Towerhouse LLP

Geographic market analysis in the BCMR

A RESPONSE TO THE CONSULTATION ON BEHALF OF THE COLT, SKY, TALKTALK AND VODAFONE

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Executive Summary

1.1 This response to the BCMR consultation discusses issues relating to Ofcom's geographic analysis and to the competition assessment of CISBO services in the Central London Area ("CLA"). Overall, we consider that the analysis and proposals in the consultation represent a step in the right direction, and produce a much more recognisable map of competition in the UK, but in many respects Ofcom has not gone far enough.

1.2 This response focusses on two sets of issues:

- The competition assessment in the CLA. Whilst we welcome the fact that Ofcom has recognised the unique nature of competitive conditions in the centre of London, competition for CISBO services is not yet fully effective even in this most competitive of areas. Ofcom's analysis of competition in the CLA is flawed largely due to the over-reliance on network reach estimates. Regulation continues to be needed to ensure that customers less well served by competition[1] are still able to benefit from competition in downstream markets based on regulated access to BT's network.
- Improvements to the geographic analysis. There are a number relatively minor changes that Ofcom should make to its geographic analysis to generate more robust conclusions in both market definition and competition assessments. For example, we support the decision to reduce the buffer distance to a more credible figure of 100 metres, but still consider this to be too high in most circumstances. For all except the very highest bandwidths, competitors will not provide an effective constraint on BT at this distance for customers requiring just one, or a small number, of circuits.

Competition in CISBO services in the CLA

1.3 Deregulation in the CLA is the most notable proposal in the market review. There is no Ofcom precedent for what amounts to full deregulation of an entire product market on the basis of effective facilities based competition. Ofcom has deregulated many markets before, but these have either been underpinned by competition based on regulated access to BT's network in upstream markets (e.g. market B in the WBA market review), or relate to a small product niche (e.g. MISBO in the WECLA).

1.4 Regulated access to BT's network guarantees comprehensive coverage of competing services. In contrast, the coverage of facilities based competition is limited by the economic viability of competitors extending their networks to reach end user premises. For any given area, leased line competitor network coverage tends to be less than comprehensive, and often quite sporadic. As such, there is a risk that the distribution of competition is highly uneven, with some customers having very limited choice of supplier.

1.5 Ofcom's assessment of competition in the CLA is flawed in three respects:

[1] Such as customers offering relatively low contract value, and those located furthest from competing network infrastructure.

- First, it makes the implicit assumption that the potential to supply is equivalent to a competitive constraint. Very simply, this relationship will not hold in all circumstances.
- Secondly, it places too much emphasis on a single uncertain estimate of potential supply. Elsewhere, Ofcom notes that caution is required in placing weight on the prospects for competition,[2] yet this is precisely what Ofcom has [not?] done in relying so heavily on the network reach metrics.
- Finally, there is a variety of evidence which Ofcom has not taken into account which indicates that BT continues to have SMP. A more complete investigation would reveal that, despite the presence of many suppliers in the CLA, there is wide variation in the intensity of competition according to the customer's demands and the location of their premises.

1.6 There are a number of reasons why potential supply, as measured by the presence of a network flexibility point within 100 metres of a customer site, will not necessarily translate into a competitive constraint on BT:

- Even at distances significantly lower than 100 metres, OCPs are unlikely to be competitive supplying a customer requiring just a single circuit at bandwidths of 1Gbps and below,[3] and certainly will not be competitive for a 100 Mbps connection. The costs of the required network extension[4] would be difficult to recover whilst maintaining a competitive price level. The reductions in Ethernet prices proposed in the charge control will exacerbate this effect.
- Even where a competitor is much closer to the customer, establishing the final connection to the customer premises can be difficult and expensive in London. In particular, wayleaves often create complications for competitors that are not faced by BT. These complications arise sufficiently often to have a material effect on competition.
- Some suppliers offer a less than comprehensive range of services, and therefore do not offer a direct constraint on BT throughout the market. In particular, not all CPs supply services to wholesale customers.
- Customers often distinguish between operators on the basis of factors relating to the supplier's scale outside the CLA. For example, in relation to LLU and MNO backhaul, there is a preference for suppliers who can offer connectivity across a wide geographic area.

[2] "The limited investment in network infrastructure by OCPs suggests that caution is warranted when placing weight on the prospects for competition in market power determinations." A13.101.

