive or the introduction of passive remedies alongside existing active remedies – or indeed a change in Ofcom's position that passive remedies are not necessary or appropriate.

This suggests that it may be necessary to make changes to the existing market structure and definitions as an alternative means to facilitate the introduction of passive remedies. This would, in our view, be highly disruptive for both Ofcom and CPs and we do not believe that there have been any developments to justify such an approach. However, if Ofcom is to establish a market that does not feature in the European Commission's list of markets susceptible to ex-ante regulation (which would likely be the case for a dedicated passive product market(s)), and impose remedies in it, it would



need to demonstrate that it met the 'three criteria' test and thus warranted the application ex-ante regulation. The meeting of these criteria is not a foregone conclusion and may prove particularly challenging given the general need to demonstrate a market failure – of which we see no evidence. Moreover, even if the three criteria test could be passed, a change to the market structure and/or the introduction of new markets could be highly disruptive to the current competitive dynamic. It would also come with a high regulatory burden, requiring significant input and support from Ofcom and CPs to effect changes to important aspects of current regulation and to implement new elements.

Regardless of the question of whether it is appropriate (or possible) to impose a passive remedy, we note that in determining what remedies to impose in a particular case, Ofcom must adhere to various principles and comply with a number of obligations. For example, EU law, and in particular Article 8 of the Framework Directive, requires NRAs to ensure that the measures they impose on undertakings found to hold SMP are justified in relation to the objectives set out in Article 8 of that Directive and are proportionate to the achievement of them. Put another way, any obligation imposed by an NRA must be proportionate to the problem to be remedied. Similarly, UK legislation requires Ofcom to take into account various factors in determining what remedies to impose in a particular case.³² In the case of access remedies these include:

- (a) the technical and economic viability, having regard to the state of market development, of installing and using facilities that would make the proposed network access unnecessary;
- (b) the feasibility of the provision of the proposed network access;
- (c) the investment made by the person initially providing or making available the network or other facility in respect of which an entitlement to network access is proposed;
- (d) the need to secure effective competition in the long term;
- (e) any rights to intellectual property that are relevant to the proposal; and
- (f) the desirability of securing that electronic communications services are provided that are available throughout the Member States

³² The Communications Act 2003, section 87, concerning the imposition of conditions relating to network access



In the context of the potential imposition of passive remedies, we consider that factors (a) and (c) in particular constitute a very high threshold. In order to impose passive remedies, Ofcom would need to satisfy itself to that threshold (and demonstrate) that the benefits would significantly outweigh the negative implications. As we have stated in this response, we do not believe that this would be the case. In particular, the current state of the markets and competition do not, in Virgin Media's view, justify the imposition of passive remedies. Fundamentally, we see no evidence of a market failure that would warrant this. We are not aware of any evidence of innovation being held back to the detriment of either CPs or consumers, and to the extent that there is a desire to enhance innovation and increase efficiency, we believe that this can be achieved through the adaption of existing active remedies.

Further, we believe that imposing a passive remedy would undermine investments not only of the party to whom the remedy would apply, but also to investors in infrastructure generally. In this regard we note that Ofcom recognises that if the consumption of passive inputs from a third party provides a lower cost or lower risk route to market than self-build, this will change the future returns on past self-build decisions and (other things equal) reduce the incentives for future self-build. We consider there to be a very real risk that the imposition of passive remedies will significantly inhibit the prospect of further independent infrastructure investment and deployment and thus of infrastructure based competition.