[3] The exception is very low bandwidths where EFM may be used. Our discussion relates to fibre based services.

[4] Which would be somewhat longer than 100 metres on average due to the difference between route length and straight line distance.

1.7 We believe these factors explain why BT's market share has remained above the usual 40% SMP threshold in the CLA despite the presence of many competing networks, and why it continues to be able to set nationally uniform prices.

1.8 One important piece of evidence that Ofcom has not used in its competition assessment is the data collected regarding fibre connected buildings. We expect this would show that BT is connected to far more buildings than other CPs – even in the CLA. This may be important for a number of reasons, but we highlight the effect it can have on competition through the asymmetry of switching costs.

1.9 BT is the only supplier at a large number of sites. In these circumstances, any change in supplier necessitates a new network connection, which inevitably causes disruption for the customer. In contrast, when CPs connect to a site they will invariably be an additional supplier. Once connected, a customer in the relevant building can then change supplier without incurring the switching costs associated with a new network connection.

1.10 Switching costs tend to entrench market power over a supplier's installed customer base. The connected buildings evidence would show that BT's customers will, on average, face higher switching costs than its competitors. This provides a further explanation as to why BT's market share remains high, and further evidence suggesting that BT continues to have SMP.

1.11 Ultimately, we consider that whilst competition may be effective for some customers and some bandwidths in the CLA, BT continues to have SMP in the CLA across the CISBO market as a whole.

Geographic market analysis

1.12 In our previous paper on the subject of geographic market analysis in the BCMR,[5] we recommended the following relatively straightforward changes to the methodology used to define geographic market boundaries:

- To change the manner in which alternative modelling assumptions are assessed;
- To combine existing demand locations with the large business site database in the measurement of network reach;
- To reduce buffer distance to a more realistic level; and
- To differentiate between network operators.

1.13 We welcome the fact that Ofcom has reduced the buffer distance, although 100 metres remains too high in many circumstances. All the remaining recommendations are needed to produce more robust analysis and conclusions. In particular, the large business dataset used by Ofcom is likely to be a poor predictor of the location of mobile base stations which are a major source of

[5] "Geographic market definition in the BCMR", Towerhouse LLP, February 2015, http://stakeholders.ofcom.org.uk/binaries/telecoms/market-reviews/Geographic_market_definition_Towerhouse.pdf.

leased line demand. This simplest way to correct this failing would be to augment the large business site database with the location of current leased lines.

1.14 We also consider that Ofcom should differentiate between suppliers in a manner analogous to the use of "Principal Operators" in Ofcom's Wholesale Broadband Access market reviews. At present, Ofcom's market definition analysis treats all CPs the same, with each competitor modelled as a set of flexibility points. In reality, some suppliers choose to focus on particular customer or product segments, and therefore will not create the same competitive constraint on BT relative to a supplier who offers a full range of services.

1.15 The remaining recommendation can be summarised as a need to take account of the uncertain nature of the metrics used to assess BCMR markets. In essence, all the metrics are estimates of features of the market. For example, Ofcom's network reach metrics provide an estimate of potential supply. When Ofcom states that 93% of businesses are within 100 metres of at least 4 suppliers it should be understood that this is not a direct measurement, but an estimate.

1.16 This estimate is based on a number of assumptions, calculations, and the data that was made available to Ofcom. A change in any of these inputs could result in a materially different value for the relevant metric. This is clearly important given the weight that Ofcom places on its network reach metrics in particular.

Improvements in the BCMR analysis

2.1 Our overall reaction to the proposals in the BCMR consultation is positive. Many of the changes represent a significant improvement relative to the previous business connectivity market reviews, and result in a much more recognisable picture of leased lines competition in the UK.

2.2 In particular, we would highlight the recognition that there is an area in central London which is both qualitatively and quantitatively different from the rest of the UK. It contains an unrivalled density of businesses which stretches across a relatively broad area (relative, that is, to any other city in the UK), and this has attracted a large number of leased line suppliers to build network infrastructure in this area.

100 metre buffer distance

2.3 The adoption of 100 metres as the buffer distance in the Central London Area is a significant improvement. However, as acknowledged by Ofcom, even with network facilities 100 metres from a customer's premises, there will be many cases where a supplier will struggle to compete with BT. We discuss this point further in section 3 below, and recommend that Ofcom needs to understand these circumstances in more detail.

2.4 In particular, it is important for Ofcom to understand whether there is any systematic element to the reasons why a supplier would find it difficult to compete. For example, we suggest that customers buying a small number of circuits, and certainly those buying just a single circuit will be relatively poorly served by OCPs even where they are 'within reach' of OCP network infrastructure.

Greater reliance on network presence

2.5 We agree with the emphasis on the presence of competitive network infrastructure. It is a prerequisite for competition in leased line markets. All other factors are subsidiary to this requirement. It is therefore appropriate that it should be the key driver in identifying areas of competitive homogeneity to define sub national market boundaries, and also a key determinant in the competition assessment.

2.6 However, as discussed below, it is vital that Ofcom develops a better understanding of the circumstances under which network presence does, and does not, equate to being a viable competitor. The data on fibre connected buildings is likely to be an important piece of evidence in developing this understanding since it shows where competition has actually developed relative to the potential for competition as measured by network reach.

More realistic product market boundaries

2.7 The broader product markets adopted in the consultation allow for a more realistic description of competitive conditions. In particular, the distinction between AISBO and MISBO in the previous market review was difficult to reconcile with experience in the market. Price, bandwidth and quality of service are the characteristics that most concern customers. Beyond delivering a service with the required interface to connect to the customer's network

equipment, the specific transmission technology used by the supplier is unlikely to be a major consideration for the majority of customers.

Greater emphasis on structural links between geographic areas

2.8 We welcome the inclusion of an explicit consideration of structural factors that affect competition in different areas. In equal measure, we also agree with the diminished reliance on contiguity to define market boundaries.

2.9 The decision to build network to enter the market and supply leased lines cannot be made on the basis of a single customer premise. The economies of scale and scope associated with business connectivity services imply that a sustainable business will need to maintain a high density of customers in a particular area.

2.10 In addition, a different network architecture is required to supply circuits over long distances compared to supply within a small urban area. Over long distances, a hierarchical network architecture is needed with aggregation of traffic over 'trunk' or 'backhaul' routes. Within a local 'access' network, no such aggregation is required, and circuits can be supplied using dedicated point to point fibre between customer sites.

2.11 These factors tend to suggest that subnational geographic markets should be of a reasonable size (in terms of the demand rather than geographic area), and should consist of areas located close to each other. That is, a subnational leased line market should not consist of several geographically diverse areas[6] such as different cities. This is relevant to the assessment of central business districts other than London. We strongly agree with Ofcom's conclusions that competitive conditions in these areas are not sufficiently different from the surrounding areas to justify the definition of separate markets.

[6] This analysis is based on the supply conditions for fibre based leased lines. EFM services display different characteristics since they use LLU as an input.

Competition in the CLA

3.1 Perhaps the most striking aspect of the BCMR proposals is the finding of effective competition in the wholesale CISBO market in the CLA. This is unprecedented in UK telecoms regulation in the sense that Ofcom has never before found effective facilities based competition in a material, growing market. In effect, Ofcom has concluded that the wholesale customers of any bandwidth of Ethernet service will face competitive supply in the CLA.

3.2 With the exception of some small niche markets, all previous deregulation has been underpinned by access regulation further upstream. Regulated access to BT's infrastructure ensures that competitors have comprehensive nationwide coverage. With facilities based competition, the geographic coverage of competition is limited by the extent of competing network infrastructure.

3.3 This section questions the finding of effective competition in CISBO services in the CLA. Ultimately, we conclude that competition is patchy: for some customers at all bandwidths, and for all customers at very high bandwidths, competition may be more effective; but these groups exclude the majority of the market, and so across the market as a whole, BT continues to have SMP. Therefore, regulation is still required to create a safety net and ensure that all downstream customers who are less well served by competitor networks can still benefit from competition based on regulated access to BT's network.

3.4 The evidence presented by Ofcom in its competition assessment is inconsistent, with some factors suggesting there may be effective competition and others indicating that BT has SMP. Ofcom has not offered an explanation of these inconsistencies, but simply placed greater weight on the evidence suggesting that there is effective competition.

3.5 In this section we discuss three points which help to explain the inconsistency, and suggest that Ofcom has reached the wrong conclusion regarding competition in the CLA:

- First, the mere existence of a supplier in an area does not always mean that they will provide an actual competitive constraint on BT;
- Secondly, potential supply as measured by network reach is flawed; and
- There is additional evidence that Ofcom has not taken into account.

3.6 Before discussing these points, we note the importance of geographic market definition in the competition assessment. This creates a methodological issue which could potentially lead to the standard of assessment for SMP analysis being lower than is required.

Contradictory evidence

3.7 The key points of evidence considered by Ofcom as part of the competition assessment are as follows:

- Very high network reach in the CLA: 93% large business sites have 4 or more competitors to BT with network within 100m, and 98% of large business sites have 5

or more competitors within 200m. On average[7] there are 6.2 competitors within 100m of large business sites.

- The unparalleled density of businesses in the CLA creates a very high density of demand for CISBO services, making it a particularly attractive area for new entrants.
- Ofcom's estimate of BT's share in CISBO is 44%. But this share varies significantly according to bandwidth – from 55% for 100Mbps services down to around 10% for services above 1Gbps – and by customer segment, with BT likely to be supplying over 80% of mobile backhaul circuits[8].
- BT sets nationally uniform prices for CISBO services.
- Ofcom's estimates of BT's profitability suggest it earns well in excess of its cost of capital on AISBO services in the WECLA. It is reasonable to suppose that its profits on CISBO services in the CLA will be similarly high.

3.8 As Ofcom notes, this evidence is contradictory: the network reach measures and business density indicate that competition has the potential to be effective; but BT's market share, its pricing policy and profitability indicate that it continues to have SMP.

3.9 Ofcom reaches its non SMP conclusion by placing greater weight on network reach on the basis that "this goes to the fundamental prospects for sustainable competition". Elsewhere Ofcom suggests that "caution is warranted when placing weight on the prospects for competition in market power determinations" due to the limited investment in network infrastructure by OCPs[9]. As we discuss below, the network reach metrics are merely estimates of where OCPs might be able to supply subject to the necessary network investments to reach customer sites. Therefore, placing greater weight on network reach is equivalent to placing weight on the prospects for competition through OCP network investment. On this basis we do not believe that the additional weight on network reach is justified.

3.10 Also, the inconsistency in the evidence raises the question why, in the presence of such a large number of competitors, BT able to maintain such a high share of a growing market, without pricing aggressively, and whilst making high returns.

3.11 It would certainly be reasonable to interpret these contradictions as evidence of SMP, and on that basis to conclude that BT continues to have SMP in the CLA. We believe that this is a considerable gap in Ofcom's analysis, and before reaching its conclusion about the level of

[7] This is an average of the postcode sector level network reach measure, which itself is an average across each of the large business sites within each postcode sector. As such, the 6.2 figure is a weighted average of the number of networks within reach of all large business sites within the CLA. Even within the CLA where postcode sectors are all relatively small, the size of the postcode sectors varies, both in terms of area and the number of premises within the sector. As such, it is not clear whether this weighting will result in a figure which is higher or lower than the unweighted population mean.

[8] As presented in table A15.11, BT's share of AI services in the WECLA was 89% if microwave services were excluded, and 83% including microwave.

[9] A13.101.

competition, Ofcom needs to understand why competitors have not made greater inroads into BT's market share or forced BT to reduce its profitability in this market.

3.12 We discuss a number of factors that help to explain this situation under the following headings:

- Potential supply will not always deliver actual competition;
- Potential supply as measured by network reach is flawed; and
- Additional evidence that Ofcom has not taken into account.

Potential supply will not always deliver actual competition

3.13 In essence, Ofcom's position is that an average of more than five or more potential suppliers in addition to BT ought to be sufficient to create effective competition[10]. What is apparent from the market share data is that even such a high number of competitors does not appear to translate into actual competition for all customers and at all bandwidth segments. For example, BT's share of medium bandwidth CISBO, which most often equates to 100Mbps services, is estimated to be 55% in the CLA. Far from being a niche, 100 Mbps services currently form the largest proportion of volume in the market, and this position is expected to continue throughout the review period.

3.14 There is further evidence of the poor correlation between the number of potential suppliers and market share (as a proxy for competitive intensity) in that BT's share in the CLA is not materially different from its share in the London Periphery ("LP") and in other central business districts. These service shares reveal an important characteristic of competition in the CLA: that it is focussed very heavily on higher bandwidth services.

Product segment/network reach	CLA	LP	CBDs in other cities
Average network reach (100m)	6.2	2.4	2.8
Low CISBO	41%	44%	40%
Medium CISBO	55%	57%	54%
High CISBO	34%	44%	47%

Figure 1 BT's service share for CISBO services and competitor network reach[11]

3.15 Given the margin of error in these service share estimates, there is unlikely to be a statistically significant difference between the areas for low and medium bandwidth services, and between the LP and other CBDs for high bandwidth CISBO. Equally, the network reach metric is broadly the same between the LP and CBDs. The two interesting statistics are the high network reach in the CLA and BT's reduced share of high bandwidth CISBO.

[10] Ofcom also uses a slightly weaker condition of an average of 4 suppliers as long as no more than 10% of customer have only one alternative supplier to BT.

[11] From Table 4.4, BCMR May 2015 Consultation.

3.16 As we discuss in the following section, there are reasons why competitors with network in close proximity to a customer site will not act as a competitive constraint on BT throughout a broadly defined product market like CISBO. That is, adding more competitors will not necessarily even out the distribution and fill in any gaps: more suppliers creates more competition where it already exists and leaves gaps where it doesn't.

3.17 The presence of a supplier does not always imply that they are able and willing to compete to supply relevant services. Some suppliers offer a comprehensive range of services to both wholesale and retail customers, and therefore compete with BT throughout the market wherever their network is present. The same is not true of all operators. These factors tend to affect every competitor, and therefore the number of competitors is not a good indicator of the distribution of competitive intensity. For this reason, we consider that Ofcom should distinguish between "Principal Operators" who are capable of constraining BT throughout the market, and other suppliers who either focus on a particular product or customer niche, or who are not perceived by customers as being a credible replacement for BT. We discuss this suggestion in more detail below from paragraph 4.2 onwards.

Potential supply as measured by network reach is flawed

3.18 Ofcom's network reach metrics are uncertain estimates of potential supply. It is important to remember that these are not, and cannot be, actual measurements. They represent a prediction of the number of operators that may be able to compete to supply potential leased line customers. Ultimately, Ofcom places too much weight on a single, uncertain estimate.

3.19 As we argue in section 4 below, the network reach metric could be improved as an estimate of potential supply, and therefore made more robust, by:

- Differentiating between principal operators and niche operators; and
- Supplementing the large business site location with current locations of leased line demand.

3.20 However, even with these adjustments, network reach will still tend to overstate potential supply.

100m dig distance overstates supply for single circuit customers

3.21 First, and quite simply, for customers requiring a single CISBO circuit, for all except very high bandwidths, the costs of a network extension anywhere approaching 100 metres would be prohibitive. As Ofcom's own analysis shows, a CP seeking to recover the costs of a 100 metre dig over a three year period would need to charge approximately £4,000 per year. The costs in the CLA would be substantially higher. Also, since Ofcom's 100 metre buffer is measured in a straight line, and the network will follow roads and footpaths, the dig distance may be somewhat more than 100 metres.

3.22 Where this circuit is part of a large contract for connectivity across a number of sites, the supplier may be able to cross subsidise and recover the costs elsewhere. However, if they are limited to a single circuit, it is difficult to see how the supplier could price at a competitive level and recover all of its costs.

3.23 Given that Ofcom's competition assessment is forward looking, it is important that Ofcom take account of the reductions in price proposed in the leased line charge control. In effect, these reductions will further reduce the viable dig distance for OCPs.

Connection to the customer building is not always possible

3.24 Suppliers often face additional hurdles to connect to customer premises. This is a particular problem in central London which has many multi-tenanted buildings. As such, the customer does not own the building, and cannot grant rights for the supplier to access the building and create a new connection. The supplier must therefore obtain a wayleave to allow the necessary works.

3.25 Wayleave negotiations can take a significant amount of time, and are not guaranteed to be successful. In some cases, the landlord charges a rent to access the building, thus adding to the ongoing costs for suppliers in that building.

3.26 In contrast, BT is almost always already connected to buildings, if not with fibre, then with copper for PSTN services. As such, it faces wayleave issues much less frequently than competitors.

The cost of civil works are sometimes significantly higher than the average in CLA

3.27 The cost of civil works is often higher in London due to a range of factors, and this contributes to a higher average cost relative to other urban areas. In addition, however, there are extreme cases in which costs will be prohibitive, and hence supply will not be forthcoming. For example, footways are increasingly congested and on occasions there is no space for additional ducts beneath the pavement. As such, CPs are forced to use the carriageway, which is far more expensive and may require traffic diversions and night time working. In some cases, these additional costs could be justified, but for a typical CISBO circuit, it will imply that the supplier cannot connect to the customer's site.

Additional evidence that Ofcom has not taken into account

3.28 In this final subsection we consider the evidence that Ofcom has not taken into account in its assessment of competition in the CLA. Some of these have already been discussed, for example, Ofcom has not taken account of the differences between operators, and has not factored in the impact of the price reductions proposed in the charge control. In addition, we believe Ofcom should consider:

- Market share trends;
- Evidence on fibre connected buildings and its effect on switching costs; and
- Benefits of extensive network reach.

3.29 These factors, in conjunction with those already discussed, help to explain why competition is not as effective as the network reach statistics suggest.

BT's market share

3.30 Ofcom has not considered trends in BT's market share. Market share trends are often more informative indicators of competitive intensity than point estimates. For example, as Ofcom notes in Annex 13:

> *"[w]here an undertaking maintains a high share over time, this provides further support for impediments to effective competition being present."*[12]

3.31 Even a relatively high share above the typical 40% threshold for SMP will not necessarily be indicative of market power if that share is falling. Equally, a low but persistent share in conjunction with other indicators such as high profitability may be evidence that an undertaking has market power. This may occur, for example, where customers are locked in through the effect of switching costs.

3.32 Although we do not have historic data for BT's share of CISBO services in the CLA, we can estimate BT's share of AISBO services in the WECLA as presented in Figure 2. There are many caveats to be made about these comparisons since each data point was produced using different sets of assumptions. However, it is reasonable to conclude that BT's share has not changed very much since 2007. Given the high proportion of WECLA volume which resides in the CLA, it also seems reasonable to draw the same conclusion for BT's share in the CLA.

Year the data was collected	BT AISBO WECLA share estimate
2007	c. 47%
2011	45-55%
2014	c. 47%

Figure 2 BT market share estimates in the WECLA (source – Ofcom BCMR documents)

3.33 This is important because the network infrastructure in the CLA is relatively mature. There has been very little material network investment in this area for at least a decade.[13] Potential supply, at least in terms of network reach, has changed very little over that period. Therefore, we should not expect BT's share to fall from its current level due to the effect of recent entrants still finding their feet. BT's share would appear to be the outcome of relatively stable competitive conditions, and therefore even more demanding of an explanation.

Fibre connected buildings

3.34 In the last market review Ofcom tried to measure the number of connected buildings based on an inference from leased line inventories, and found that BT had fibre connections to more than twice the number of buildings in the WECLA as all competitors combined[14]. Ofcom has since collected actual data on connected buildings, and so could now perform this analysis more accurately.

[12] A13.20.

[13] The exception is the introduction of EFM services by LLU operators.

[14] Footnote 86 in the BCMR Consultation notes that BT provided services to 4,070 postcodes in the WECLA compared to 1,875 postcodes served by the 5 largest OCPs.

3.35 Customers in leased line markets face material and largely unavoidable switching costs. These relate to the process of switching: the disruption of arranging new network connections to a building; installing new equipment; and outages between the time when the old service is disconnected and the new service being switched on. These costs mean that customers are less likely to change supplier , entrenching BT's market power.

3.36 BT's current policy (and its policies in the past) of discounting connection costs is consistent with switching cost theory: BT wants to attract new customers by offering low introductory price, and then make positive margins on recurring revenues once the customer is connected and 'locked in' due to the inherent switching costs.

3.37 The key difference between BT and OCPs is that BT is the sole supplier connected to a lot of customer sites. In contrast, BT will usually already be present whenever an OCP connects to a site. This implies that switching costs are systematically lower for OCP customers.

3.38 This provides a further explanation as to why BT's market share remains high, and further evidence suggesting that BT continues to have SMP.

Benefits of extensive network reach

3.39 BT, and others with a more extensive network footprints, will benefit from the fact that some customers would prefer to buy a number of circuits across a range of locations. This effect will be particularly strong in relation to wholesale customers, including LLU operators and MNOs. This does not preclude the use of smaller operators, but there is likely to be a strong preference for a supplier who can meet a larger proportion of the customer's demand. This adds further support to our recommendation that Ofcom should differentiate between operators.

3.40 An extension of this logic would lead to the suggestion that BT is able to leverage its market power from other geographic markets in the UK. This may also help explain why market shares do not correlate well with network reach metrics.

Summary and recommendations

3.41 Ofcom needs to explain why, in the presence of a large number of competing networks, BT maintains a persistently high market share of CISBO services in the CLA. In particular, Ofcom needs to understand why BT controls 55% of 100Mbps services, which are likely to remain the most common bandwidth during the review period.

3.42 Given the contradictory nature of the evidence used by Ofcom to assess competition in the CLA, Ofcom should:

- Assess more evidence, including the data it has collected on connected buildings;
- Improve its network reach analysis by supplementing large business site locations with the location of current leased line demand;
- Improve the competition assessment by considering network reach for a set of principal operators;
- Consider the effect that the price reductions proposed in the charge control LLCC will have on the economics of building network extensions;

- Perform additional checks by varying the assumptions used in its network reach analysis, e.g. test network reach at the median dig distance of 40 metres; and
- Analyse network reach at the postcode level for the CLA to determine exactly which areas will be least well served by competing networks rather than relying on postcode sector averages.

3.43 In addition, Ofcom should take account of the effect of switching costs. BT has an advantage relative to its competitors due to the fact that it is already connected to a large number of buildings, and is the only supplier with a fibre connection in many of these cases. This entrenches BT's market power over its large installed base of customers.

Improving the geographic analysis

4.1 This section discusses a number of relatively minor changes to the geographic analysis that would improve accuracy, and therefore lead to more robust conclusions. In summary, we consider that Ofcom should implement the following changes:

- Distinguish between operators in the analysis for both market definition and competition assessment on the basis of differences in the impact that each operator has on competition;
- Include the location of existing demand in the modelling of potential demand; and
- Reassess all market boundaries using the latest available evidence and latest agreed assumptions.

Principal operator analysis

4.2 Ofcom has distinguished between operators in its geographic market definition for wholesale broadband services in every review since 2007. It defined a group of "Principal Operators" ("POs") who were "expected to provide a material competitive constraint during the period covered by this review."[15]

4.3 The relevant test in the WBA market was to identify CPs who planned to have reasonably extensive coverage of at least 10%. Those offering much smaller coverage were deemed to be niche operators who would only, therefore, be able to offer a limited competitive constraint.

4.4 Ofcom has since used POs as part of the process to identify competitive conditions in different local exchange areas in every subsequent market review. In the 2007/08 and the 2013 reviews, markets were classified by the number of POs present at the local exchange. In the 2010 review, Ofcom also used BT's market share to classify areas on the basis that there were appreciable differences of competitive conditions at exchanges with three POs.

4.5 We consider that a similar approach is needed in leased lines markets. Not all suppliers with network infrastructure compete across the full range of wholesale services within each product market. In particular, two distinctions are notable:

- Some operators prefer not to supply to the wholesale market (for fear of cannibalising their retail business); and
- Some CPs specialise in serving specific customer segments (such as multi-national clients), or product categories (such as higher bandwidth services).

4.6 The importance of the first point stems from the fact Ofcom's market analysis assumes that circuit ends are geographically independent of one another. The validity of this assumption depends on the ability and willingness of CPs to interconnect and purchase wholesale services

[15] 3.260, "Review of the wholesale broadband access markets 2006/07, Explanatory Statement and Notification", 15th November 2007.
http://stakeholders.ofcom.org.uk/binaries/consultations/wbamr07/summary/wbamr07.pdf

from each other. This inter-operator wholesale market does not always work well. Therefore, when a supplier is competing to win a contract to connect a number of sites across the UK, its network reach to all these sites is likely to affect its chances of success.

4.7 This has two consequences for Ofcom's network reach analysis:

4.7.1 First, within a candidate market, an important additional measure is the number of operators within reach of all the possible sites required by a customer wishing to connect a number of sites.

4.7.2 Secondly, when using network reach metrics at the competition assessment stage, the extent of an operator's coverage outside the relevant market becomes an important piece of evidence.

4.8 A closely related issue comes from the desire of wholesale customers to interconnect with a small number of suppliers. A customer incurs costs in managing additional suppliers, and therefore will often want to keep the number of suppliers to a low level. For customers requiring very extensive network coverage, such as LLU operators and MNOs, this implies a preferences for larger operators who can offer significant network coverage throughout the UK.

4.9 The result is that customers differentiate between suppliers based on factors other than their local network reach. In turn, this implies that competition depends on more than just the number of suppliers as measured by network reach in a local subnational geographic market.

Modelling potential demand

4.10 At present Ofcom models the location of potential leased line demand using a database of business sites. To improve the accuracy of this model, the database should be augmented with the locations of existing demand for leased lines.

4.11 Ofcom's measure of network reach relies on a prediction of where leased line demand might arise. Ofcom estimates this geographic distribution by using the location of sites run by larger businesses. It makes the assumption that larger businesses are more likely to buy leased lines, and so considers the locations of sites used by business which have at least 250 employees. These are referred to as 'large business sites'.

4.12 At paragraph 3.16 of our geographic markets paper[16], we argued that this step of the analysis has the potential to introduce errors into the results because the location of large business sites will not necessarily provide an accurate or unbiased estimate of the location of leased line demand.

4.13 We gave the following reasons:

- MNO and LLU backhaul represent a very significant source of leased line demand. There is no reason to believe that large business site locations will provide a good, unbiased estimate for the location of this demand. In particular, business sites are likely to be a poor estimator of mobile mast locations. Mobile coverage requirements

[16] Towerhouse LLP, *Geographic market definition in the BCMR,* February 2015.

dictate that masts will need to be distributed throughout the country, including within residential and rural areas, whereas business sites will tend to be more heavily concentrated in urban centres and business parks.

- Although large businesses are more likely to use leased lines, it is not necessarily true that leased lines will be used at every site used by these business. According to ONS data, there are around 9,080 businesses and around 11,810 sites with 250 or more employees in the UK [17]. Many of Ofcom's large business sites will, in fact, have a very small number of employees. For example, the high street retail outlets of large national chains.
- Many SMEs[18] also use leased lines. Although the proportion using leased lines is far smaller than for larger businesses, in absolute terms there are many more SMEs than larger businesses. The geographic distribution of demand depends on the total number of sites requiring leased lines. It is certainly possible that the absolute number of sites used by SMEs requiring leased lines is greater than the number of large business sites. Either way, the inclusion of sites used by SMEs could result in a materially different distribution of potential leased line demand.

4.14 Clearly, there is a degree of uncertainty about the location of future demand. The buying patterns of leased lines change over time, and business move premises. Therefore, estimation of the future geographic distribution of demand is a difficult problem.

4.15 The simplest way to reduce the risk of errors in performing this estimation would be to supplement the current database of large business site locations with the existing locations of leased line demand. This would be simple for Ofcom to implement, and does not appear to have any disadvantages in terms of its effect on the analysis. Overall, we consider that it would produce a more robust assessment of network reach, and that this justifies the change in approach even if it only results in a small variation in the network reach metrics.

Reassess market boundaries

4.16 The outer boundary for the LP follows the WECLA from the 2013 BCMR. Ofcom's rationale for maintaining the old boundary is to ensure some stability in the regulatory regime. There have been no significant changes in network infrastructure since the last review, and no material changes in the geographic distribution of demand, and so we would not expect the market boundary to change.

4.17 Whilst we agree with the need for regulatory certainty, we consider that this would be best achieved by maintaining a consistent methodology rather than using the results of previous

[17] 2013 data from 'UKBD01 Enterprise/local units by Employment size band and GB Local Authority Districts (including UK total)'. The figure for sites refers to 'local units' which are defined as follows:

"A local unit is a statistical unit in an enterprise, defined as the individual site (shop, factory, etc) situated in a geographically identified place. At a local unit, economic activity is carried out by one or more persons (even if only part-time) working for one and the same enterprise."

[18] That is, businesses with less than 250 employees.

analyses based on outdated assumption and input data. Ofcom has revised and improved its data collection and analysis methods in a number of regards since the last review. Therefore, even if the market boundary only changed very slightly under the new approach, we would expect the revised boundary to be a better representation of the geographic differences in competitive conditions. On the basis of the diagrams presented in Ofcom's earlier data analysis consultation,[19] some change in the boundary would appear to be highly likely.

4.18 The reassessment of this boundary will give greater confidence in the results and reduce regulatory uncertainty. The absence of an update raises the question of when Ofcom will deem an update to be justified - how much of a difference in the proposed boundary will be needed before Ofcom decides to reassess the evidence? It would be much simpler, and more transparent, to recalculate the boundary using the latest data, methodology and assumptions.

4.19 Separately, we consider that the revised boundary should be assessed using the shorter dig distance assumptions that have been adopted in the CLA.

[19] See, for example, figure 4. "Business Connectivity Market Review, Consultation on Data Analysis", Ofcom, 8th October 2014.